Appendix 3: Details of Included Studies

3.1 Characteristics of Included Studies

First Author, Year	Study Design	Province(s)	Health Sector(s)	Setting	Sample Size	Patient Population (Sex & Age)
Aaron, 2017	Prospective cohort	Ontario; Alberta; British Columbia; Manitoba; Nova Scotia; Quebec	Acute or Specialty	Hospital (n=10)	n=203	Sex: 64 (31.5%) Male, 139 (68.5%) Female Age: Mean = 52.5, Other = 95% CI: 50.1 to 54.8
Aarts, 2012	Cross-sectional	Ontario	Acute or Specialty	Academic hospital (n=7)	n=336	Sex: 185 (55.4) Male, 149 (44.6) Female Age: Mean = 62.1
Abdul-Razzak, 2019	Retrospective cohort	Alberta	Home and Community; Acute or Specialty	Adult acute care centre (n=4); Community hospices (n=2); total n=6	n=14360	Not Specified
Ahmed, 2014	Cross-sectional	Quebec	Primary	Administrative database/Population dataset	n=18013	Sex: 6879 (38.7%) Male, 11035 (61.3%) Female Age: Mean = 38.3, SD = 21.8
Alghamdi, 2016	Cross-sectional	Alberta	Primary; Acute or Specialty	Administrative database/Population dataset	n=435	Sex: 435 (100%) Male Age: 43-95 years, Median = 72
Alkhiari, 2018	Retrospective cohort	Ontario	Acute or Specialty	Academic hospital (n=2)	n=19	Sex: 9 (47.4%) Male, 10 (52.6%) Female Age: Mean = 67.5, SD = 11.3
Allin, 2013	Cross-sectional	Ontario	Acute or Specialty	Hospital - BMD scanning facilities (n=54)	n=48	Sex: 12 (25%) Male, 36 (75%) Female Age: Mean = 67.2, SD = 10.9
Andrade, 2020	Case series	Ontario	Primary	Primary care practices (n=5)	n=280	Sex: 131 (47%) Male, 149 (53%) Female Age: up to 72 months
Andrew, 2018	Non-controlled before and after study	Nova Scotia	Long-term	Long-term care facilities (n=10)	n=159	Sex: 45 (28.3%) Male, 114 (71.7%) Female Age: Mean = 85.7, SD = 10.7

First Author, Year	Study Design	Province(s)	Health Sector(s)	Setting	Sample Size	Patient Population (Sex & Age)
Arbel, 2016	Interrupted time series	Ontario	Acute or Specialty	Hospital (n=19)	n=12318	Not Specified
Assmus, 2019	Retrospective cohort	Alberta	Primary; Acute or Specialty	Hospital/Specific setting data	n=400	Sex: 138 (34%) Male, 262 (66%) Female Age: 19-102 years, Mean = 59
Bainey, 2019	Retrospective cohort	Alberta	Acute or Specialty	Hospital	Not Specified	Not Specified
Banihashemi, 2009	Cross-sectional	Ontario; Alberta; British Columbia; Saskatchewan; New Brunswick; Newfoundland and Labrador; Quebec	Acute or Specialty	Hospital (no sample number); patient sample for timeframe: n=2213	n=2213	Sex: 1441 (65.1%) Male, 772 (34.9%) Female Age: Mean = 67.41, SD = 13
Barker, 2018	Retrospective cohort	Ontario	Primary; Acute or Specialty; Rehabilitation; Long-term	Administrative database/Population dataset	n=26259	Sex: 12287 (46.8%) Male, 13972 (53.2%) Female Age: Mean = 58.65
Barkun, 2013	Cluster randomized trial	Ontario; Alberta; British Columbia; Manitoba; Saskatchewan; New Brunswick; Newfoundland and Labrador; Nova Scotia, Prince Edward Island	Acute or Specialty	Hospital (n=43)	n=424	Sex: 274 (64.6%) Male, 150 (35.4%) Female Age: Mean = 66.3, SD = 15.7
Baselyous, 2019	Cross-sectional	Unidentified	Primary; Acute or Specialty; Rehabilitation; Long-term	Administrative database/Population dataset	n=2274	Sex: 694 (30.5%) Male, 1580 (69.5%) Female Age: Mean = 39, SD = 6.3
Beauséjour, 2015	Cross-sectional	Quebec	Primary; Acute or Specialty	Outpatient pediatric orthopedic clinics (n=5)	n=327	Sex: 79 (24.2%) Male, 248 (75.8%) Female Age: Mean = 14.02, SD = 1.94

First Author, Year	Study Design	Province(s)	Health Sector(s)	Setting	Sample Size	Patient Population (Sex & Age)
Bellai-Dussault, 2020	Retrospective cohort	Ontario	Home and Community; Primary; Acute or Specialty; Rehabilitation	Administrative database/Population dataset	n=23,845	Not Specified
Bello, 2019	Cross-sectional	Unidentified	Primary	Primary care	n=46162	Sex: 20307 (44%) Male, 25855 (56%) Female Age: Mean = 69.2, SD = 14
Bernier, 2018	Cross-sectional	Alberta	Acute or Specialty	Administrative database/Population dataset	n=1300	Sex: 1027 (79%) Male, 273 (21%) Female Age: Mean = 63.8
Beyea, 2018	Cross-sectional	Ontario	Acute or Specialty	Hospital (no sample number)	Not Specified	Not Specified
Bhatia (a), 2017	Retrospective cohort	Ontario	Primary	Administrative database/Population dataset	n=3629859	Sex: 1480987 (40.8%) Male, 2148872 (59.2%) Female Age: Mean = 39.1
Bhatia (b), 2017	Randomized Control Trial	Ontario	Acute or Specialty	Large academic medical centres; rural hospital; total sample n=7	Not Specified	Not Specified
Bhatt, 2018	Prospective cohort	Ontario; Alberta; Nova Scotia; Quebec	Acute or Specialty	Pediatric emergency departments (n=6)	n=6183	Sex: 4124 (66.7%) Male, 2059 (33.3%) Female Age: Median = 8, IQR = 4.0-12.0
Birk-Urovitz, 2017	Cross-sectional	Ontario	Acute or Specialty	Tertiary hospital (n=1); Community-based hospital (n=1)	n=205	Sex: 77 (37.6%) Male, 128 (62.4%) Female Age: 18-96 years, Mean = 54.5
Bisch, 2018	Non-controlled before and after study	Alberta	Acute or Specialty	Tertiary referral centres (n=2)	n=367	Age: Median = 57, IQR = 50-66
Bischof, 2015	Retrospective cohort	Ontario	Acute or Specialty	Cancer centres (n=2)	n=50	Sex: 25 (50%) Male, 25 (50%) Female Age: SD = 13.6, Median = 57

First Author, Year	Study Design	Province(s)	Health Sector(s)	Setting	Sample Size	Patient Population (Sex & Age)
Black, 2018	Cross-sectional	Nova Scotia	Acute or Specialty	Community-based hospitals; academic hospitals; total n=12, specific sample of each not specified	n=458	Sex: 221 (48.2%) Male, 223 (50.9%) Female Age: <16-65+ (NOTE: 50% were <65 yrs) years
Bonafide, 2020	Cross-sectional	Ontario; Alberta; British Columbia; Manitoba; Saskatchewan; New Brunswick; Newfoundland and Labrador; Nova Scotia	Acute or Specialty	Hospital (56 total; 2 Canadian)	n=94	Age: 8 weeks - 23 months
Booth, 2018	Cross-sectional	Ontario	Acute or Specialty	Administrative database/Population dataset	n=1306	Not Specified
Bouck, 2018	Cross-sectional	Ontario	Primary	Primary care practices (n=677)	n=1709206	Not Specified
Bouck, 2019	Cross-sectional	Ontario; Alberta; Saskatchewan; New Brunswick; Newfoundland and Labrador; Nova Scotia; Quebec	Primary; Acute or Specialty; Rehabilitation; Long-term; Public health	Administrative database/Population dataset	Patients having low-risk surgical procedures: n=527691; Mammography: n=2393200; Total sample: n=97740	Sex: Total sample: 46167 (47.2%), Mammography: 2393200 (100%) Female; Total sample: 51573 (52.8%) Female Age: Patients having low-risk surgical procedures: 18+; Mammography: 40-49; Total sample: 18+ years
Bowker, 2017	Retrospective cohort	Alberta	Home and Community; Primary; Acute or Specialty; Public health	Administrative database/Population dataset	n=16857	Sex: 16857 (100%) Female Age: Mean = 33.2, Other = 40.8% were 35+
Brimble, 2020	Prospective cohort	Ontario	Acute or Specialty	Community-based hospital; academic hospital; total n=2	n=419	Sex: 222 (53%) Male, 197 (47%) Female Age: Mean = 64.1, SD = 17.2

First Author, Year	Study Design	Province(s)	Health Sector(s)	Setting	Sample Size	Patient Population (Sex & Age)
Brown, 2017	Cross-sectional	Manitoba	Primary	Primary care (no sample provided)	Statins - drugs unknown: n=10237	Sex: Statins - drugs unknown: 5607 (54.8%) Male, Statins - drugs unknown: 4630 (45.2%) Female Age: Other = Statins - drugs unknown: 75+: 5374 (52%)
Brundage, 2013	Cross-sectional	Ontario; Alberta;British Columbia; Saskatchewan; New Brunswick; Nova Scotia; Prince Edward Island; Quebec	Acute or Specialty	Radiotherapy cancer centres (n=32)	n=649	Age: 44-87 years, Mean = 70.2
Canadian Institute for Health Information, 2009	Cross-sectional	Ontario; Alberta;British Columbia; Manitoba; Saskatchewan; New Brunswick; Newfoundland and Labrador; Nova Scotia; Prince Edward Island; Quebec; Northwest Territories; Yukon	Primary; Acute or Specialty; Rehabilitation; Long-term; Public health	Administrative database/Population dataset	n=3769	Age: 18+ years
Canadian Institute for Health Information, 2011	Cross-sectional	Ontario; Alberta;British Columbia; Manitoba; Saskatchewan; New Brunswick; Newfoundland and Labrador; Nova Scotia; Prince Edward Island; Quebec; Northwest Territories; Nunavut; Yukon	Unidentified	Administrative database/Population dataset	Not Specified	Not Specified

First Author, Year	Study Design	Province(s)	Health Sector(s)	Setting	Sample Size	Patient Population (Sex & Age)
Canadian Institute for Health Information, 2014	Cross-sectional	Ontario; Alberta; British Columbia; Manitoba; Saskatchewan; New Brunswick; Nova Scotia; Prince Edward Island	Unidentified	Administrative database/Population dataset	n=518622	Sex: 232343 (44.8%) Male, 286279 (55.2%) Female Age: 65+ years
Canadian Institute for Health Information, 2017	Cross-sectional	Ontario; Alberta; British Columbia; Manitoba; Saskatchewan; New Brunswick; Newfoundland and Labrador; Nova Scotia; Prince Edward Island; Quebec; Northwest Territories; Nunavut; Yukon	Unidentified	Emergency departments; Acute hospitals (no sample number); Ambulatory care in tertiary care hospitals (no sample number); Primary care; Not applicable (databases)	Not Specified	Sex: 100% Female
Canadian Institute for Health Information, 2018	Cross-sectional	Ontario; Saskatchewan; Newfoundland and Labrador; Nova Scotia; Prince Edward Island; Quebec	Unidentified	Administrative database/Population dataset	Not Specified	Not Specified
Canadian Partnership Against Cancer, 2017	Cross-sectional	Ontario; Alberta; British Columbia; Manitoba; Saskatchewan; New Brunswick; Newfoundland and Labrador; Nova Scotia; Prince Edward Island;	Public health	Administrative database/Population dataset	Not Specified	Not Specified

First Author, Year	Study Design	Province(s)	Health Sector(s)	Setting	Sample Size	Patient Population (Sex & Age)
		Quebec; Northwest Territories; Yukon				
Chan, 2018	Retrospective cohort	Ontario	Acute or Specialty	Administrative database/Population dataset	n=4149	Sex: 2711 (65.3%) Male, 1438 (34.7%) Female Age: Mean = 51.8, SD = 12.8, Median = 12.8, IQR = 44-61
Chen, 2019	Retrospective cohort	Alberta	Unidentified	Administrative database/Population dataset	n=219488	Sex: 131502 (60%) Male, 87986 (40%) Female Age: Mean = 64, SD = 13.8
Cheng, 2019	Retrospective cohort	Ontario	Acute or Specialty	Cancer centre (n=4)	n=198	Sex: 198 (100%) Male Age: Mean = 74.1, SD = 9.5
Chin, 2016	Cross-sectional	Alberta	Acute or Specialty	Hospitals (no sample number-data pulled from database)	n=200	Sex: 149 (74.5%) Male, 51 (25.5%) Female Age: 26.3-61.3 years, Median = 47.9
Clemens, 2016	Cross-sectional	Ontario	Unidentified	Administrative database/Population dataset	n=144252* (includes data from 2004-2013) n=1108378 (patient visits, 2007 - 2013)	Not Specified
Cohen, 2019	Cross-sectional	Ontario	Acute or Specialty	Pediatric emergency departments (n=4)	n=203075	Sex: 108014 (46.8%) Male, 95061 (53.2%) Female Age: Mean = 5.9, SD = 5.34, Median = 4.0
Daley, 2018	Randomized control trial	Newfoundland and Labrador	Acute or Specialty	Tertiary care-academic hospital (n=2)	n=55	Sex: 19 (34.5%) Male, 36 (64.5%) Female Age: Mean = 68.6, SD = 16
De Silva, 2018	Interrupted time series	Ontario; Quebec	Acute or Specialty	Tertiary perinatal centres (n=11); Neonatal Intensive Care Units (NICUs) (n=31)	n=3143	Sex: , 3143 (100%) Female Age: Median = 31, IQR = 27-35

First Author, Year	Study Design	Province(s)	Health Sector(s)	Setting	Sample Size	Patient Population (Sex & Age)
Diamant, 2019	Cross-sectional	British Columbia	Acute or Specialty	Hospital (n=2)	n=370	Sex: 260 (70.3%) Male, 110 (29.7%) Female Age: Mean = 66.2, SD = 16.2
Donovan, 2016	Retrospective cohort	Alberta	Acute or Specialty	Administrative database/Population dataset	n=86842	Sex: 86842 (100%) Female Age: Mean = 27.5, SD = 5.4
Eddy, 2013	Cross-sectional	British Columbia	Acute or Specialty	Hospital (n=37)	Not Specified	Not Specified
Elegbede, 2020	Retrospective cohort	Alberta	Acute or Specialty	Tertiary hospital; tertiary cancer centre	n=360	Sex: 155 (43%) Male, 205 (57%) Female Age: SD = 10, Median = 67
Emery, 2013	Cross-sectional	Ontario; Alberta	Acute or Specialty	Tertiary hospitals (n=2)	Not Specified	Not Specified
Eskicioiglu, 2015	Non-controlled before and after study	Ontario	Acute or Specialty	Academic hospital (n=6)	n=111	Sex: 57 (51.4%) Male, 54 (48.6%) Female Age: Mean = 58.1, SD = 17.9
Falk, 2019	Retrospective cohort	Manitoba	Unidentified	Administrative database/Population dataset	Not Specified	Not Specified
Ferguson, 2019	Retrospective cohort	Alberta	Home and Community; Primary; Acute or Specialty; Rehabilitation	Tertiary hospital; emergency departments; community health centers (CHCs) (n=3)	n=510	Sex: 252 (49.4%) Male, 258 (50.6%) Female Age: Mean = 61.6
Findlay, 2010	Cross-sectional	Alberta	Primary	Referrals from primary care physicians and specialists to neurosurgeons)	n=303	Sex: 172 (56.8%) Male, 131 (43.2%) Female Age: Mean = 55

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Gagnon, 2020	Cross-sectional	Quebec	Home and Community; Primary; Acute or Specialty; Rehabilitation; Long-term	Administrative database/Population dataset	n=286962	Sex: 146344 (51%) Male, 140618 (49%) Female Age: Mean = 76.4, SD = 7.1
Gasmi, 2017	Cross-sectional	Quebec	Primary	Administrative database/Population dataset	Not Specified	Not Specified
Gill, 2017	Cross-sectional	Alberta	Primary; Acute or Specialty; Rehabilitation; Long-term; Public health	Administrative database/Population dataset	n=543951	Sex: 195822 (36%) Male, 348129 (64%) Female Age: 0-108 years
Gotto, 2015	Retrospective cohort	Alberta	Acute or Specialty	Administrative database/Population dataset	n=315	Sex: 239 (75.9%) Male, 76 (24.1%) Female Age: 41-91 years, Median = 68.5
Gotto, 2016	Retrospective cohort	Alberta	Acute or Specialty	Administrative database/Population dataset	n=600	Sex: 482 (80.3%) Male, 118 (19.7%) Female Age: 33-98 years, Median = 74
Greenberg, 2016	Cross-sectional	Ontario	Acute or Specialty	Academic hospital (n=8)	n=248	Sex: 127 (51.2%) Male, 121 (48.8%) Female Age: 22-97 years, Mean = 59.8
Greiver, 2020	Retrospective cohort	Ontario	Home and Community; Primary; Acute or Specialty; Rehabilitation; Long-term	Administrative database/Population dataset	n=7363	Sex: 3595 (48.8%) Male, 3768 (51.2%) Female Age: Mean = 76.1, SD = 7.33, Median = 75.0, IQR = 70-81

First Author, Year	Study Design	Province(s)	Health Sector(s)	Setting	Sample Size	Patient Population (Sex & Age)
Gupta, 2012	Cross-sectional	Ontario; Alberta; British Columbia; Manitoba; Saskatchewan; New Brunswick; Newfoundland and Labrador; Nova Scotia	Acute or Specialty	Level 3 Neonatal Intensive Care Units (NICUs) (n=23)	7/23 centres (30.4% of total respondents)	Age: less than 30 weeks gestational age
Guttmann, 2011	Cross-sectional	Ontario	Primary; Acute or Specialty	Primary care clinics; Outpatient specialist clinics (15 Ontario LHIN, exact number of each not specified)	Not Specified	Not Specified
Hall (a), 2017	Retrospective cohort	Ontario	Acute or Specialty	Acute hospital (n=100)	n=18870	Sex: 9605 (50.9%) Male, 9265 (49.1%) Female Age: Average of Medians: 75.3
Hall (b), 2017	Retrospective cohort	Ontario	Acute or Specialty	Hospital (n=170)	Not Specified	Not Specified
Hall, 2010	Retrospective cohort	Ontario	Acute or Specialty	Hospital (n=63)	n=15514	Sex: 7641 (49.3%) Male, 7873 (50.7%) Female Age: Mean = 72.8, Median = 76.0, IQR = 65-83
Hall, 2012	Retrospective cohort	Ontario	Acute or Specialty	Tertiary hospital (no sample number)	n=15524	Sex: 7643 (49.2%) Male, 7881 (50.8%) Female Age: Mean = 73.1, SD = 13.9
Hall, 2015	Retrospective cohort	Ontario	Acute or Specialty	Acute hospital (14 Ontario LHINs, exact number of hospitals not specified)	Not Specified	Not Specified

First Author, Year	Study Design	Province(s)	Health Sector(s)	Setting	Sample Size	Patient Population (Sex & Age)
Harmouch, 2018	Cross-sectional	Ontario; British Columbia; Nova Scotia; Quebec	Acute or Specialty	Academic hospital (n=5)	n=530	Sex: 311 (58.7%) Male, 215 (40.6%) Female Age: Mean = 54.4, Median = 56.0, IQR = 46-63
Harris, 2013	Non-controlled before and after study	Ontario	Primary	Primary health care teams (no sample number)	n=998	Sex: 508 (50.9%) Male, 490 (49.1%) Female Age: 21-98 years, Mean = 65.1, SD = 12.1
Hayward, 2020	Non-controlled before and after study	Ontario; Alberta; British Columbia; Manitoba; Newfoundland and Labrador; Quebec	Home and Community; Primary	First Nations Communities	n=2008	Sex: 860 (42.8%) Male, 1148 (57.2%) Female Age: Mean = 60.5, SD = 14.6
Health Quality Ontario, 2011	Cross-sectional	Ontario	Primary; Acute or Specialty	Primary care; Acute care (no sample numbers)	Not Specified	Not Specified
Henderson, 2020	Interrupted time series	Ontario	Home and Community; Primary; Acute or Specialty; Rehabilitation; Long-term	Administrative database/Population dataset	Vitamin D: n=9571350; T3: n=344948	Sex: Vitamin D: 4621569 (48.3%) Male; T3: n=64725 (18.8%) Male, Vitamin D: 4949781 (51.7%) Female; T3: 280223 (81.2%) Female Age: 18-64 years
Hinther, 2016	Cross-sectional	Alberta	Acute or Specialty	Administrative database/Population dataset	n=195	Sex: 119 (61%) Male, 76 (39%) Female Age: 27.7-91.3 years, Mean = 61.5, SD = 13.9
Ho, 2017	Retrospective cohort	Ontario	Acute or Specialty	Hospitals (n=42)	n=1238	Sex: 922 (74.5%) Male, 316 (25.5%) Female Age: Mean = 59.9, SD = 15.3
Hsu, 2020	Retrospective cohort	Ontario	Home and Community; Primary; Acute or Specialty;	Administrative database/Population dataset	n=26259	Sex: 12287 (46.8%) Male, 13972 (53.2%) Female Age: Mean = 58.8

First Author, Year	Study Design	Province(s)	Health Sector(s)	Setting	Sample Size	Patient Population (Sex & Age)
			Rehabilitation; Long-term			
Iaboni, 2019	Cross-sectional	Ontario	Home and Community; Primary; Acute or Specialty; Rehabilitation; Long-term	Administrative database/Population dataset	n=76254	Sex: 22416 (29.4%) Male, 53838 (70.6%) Female Age: Other = Less than or equal to 85 years: n=35409 (46.4%); Greater than 85 years: n=40845 (53.6%)
Irfan, 2015	Interrupted time series	Ontario	Acute or Specialty	Tertiary hospital (n=2)	n=160	Sex: 46 (28.8%) Male, 114 (71.2%) Female Age: Mean = 72.6, SD = 14.2
Kahn, 2012	Retrospective cohort	Ontario; Alberta; British Columbia; Quebec	Acute or Specialty	Tertiary hospitals; Community-based hospitals; total n=12 (not specified how many of each)	n=868	Sex: 467 (53.8%) Male, 401 (46.2%) Female Age: Mean = 55.7, SD = 16.85
Kandalam, 2020	Cross-sectional	Alberta	Acute or Specialty	ER or Inpatient Encounter	Not Specified	Not Specified
Kapral, 2011	Cross-sectional	Ontario	Acute or Specialty	Acute care institutions (n=142)	n=3931	Sex: 1954 (49.7%) Male, 1977 (50.3%) Female
Keller, 2019	Interrupted time series	Ontario; Alberta; Saskatchewan; Quebec	Acute or Specialty	Hospital (n=5)	n=546	Not Specified
Khadilkar, 2014	Cross-sectional	Ontario; Alberta; British Columbia; Manitoba; Saskatchewan; Newfoundland and Labrador	Home and Community; Primary	Canadian Force Bases (n=14)	n=400	Sex: 383 (95.7%) Male, 17 (4.3%) Female Age: 18-60 years, Mean = 46.2, SD = 6.3
Khoury, 2019	Non-controlled before and after study	Unidentified	Primary	Family Health Teams (n=9); Individual	n= 139	Not Specified

First Author, Year	Study Design	Province(s)	Health Sector(s)	Setting	Sample Size	Patient Population (Sex & Age)
				Practice Physicians (n=10)		
Kirkham, 2015	Cross-sectional	Ontario	Acute or Specialty	Administrative database/Population dataset	n=2224070	Sex: 1003584 (54.9%) Male, 1220486 (45.1%) Female Age: Mean = 61.6, SD = 15.6
Kirkham, 2016	Cross-sectional	Ontario	Acute or Specialty	Hospital (n=119)	n=400058	Sex: 184541 (46.1%) Male, 215517 (53.9%) Female Age: Mean = 67.7, SD = 14.3
Kirkham, 2020	Stepped wedge RCT	Unidentified	Long-term	Administrative database/Population dataset	Not Specified	Not Specified
Kurdyak, 2017	Retrospective cohort	Ontario	Primary; Acute or Specialty; Rehabilitation; Long-term	Administrative database/Population dataset	n=1105116	Sex: 574738 (52%) Male, 530378 (48%) Female Age: Mean = 62.36, SD = 14.3
Lake, 2020	Retrospective cohort	Ontario	Home and Community; Primary; Acute or Specialty; Rehabilitation; Long-term	Long term care (LTC) facilities (n=10)	n=7136	Not Specified
Landry, 2011	Cross-sectional	Nova Scotia	Primary	Family physicians (sample number not specified)	Not Specified	Not Specified
Lee, 2011	Retrospective cohort	Ontario	Acute or Specialty	Hospital (n=10)	n=4638	Not Specified
Liddy, 2012	Cross-sectional	Ontario	Primary	Primary care practices (n=84)	n=5292	Sex: 2586 (48.9%) Male, 2706 (51.1%) Female Age: Mean = 66, SD = 12

First Author, Year	Study Design	Province(s)	Health Sector(s)	Setting	Sample Size	Patient Population (Sex & Age)
Ma, 2017	Interrupted time series	Alberta	Primary; Acute or Specialty	Hospitals; Community clinics (databases)	Not Specified	Not Specified
Maclagan, 2017	Retrospective cohort	Ontario	Long-term	Nursing homes (database)	n=41351	Sex: 14603 (35.3%) Male, 26748 (64.7%) Female Age: 65-85+ years
MacMillan, 2018	Interrupted time series	Ontario	Acute or Specialty; Rehabilitation	Acute care hospitals (n=3); Rehabilitation hospitals (n=3); total n=6	Not Specified	Not Specified
Marin, 2020	Cross-sectional	British Columbia	Home and Community; Acute or Specialty	27 community hemodialysis units and 13 hospital based hemodialysis units; total n=40 units	n=3017	Sex: 1824 (60.5%) Male, 1193 (39.5%) Female Age: Mean = 66.2, SD = 14.8
Martel, 2018	Retrospective cohort	Quebec	Acute or Specialty	Academic hospital (n=2)	n=201	Sex: 201 (100%) Female Age: <40-79 years
Martin, 2015	Non-controlled before and after study	Ontario	Acute or Specialty	Tertiary hospital (n=2)	n=128	Sex: 74 (57.8%) Male, 54 (42.2%) Female Age: Mean = 63.4
Martin, 2018	Non-controlled before and after study	Alberta	Acute or Specialty	Hospital (n=6)	n=487	Sex: 264 (54%) Male, 222 (46%) Female Age: 18-100 years, Mean = 62.4, SD = 13.7
Martin, 2019	Cluster randomized trial	Quebec	Primary	Community pharmacies (n=69)	n=241	Sex: 72 (29.9%) Male, 169 (70.1%) Female Age: 66-95 years, Mean = 74.8, SD = 6.3
McAlister, 2018	Cross-sectional	Alberta	Primary; Acute or Specialty; Rehabilitation;	Administrative database/Population dataset	n=162143	Age: 18+ years

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			Long-term; Public health			
McBride, 2019	Retrospective cohort	Ontario; British Columbia; Manitoba; Nova Scotia	Acute or Specialty	Cancer centre; Hospitals (sample number of each unknown; patient samples provided for each province included)	n=238461	Age: Average IQR = 50-69, Average of Medians = 60
McCracken, 2017	Cross-sectional	British Columbia	Long-term	Nursing home (n=6)	n=25	Not Specified
McDonald, 2011	Cross-sectional	Ontario	Primary	Family medicine clinic (n=3); Midwifery clinic (n=2); Obstetrics clinic (n=4); total n=9	n=310	Sex: 310 (100%) Female Age: 23.8-35.2 years, Mean = 29.5
McDonald, 2012	Cross-sectional	Ontario	Primary	Outpatient clinics (sample not specified)	n=308	Sex: 308 (100%) Female Age: Mean = 29.6, SD = 5.6
McKenna, 2015	Cross-sectional	Alberta	Acute or Specialty	Rural teaching hospital (n=3)	n=266	Sex: 120 (45.1%) Male, 146 (54.9%) Female Age: Median = n=68, IQR = 58-77
McKinnon, 2019	Cross-sectional	Alberta; Newfoundland and Labrador; Nova Scotia	Acute or Specialty	Pediatric oncology centres (n=4)	n=204	Age: 44214 years, Median = 6
Minian, 2019	Cluster randomized trial	Unidentified	Home and Community; Primary	Family health teams; Community health centers (CHCs); Nurse practitioner-led clinics (NPLCs) (n=Total no. of control practices: n=92; Large FHT: n=15; Small FHT:	n=2799	Sex: 1548 (55%) Male, 1251 (45%) Female Age: Mean = 48.1, SD = 13.7

First Author, Year	Study Design	Province(s)	Health Sector(s)	Setting	Sample Size	Patient Population (Sex & Age)
				n=59; Large CHC: n=6; Small CHC n=22; Large NPLC: n=3; Small NPLC: n=6)		
Mohareb, 2015	Retrospective cohort	Ontario	Acute or Specialty	Tertiary hospitals (n=18)	n=48336	Sex: 28930 (59.9%) Male, 19406 (40.1%) Female Age: Mean = 63.06, SD = 11.01
Morgan, 2016	Cross-sectional	Ontario; Alberta; British Columbia; Manitoba; Saskatchewan; New Brunswick; Newfoundland and Labrador; Nova Scotia	Unidentified	Administrative database/Population dataset	n=1299260	Sex: 487643 (37.5%) Male, 811617 (62.5%) Female Age: 65+ years
Morgen, 2015	Retrospective cohort	Alberta	Home and Community; Primary; Acute or Specialty; Rehabilitation; Long-term; Public health	Administrative database/Population dataset	Not Specified	Not Specified
Olson, 2014	Cross-sectional	British Columbia	Acute or Specialty	Cancer centres (n=5)	n=8601	Sex: 4318 (50.2%) Male, 4283 (49.8%) Female Age: 5-104 years, Median = 70
Pai, 2013	Cluster randomized trial	Ontario	Acute or Specialty	Academic hospital; Small community hospital; Large community hospital; total n=6, not specified how many of each hospital	n=1457	Sex: 688 (47.2%) Male, 769 (52.8%) Female Age: 18-102 years, Median = 72

First Author, Year	Study Design	Province(s)	Health Sector(s)	Setting	Sample Size	Patient Population (Sex & Age)
Panju, 2011	Cross-sectional	Ontario	Acute or Specialty	Academic hospital (n=2)	n=762	Not Specified
Papastergiou, 2019	Case series	Ontario	Home and Community	community pharmacy (n=6)	n=100	Sex: 42 (42%) Male, 58 (58%) Female Age: Mean = 76.9, Other = greater than or equal 65 years: n=87
Pardhan, 2019	Retrospective cohort	Ontario	Acute or Specialty	Acute hospital (n=167)	n=18,028	Not Specified
Pasricha, 2018	Cross-sectional	Ontario	Unidentified	Administrative database/Population dataset	n=653993	Sex: 314463 (48.1%) Male, 339530 (51.9%) Female Age: Median = 48, IQR = 29-63
Pelletier, 2016	Retrospective cohort	Quebec	Primary; Acute or Specialty; Rehabilitation; Public health	Administrative database/Population dataset	n=29132	Sex: 21286 (73.1%) Male, 7846 (26.9%) Female Age: Mean = 56.4, SD = 5.7
Pendrith, 2017	Cross-sectional	Ontario	Primary	Primary care (details not specified by authors)	Full cohort-Imaging for low back pain: n=51929; Full cohort -Cervical cancer screening: n=1483962; Full cohort -Repeat Duel X-Ray Absorptiometry Scans (DEXA) more often than every 2 years: n=394314	Sex: Full cohort-Imaging for low back pain: 29279 (66.4%) Male; Full cohort-Repeat Duel X-Ray Absorptiometry Scans (DEXA) more often than every 2 years: 62116 (15.8%) Male, Full cohort-Imaging for low back pain: 22650 (43.6%) Female; Full cohort-Cervical cancer screening: 1483962 (100%) Female; Full cohort-Repeat Duel X-Ray Absorptiometry Scans (DEXA) more often than every 2 years: 332198 (84.2%) Female Age: Mean = Full cohort-Imaging for low back pain: 41.8; Full cohort-Repeat Duel X-Ray Absorptiometry Scans (DEXA) more often than every 2 years: 63.9, Other = Full cohort-Imaging for low back pain: 95% CI: 39.9-43.6; Full cohort-Cervical cancer screening: less than 21 years: n=729901 (49.2%); greater than 69: n=754061 (50.8%); Full

First Author, Year	Study Design	Province(s)	Health Sector(s)	Setting	Sample Size	Patient Population (Sex & Age)
						cohort-Repeat Duel X-Ray Absorptiometry Scans (DEXA) more often than every 2 years: 95% CI: 62.6-65.4
Plitt, 2016	Retrospective cohort	Alberta	Public health	Administrative database/Population dataset	n=99609	Sex: 99609 (100%) Female
Price, 2019	Prospective cohort	Ontario	Primary	Family health teams (n=3)	n=884	Sex: 246 (27.9%) Male, 638 (72.1%) Female Age: Mean = 46, SD = 17.5
Redwood, 2019	Retrospective cohort	Alberta	Acute or Specialty	Hospital (database)	n=372	Age: 20-79 years
Remfry, 2015	Cross-sectional	Ontario	Acute or Specialty	Academic hospital (n=3)	n=553	Sex: 296 (53.5%) Male, 257 (46.5%) Female Age: Mean = 67.3, SD = 16.3
Riddell, 2017	Cross-sectional	Ontario; Alberta; British Columbia	Acute or Specialty	Hospital (no sample number)	n=40842	Sex: 40842 Female Age: <25-35+ (64.7% between 25-34 years) years
Rigby, 2017	Cross-sectional	Nova Scotia	Unidentified	Administrative database/Population dataset	n=294	Sex: 158 (53.7%) Male, 136 (46.3%) Female Age: 66-80+ years
Roux, 2020	Cross-sectional	Unidentified	Home and Community; Primary; Acute or Specialty; Rehabilitation	Administrative database/Population dataset	n=1105295	Sex: 482118 (43.6%) Male, 623177 (56.4%) Female Age: Mean = 74.9, SD = 7.0, Median = 73.0, IQR = 69-80
Rowe, 2018	Prospective cohort	Alberta	Acute or Specialty	Academic hospital (n=1); Community hospital (n=2); total n=3	n=250	Sex: 119 (47.6%) Male, 131 (52%) Female Age: Median = 35, IQR = 23-49

First Author, Year	Study Design	Province(s)	Health Sector(s)	Setting	Sample Size	Patient Population (Sex & Age)
Sadatsafvi, 2017	Retrospective cohort	British Columbia	Unidentified	Administrative database/Population dataset	Not Specified	Not Specified
Sauro, 2019	Cross-sectional	Alberta	Acute or Specialty	Adult medical-surgical Intensive Care Units (n=9)	Adoption cohort: n=6467; De-adoption cohort: n=4931 Total sample: n = 6946	Sex: Adoption cohort: 2797 (56.7%) Male; De-adoption cohort: 3764 (58.2%) Male; Total sample: 4058 (58.4%) Male, Adoption cohort: 2134 (43.3%) Female; De-adoption cohort: 2703 (41.8%) Female; Total sample: 2888 (41.6%) Female Age: Median = Adoption cohort: 61; De-adoption cohort: 61; Total sample: 60, IQR = Adoption cohort: 47-71; De-adoption cohort; 46-71; Total: 46-71
Sawler, 2020	Retrospective cohort	Alberta	Acute or Specialty	Apheresis Centres (n=2)	n=61	Sex: 18 (30%) Male, 43 (70%) Female Age: Median = 40.6, IQR = 34.1-57.7
Scales, 2016	Stepped wedge RCT	Ontario	Acute or Specialty	Academic hospitals (n=4); Large community hospitals (n=14); total n=18	n=322	Sex: 209 (64.9%) Male, 113 (35.1%) Female Age: Mean = 67, SD = 16
Schuh, 2017	Retrospective cohort	Ontario; Alberta; British Columbia; Manitoba; Saskatchewan; Newfoundland and Labrador; Nova Scotia; Quebec	Acute or Specialty	Pediatric emergency departments (n=8)	n=802	Sex: 496 (62%) Male, 306 (38%) Female Age: Mean = 4.4 months, SD = 3.1
Scovil, 2019	Non-controlled before and after study	Ontario; Alberta; Quebec	Rehabilitation	Spinal cord injury (SCI) rehabilitation centres (n=6)	n=341	Sex: 249 (73%) Male, 92 (27%) Female
Sharma, 2019	Retrospective cohort	Unidentified	Home and Community	community pharmacies (n=All of Alberta-Number unknown)	n=547709	Sex: 255293 (46.6%) Male, 292396 (53.4%) Female Age: Over the age of 65 years = 468863 (18%)

First Author, Year	Study Design	Province(s)	Health Sector(s)	Setting	Sample Size	Patient Population (Sex & Age)
Shih, 2017	Retrospective cohort	Ontario	Acute or Specialty	Tertiary hospital (n=4)	n=138	Not Specified
Shurrab, 2017	Cross-sectional	Ontario	Long-term	Long-term care (LTC) facilities (n=25)	n=3378	Sex: 1985 (91%) Male, 293 (9%) Female Age: 80-94 years, Mean = 87
Siemens, 2020	Retrospective cohort	Unidentified	Acute or Specialty	Administrative database/Population dataset	n=1695	Not Specified
Silberberg, 2017	Retrospective cohort	Ontario; Alberta;British Columbia; Nova Scotia; Quebec	Primary	Primary care practices (not specified; provides number of patients (n=9495)- data from national chart audit networks)	n=9495	Sex: 5355 (56.4%) Male, 4140 (43.6%) Female Age: Median = 78, IQR = 70-83
Silverman, 2017	Cross-sectional	Ontario	Unidentified	Administrative database/Population dataset	n=185014	Sex: 79217 (42.8%) Male, 105797 (57.2%) Female Age: Mean = 74.6, SD = 6.9
Simos, 2015	Cross-sectional	Ontario	Acute or Specialty	Administrative database/Population dataset	n=13724	Sex: 13724 (100%) Female
Singer, 2018	Cross-sectional	Manitoba	Primary	Primary care clinics (n=32; 185 providers)	n=5745; Antimicrobial Prescriptions for Viral Diagnoses: n=134248	Age: Mean = Antimicrobial Prescriptions for Viral Diagnoses: 41.2, SD = Antimicrobial Prescriptions for Viral Diagnoses: 24.3
Skiffington, 2020	Retrospective cohort	Unidentified	Acute or Specialty	Hospital (n=121)	n=181738	Sex: 181738 (100%) Female Age: Mean = 27, SD = 5
Snodgrass, 2014	Non-controlled before and after study	Alberta	Primary; Acute or Specialty; Public health	Administrative database/Population dataset	Not Specified	Not Specified

First Author, Year	Study Design	Province(s)	Health Sector(s)	Setting	Sample Size	Patient Population (Sex & Age)
Solbak, 2018	Retrospective cohort	Alberta	Public health	Survey	n=9641	Sex: 3641 (37.8%) Male, 6000 (62.2%) Female Age: Mean = 61.18, SD = 6.36
Somanader, 2017	Prospective cohort	Ontario	Acute or Specialty	Community-based hospital; academic hospital; total n=3	n=411	Sex: 286 (69.6%) Male, 125 (30.4%) Female Age: Mean = 64.5, SD = 10.4
Soril, 2019	Retrospective cohort	Alberta	Acute or Specialty	Adult medical-surgical Intensive Care Units (n=9)	n=2287	Sex: 1240 (54.2%) Male, 1047 (45.8%) Female Age: Mean = 58.6, SD = 15.5
Spradbrow, 2016	Cross-sectional	Ontario	Acute or Specialty	Community-based hospital (n=5); Academic hospital (n=5); total n=10	n=345	Sex: 176 (51%) Male, 169 (49%) Female Age: 18-80+ years
Srigley, 2013	Cross-sectional	Ontario	Acute or Specialty	Tertiary hospitals (n=2)	n=124	Sex: 55 (44.4%) Male, 69 (55.6%) Female Age: 19-99 years, Mean = 69.8
Steinberg, 2020	Retrospective cohort	Unidentified	Acute or Specialty	Tertiary university centres (n=2)	n=803	Sex: 632 (79%) Male, 171 (21%) Female Age: 22-984 years, Median = 66
Sun, 2015	Interrupted time series	Ontario	Primary; Acute or Specialty; Rehabilitation	Administrative database/Population dataset	Not Specified	Not Specified
Symonds, 2018	Cross-sectional	Alberta	Primary; Acute or Specialty; Rehabilitation; Long-term; Public health	Administrative database/Population dataset	n=308485	Sex: 308485 (100%) Female Age: 15-20, 70+ years
Taggar, 2016	Cross-sectional	Alberta	Acute or Specialty	Administrative database/Population dataset	n=476	Sex: 476 (100%) Male Age: 35.9-84.2 years, Median = 61.6

First Author, Year	Study Design	Province(s)	Health Sector(s)	Setting	Sample Size	Patient Population (Sex & Age)
Teoh, 2013	Cross-sectional	Ontario; Alberta; British Columbia; Manitoba; Saskatchewan; New Brunswick; Newfoundland and Labrador; Nova Scotia	Primary	Primary care teams (n=9); Family doctors in traditional nonteam (solo) practices (n=88 physicians)	CVD Screening: n=427; Waist circumference: n=829; Statins-drug unknown: n=1404; Counselling-Nutrition: n=2461; Counselling-Exercise/Active Living: n=2461; Counselling-Smoking Cessation: n=109; Total sample: n = 2461	Sex: Total sample: 1223 (49.7%) Male, Total sample: 1238 (50.3%) Female Age: Median = 62, IQR = 54-70
Tharmaratnam, 2020	Retrospective cohort	Unidentified	Acute or Specialty	Academic hospital (n=8 (Canadian: n=7; United States: n=1))	n=35	Not Specified
Thomas, 2020	Cross-sectional	Alberta	Acute or Specialty	Acute care hospitals (n=4)	n=82935	Sex: 41069 (49.5%) Male, 41866 (50.5%) Female Age: Median = 75, IQR = 69-82
Tinmouth, 2013	Cross-sectional	Ontario	Acute or Specialty	Small community hospital (n=10); Large community hospital (n=39); Academic hospital (n=16); total n=65	Not Specified	Not Specified
Trenaman, 2018	Cross-sectional	Nova Scotia	Unidentified	Administrative database/Population dataset	n=523	Sex: 125 (23.9%) Male, 398 (76.1%) Female Age: 66 and older
Verma, 2020	Cross-sectional	Ontario	Acute or Specialty	large, urban, tertiary-care hospitals; teaching hospitals (n=5)	n=3479	Sex: 1612 (46%) Female Age: Mean = 65, SD = 18

First Author, Year	Study Design	Province(s)	Health Sector(s)	Setting	Sample Size	Patient Population (Sex & Age)
Vinturache, 2017	Prospective cohort	Alberta	Primary	Primary care offices (no sample number)	n=1996	Sex: 1996 (100%) Female Age: Other = ≤34 yrs old (n = 1579; 81%), ≥35 yrs old (n= 371; 19%)
Vinturache, 2019	Prospective cohort	Alberta	Primary	Primary care offices (no sample number)	n=2909	Sex: 2909 (100%) Female Age: Mean = 30.7, SD = 4.5
Vitale, 2020	Non-controlled before and after study	Unidentified	Primary	Primary care sites (8 family health teams; 2 family-medicine group practices; 1 solo physician practice). (n=11)	n=284	Sex: 151 (53.17%) Male, 133 (46.83%) Female Age: Mean = 61.71
Walker, 2020	Interrupted time series	Unidentified	Long-term	Long term care (LTC) facilities; Ontario's LTC homes who had at least one RAI-MDS assessment (n=635)	n=66817	Age: Mean (SD) Percentage <65 years = 6.5% (26.9%)
Wanis, 2013	Cross-sectional	Saskatchewan	Acute or Specialty	Hospital/Specific setting data	n=196	Sex: 21 (10.7%) Male, 175 (89.3%) Female Age: 19-94 years, Mean = 55
Weir, 2020	Prospective cohort	Quebec	Acute or Specialty	Hospital (4 medical and surgical study units) (n=2)	n=1576	Sex: 911 (57.8%) Male, 665 (42.2%) Female Age: Median = 76, IQR = 70-82
Welk, 2018	Interrupted time series	Ontario	Primary; Acute or Specialty; Rehabilitation; Long-term; Public health	Administrative database/Population dataset	Testosterone: n=2968; Ultrasound-Abd.: n=1515; Bone scan: n=5275	Sex: Testosterone: 2968 (100%) Male; Ultrasound-Abd.: 1515 (100%) Male; Bone scan: 5275 (100%) Male Age: Mean = Testosterone: 72.1; Ultrasound-Abd.: 3.7; Bone scan: 68.4, SD = Testosterone: 5.8; Ultrasound-Abd.: 4.4; Bone scan: 9.5
Welk, 2019	Interrupted time series	Ontario	Primary; Acute or Specialty; Rehabilitation;	Administrative database/Population dataset	Testosterone: n=2968; Ultrasound-Abd.:	Sex: Testosterone: 2968 (100%) Male; Ultrasound-Abd.: 1515 (100%) Male; Bone scan: 5275 (100%) Male Age: Mean = Testosterone: 72.1; Ultrasound-Abd.: 3.7; Bone scan: 68.4,

First Author, Year	Study Design	Province(s)	Health Sector(s)	Setting	Sample Size	Patient Population (Sex & Age)
			Long-term; Public health		n=1515; Bone scan: n=5275	SD = Testosterone: 5.8; Ultrasound-Abd.: 4.4; Bone scan: 9.5
Wintemute, 2019	Retrospective parallel cohort study	Ontario	Primary	Family health teams (n=6)	n=150994	Sex: 76176 (50.4%) Male, 74754 (49.5%) Female Age: 18+ years
Wirth, 2020	Cross-sectional	Saskatchewan	Acute or Specialty	Hospital (n=2)	n=222	Sex: 130 (58.6%) Male, 92 (41.4%) Female Age: Mean = 70.9, SD = 11.1
Wong, 2017	Cross-sectional	British Columbia	Acute or Specialty	Administrative database/Population dataset	n=802	Sex: 213 (26.6%) Male, 589 (73.4%) Female Age: 22-92 years, Median = 67

Appendix 3: Details of Included Studies

3.2 Inappropriate Care Reported in Included Studies

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
Aaron, 2017	Therapeutics (Medications)	Antileukotriene (Asthma)	Not explicitly stated in study. (from results, recommendation: patients without asthma should not be taking antileukotriene daily).	Global Initiative for Asthma. Global strategy for asthma management and prevention. 2016. http://www.ginasthma.org/. Accessed May 27, 2016. Reddel HK, Bateman ED, Becker A, et al. A summary of the new GINA strategy: a roadmap to asthma control. Eur Respir J. 2015;46(3):622-639. Lougheed MD, Lemiere C, Ducharme FM, et al; Canadian Thoracic Society Asthma Clinical Assembly. Canadian Thoracic Society 2012 guideline update: diagnosis and management of asthma in preschoolers, children and adults. Can Respir J. 2012;19(2):127-164. National Heart, Lung, and Blood Institute. National Asthma Education and Prevention Program expert panel report 3: guidelines for the diagnosis and management of asthma—summary report, 2007. http://www.nhlbi.nih.gov/files/docs/guidelines/asthsumm.pdf. Published October 2007. Accessed May 27, 2016.	Not specified (January 2012-February 2015)	Overuse (5.90%)
Aaron, 2017	Therapeutics (Medications)	Asthma Medications-medication(s) not specified (Asthma)	Contemporary asthma guidelines suggest stepping down asthma treatment once good asthma control has been achieved and maintained for 3 months.	Global Initiative for Asthma. Global strategy for asthma management and prevention. 2016. http://www.ginasthma.org/. Accessed May 27, 2016. Reddel HK, Bateman ED, Becker A, et al. A summary of the new GINA strategy: a roadmap to asthma control. Eur Respir J. 2015;46(3):622-639. Lougheed MD, Lemiere C, Ducharme FM, et al; Canadian Thoracic Society Asthma Clinical Assembly. Canadian Thoracic Society 2012 guideline update: diagnosis and management of asthma in	Not specified (January 2012-February 2015)	Overuse (79.30%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				preschoolers, children and adults. Can Respir J. 2012;19(2):127-164. National Heart, Lung, and Blood Institute. National Asthma Education and Prevention Program expert panel report 3: guidelines for the diagnosis and management of asthma—summary report, 2007. http://www.nhlbi.nih.gov/files/docs/guidelines/asthsumm.pdf. Published October 2007. Accessed May 27, 2016.		
Aaron, 2017	Therapeutics (Medications)	Corticosteroids-Inhaled-medication(s) not specified (Asthma)	Not explicitly stated in study. (from results, recommendation: patients without asthma should not be taking ICS (inhaled corticosteroid) or ICS with LABA (long-acting beta;-agonist bronchodilator).	Global Initiative for Asthma. Global strategy for asthma management and prevention. 2016. http://www.ginasthma.org/. Accessed May 27, 2016. Reddel HK, Bateman ED, Becker A, et al. A summary of the new GINA strategy: a roadmap to asthma control. Eur Respir J. 2015;46(3):622-639. Lougheed MD, Lemiere C, Ducharme FM, et al; Canadian Thoracic Society Asthma Clinical Assembly. Canadian Thoracic Society 2012 guideline update: diagnosis and management of asthma in preschoolers, children and adults. Can Respir J. 2012;19(2):127-164. National Heart, Lung, and Blood Institute. National Asthma Education and Prevention Program expert panel report 3: guidelines for the diagnosis and management of asthma—summary report, 2007. http://www.nhlbi.nih.gov/files/docs/guidelines/asthsumm.pdf. Published October 2007. Accessed May 27, 2016.	Not specified (January 2012-February 2015)	Overuse (33.50%)
Aaron, 2017	*Diagnostics (Multiple Diagnostics)*	Expiratory Airflow Assessment (spirometry, bronchial challenge testing, and/or serial peak	Guidelines recommend that tests of expiratory airflow (spirometry, bronchial challenge testing, or serial peak flow testing) are needed	Global Initiative for Asthma. Global strategy for asthma management and prevention. 2016. http://www.ginasthma.org/. Accessed May 27, 2016. Reddel HK, Bateman ED, Becker A, et al. A summary of the new GINA strategy: a roadmap to asthma control. Eur Respir J. 2015;46(3):622-639.	Not specified (January 2012-February 2015)	Underuse (50.30%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
		flow testing) (Asthma)	to confirm asthma diagnosis.	Lougheed MD, Lemiere C, Ducharme FM, et al; Canadian Thoracic Society Asthma Clinical Assembly. Canadian Thoracic Society 2012 guideline update: diagnosis and management of asthma in preschoolers, children and adults. Can Respir J. 2012;19(2):127-164. National Heart, Lung, and Blood Institute. National Asthma Education and Prevention Program expert panel report 3: guidelines for the diagnosis and management of asthma—summary report, 2007. http://www.nhlbi.nih.gov/files/docs/guidelines/asthsumm.pdf. Published October 2007. Accessed May 27, 2016.		
Aarts, 2012	Diagnostics (Assessments)	Anesthesia Preassessment (Colorectal Surgery)	Guidelines recommend that patients receive a preassessment by anesthesist prior to colorectal surgery in accordance to Enhanced Recovery After Surgery (ERAS) guidelines).	Adamina M, Kehlet H, Tomlinson GA, Senagore AJ, Delaney CP (2011) Enhanced recovery pathways optimize health outcomes and resource utilization: a meta-analysis of randomized controlled trials in colorectal surgery. Surgery 149:830–840 Fearon KC, Ljungqvist O, Von MM, Revhaug A, Dejong CH, Lassen K, Nygren J, Hausel J, Soop M, Andersen J, Kehlet H (2005) Enhanced recovery after surgery: a consensus review of clinical care for patients undergoing colonic resection. Clin Nutr 24:466–477 Lassen K, Soop M, Nygren J, Cox PB, Hendry PO, Spies C, von Meyenfeldt MF, Fearon KC, Revhaug A, Norderval S, Ljungqvist O, Lobo DN, Dejong CH (2009) Consensus review of optimal perioperative care in colorectal surgery: Enhanced Recovery After Surgery (ERAS) Group recommendations. Arch Surg 144:961–969	St. Joseph's Health Centre; Toronto General Hospital; Toronto Western Hospital; Mount Sinai Hospital; St. Michael's Hospital; Sunnybrook Health Science Centre; Toronto East General Hospital (July 1, 2008-June 30, 2009)	Underuse (22.60%)
Aarts, 2012	Therapeutics (Biophysical Therapy)	Bowel Preparation (Colorectal Surgery)	Not explicitly stated in study; (from results, recommendation: patients undergoing	Adamina M, Kehlet H, Tomlinson GA, Senagore AJ, Delaney CP (2011) Enhanced recovery pathways optimize health outcomes and resource utilization: a	St. Joseph's Health Centre; Toronto General	Overuse (32.40%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
			colorectal surgery should not receive bowel preparation in accordance to Enhanced Recovery After Surgery (ERAS) guidelines).	meta-analysis of randomized controlled trials in colorectal surgery. Surgery 149:830–840 Fearon KC, Ljungqvist O, Von MM, Revhaug A, Dejong CH, Lassen K, Nygren J, Hausel J, Soop M, Andersen J, Kehlet H (2005) Enhanced recovery after surgery: a consensus review of clinical care for patients undergoing colonic resection. Clin Nutr 24:466–477 Lassen K, Soop M, Nygren J, Cox PB, Hendry PO, Spies C, von Meyenfeldt MF, Fearon KC, Revhaug A, Norderval S, Ljungqvist O, Lobo DN, Dejong CH (2009) Consensus review of optimal perioperative care in colorectal surgery: Enhanced Recovery After Surgery (ERAS) Group recommendations. Arch Surg 144:961–969	Hospital; Toronto Western Hospital; Mount Sinai Hospital; St. Michael's Hospital; Sunnybrook Health Science Centre; Toronto East General Hospital (July 1, 2008-June 30, 2009)	
Aarts, 2012	Therapeutics (Psychosocial Therapy)	Counselling-Preoperative (Colorectal surgery)	Enhanced recovery after surgery (ERAS) programs in colorectal surgery include patient education and preparation, preservation of gut function, minimization of organ dysfunction, minimization of pain and discomfort, and promotion of patient autonomy. Specifically, guidelines recommend preoperative counselling before colorectal surgery.	Adamina M, Kehlet H, Tomlinson GA, Senagore AJ, Delaney CP (2011) Enhanced recovery pathways optimize health outcomes and resource utilization: a meta-analysis of randomized controlled trials in colorectal surgery. Surgery 149:830–840 Fearon KC, Ljungqvist O, Von MM, Revhaug A, Dejong CH, Lassen K, Nygren J, Hausel J, Soop M, Andersen J, Kehlet H (2005) Enhanced recovery after surgery: a consensus review of clinical care for patients undergoing colonic resection. Clin Nutr 24:466–477 Lassen K, Soop M, Nygren J, Cox PB, Hendry PO, Spies C, von Meyenfeldt MF, Fearon KC, Revhaug A, Norderval S, Ljungqvist O, Lobo DN, Dejong CH (2009) Consensus review of optimal perioperative care in colorectal surgery: Enhanced Recovery After Surgery (ERAS) Group recommendations. Arch Surg 144:961–969	St. Joseph's Health Centre; Toronto General Hospital; Toronto Western Hospital; Mount Sinai Hospital; St. Michael's Hospital; Sunnybrook Health Science Centre; Toronto East General Hospital (July 1, 2008-June 30, 2009)	Underuse (58.60%)
Aarts, 2012	Therapeutics (Medications)	Domperidone (Antiemetic)	Not explicitly stated in study; (from results,	Adamina M, Kehlet H, Tomlinson GA, Senagore AJ, Delaney CP (2011) Enhanced recovery pathways	St. Joseph's Health Centre;	Underuse (100.00%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
		(Colorectal Surgery)	recommendation: patients should receive probiotics before colorectal surgery in accordance to Enhanced Recovery After Surgery (ERAS) guidelines).	optimize health outcomes and resource utilization: a meta-analysis of randomized controlled trials in colorectal surgery. Surgery 149:830–840 Fearon KC, Ljungqvist O, Von MM, Revhaug A, Dejong CH, Lassen K, Nygren J, Hausel J, Soop M, Andersen J, Kehlet H (2005) Enhanced recovery after surgery: a consensus review of clinical care for patients undergoing colonic resection. Clin Nutr 24:466–477 Lassen K, Soop M, Nygren J, Cox PB, Hendry PO, Spies C, von Meyenfeldt MF, Fearon KC, Revhaug A, Norderval S, Ljungqvist O, Lobo DN, Dejong CH (2009) Consensus review of optimal perioperative care in colorectal surgery: Enhanced Recovery After Surgery (ERAS) Group recommendations. Arch Surg 144:961–969	Toronto General Hospital; Toronto Western Hospital; Mount Sinai Hospital; St. Michael's Hospital; Sunnybrook Health Science Centre; Toronto East General Hospital (July 1, 2008-June 30, 2009)	
Aarts, 2012	Therapeutics (Medications)	Epidural (Colorectal surgery)	Not explicitly stated in study; (from results, recommendation: patients should receive an epidural after colorectal surgery in accordance to Enhanced Recovery After Surgery (ERAS) guidelines).	Adamina M, Kehlet H, Tomlinson GA, Senagore AJ, Delaney CP (2011) Enhanced recovery pathways optimize health outcomes and resource utilization: a meta-analysis of randomized controlled trials in colorectal surgery. Surgery 149:830–840 Fearon KC, Ljungqvist O, Von MM, Revhaug A, Dejong CH, Lassen K, Nygren J, Hausel J, Soop M, Andersen J, Kehlet H (2005) Enhanced recovery after surgery: a consensus review of clinical care for patients undergoing colonic resection. Clin Nutr 24:466–477 Lassen K, Soop M, Nygren J, Cox PB, Hendry PO, Spies C, von Meyenfeldt MF, Fearon KC, Revhaug A, Norderval S, Ljungqvist O, Lobo DN, Dejong CH (2009) Consensus review of optimal perioperative care in colorectal surgery: Enhanced Recovery After Surgery (ERAS) Group recommendations. Arch Surg 144:961–969	St. Joseph's Health Centre; Toronto General Hospital; Toronto Western Hospital; Mount Sinai Hospital; St. Michael's Hospital; Sunnybrook Health Science Centre; Toronto East General Hospital (July 1, 2008-June 30, 2009)	Underuse (76.80%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
Aarts, 2012	Therapeutics (Medications)	Magnesium Hydroxide (Colorectal Surgery)	Not explicitly stated in study; (from results recommendation patients should receive magnesium hydroxide after colorectal surgery in accordance to Enhanced Recovery After Surgery (ERAS) guidelines).	Adamina M, Kehlet H, Tomlinson GA, Senagore AJ, Delaney CP (2011) Enhanced recovery pathways optimize health outcomes and resource utilization: a meta-analysis of randomized controlled trials in colorectal surgery. Surgery 149:830–840 Fearon KC, Ljungqvist O, Von MM, Revhaug A, Dejong CH, Lassen K, Nygren J, Hausel J, Soop M, Andersen J, Kehlet H (2005) Enhanced recovery after surgery: a consensus review of clinical care for patients undergoing colonic resection. Clin Nutr 24:466–477 Lassen K, Soop M, Nygren J, Cox PB, Hendry PO, Spies C, von Meyenfeldt MF, Fearon KC, Revhaug A, Norderval S, Ljungqvist O, Lobo DN, Dejong CH (2009) Consensus review of optimal perioperative care in colorectal surgery: Enhanced Recovery After Surgery (ERAS) Group recommendations. Arch Surg 144:961–969	St. Joseph's Health Centre; Toronto General Hospital; Toronto Western Hospital; Mount Sinai Hospital; St. Michael's Hospital; Sunnybrook Health Science Centre; Toronto East General Hospital (July 1, 2008-June 30, 2009)	Underuse (98.80%)
Aarts, 2012	Therapeutics (Biophysical Therapy)	Nasogastric tube (Colorectal Surgery)	Not explicitly stated in study; (from results, recommendation: patients should not receive an NG tube during colorectal surgery in accordance to Enhanced Recovery After Surgery (ERAS) guidelines).	Adamina M, Kehlet H, Tomlinson GA, Senagore AJ, Delaney CP (2011) Enhanced recovery pathways optimize health outcomes and resource utilization: a meta-analysis of randomized controlled trials in colorectal surgery. Surgery 149:830–840 Fearon KC, Ljungqvist O, Von MM, Revhaug A, Dejong CH, Lassen K, Nygren J, Hausel J, Soop M, Andersen J, Kehlet H (2005) Enhanced recovery after surgery: a consensus review of clinical care for patients undergoing colonic resection. Clin Nutr 24:466–477 Lassen K, Soop M, Nygren J, Cox PB, Hendry PO, Spies C, von Meyenfeldt MF, Fearon KC, Revhaug A, Norderval S, Ljungqvist O, Lobo DN, Dejong CH (2009) Consensus review of optimal perioperative care in colorectal surgery: Enhanced Recovery After Surgery (ERAS) Group recommendations. Arch Surg 144:961–969	St. Joseph's Health Centre; Toronto General Hospital; Toronto Western Hospital; Mount Sinai Hospital; St. Michael's Hospital; Sunnybrook Health Science Centre; Toronto East General Hospital (July	Overuse (7.40%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
					1, 2008-June 30, 2009)	
Aarts, 2012	Therapeutics (Medications)	Nonsteroidal Anti-inflammatory Drugs (Colorectal Surgery)	Not explicitly stated in study; (from results, recommendation: patients should receive NSAIDs after colorectal surgery in accordance to Enhanced Recovery After Surgery (ERAS) guidelines).	Adamina M, Kehlet H, Tomlinson GA, Senagore AJ, Delaney CP (2011) Enhanced recovery pathways optimize health outcomes and resource utilization: a meta-analysis of randomized controlled trials in colorectal surgery. Surgery 149:830–840 Fearon KC, Ljungqvist O, Von MM, Revhaug A, Dejong CH, Lassen K, Nygren J, Hausel J, Soop M, Andersen J, Kehlet H (2005) Enhanced recovery after surgery: a consensus review of clinical care for patients undergoing colonic resection. Clin Nutr 24:466–477 Lassen K, Soop M, Nygren J, Cox PB, Hendry PO, Spies C, von Meyenfeldt MF, Fearon KC, Revhaug A, Norderval S, Ljungqvist O, Lobo DN, Dejong CH (2009) Consensus review of optimal perioperative care in colorectal surgery: Enhanced Recovery After Surgery (ERAS) Group recommendations. Arch Surg 144:961–969	St. Joseph's Health Centre; Toronto General Hospital; Toronto Western Hospital; Mount Sinai Hospital; St. Michael's Hospital; Sunnybrook Health Science Centre; Toronto East General Hospital (July 1, 2008-June 30, 2009)	Underuse (65.20%)
Aarts, 2012	Therapeutics (Biophysical Therapy)	Nutrition-Clear Fluids (Colorectal Surgery)	Not explicitly stated in study; (from results, recommendation: patients should receive clear fluids on day of colorectal surgery in accordance to Enhanced Recovery After Surgery (ERAS) guidelines).	Adamina M, Kehlet H, Tomlinson GA, Senagore AJ, Delaney CP (2011) Enhanced recovery pathways optimize health outcomes and resource utilization: a meta-analysis of randomized controlled trials in colorectal surgery. Surgery 149:830–840 Fearon KC, Ljungqvist O, Von MM, Revhaug A, Dejong CH, Lassen K, Nygren J, Hausel J, Soop M, Andersen J, Kehlet H (2005) Enhanced recovery after surgery: a consensus review of clinical care for patients undergoing colonic resection. Clin Nutr 24:466–477 Lassen K, Soop M, Nygren J, Cox PB, Hendry PO, Spies C, von Meyenfeldt MF, Fearon KC, Revhaug A, Norderval S, Ljungqvist O, Lobo DN, Dejong CH (2009) Consensus review of optimal perioperative care in colorectal surgery: Enhanced Recovery After	St. Joseph's Health Centre; Toronto General Hospital; Toronto Western Hospital; Mount Sinai Hospital; St. Michael's Hospital; Sunnybrook Health Science Centre; Toronto East General	Underuse (58.30%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				Surgery (ERAS) Group recommendations. Arch Surg 144:961–969	Hospital (July 1, 2008-June 30, 2009)	
Aarts, 2012	Therapeutics (Biophysical Therapy)	Nutrition-Liquid Calorie Supplement (Colorectal surgery)	Not explicitly stated in study; (from results, recommendation: patients should receive a liquid calorie supplement after colorectal surgery in accordance to Enhanced Recovery After Surgery (ERAS) guidelines).	Adamina M, Kehlet H, Tomlinson GA, Senagore AJ, Delaney CP (2011) Enhanced recovery pathways optimize health outcomes and resource utilization: a meta-analysis of randomized controlled trials in colorectal surgery. Surgery 149:830–840 Fearon KC, Ljungqvist O, Von MM, Revhaug A, Dejong CH, Lassen K, Nygren J, Hausel J, Soop M, Andersen J, Kehlet H (2005) Enhanced recovery after surgery: a consensus review of clinical care for patients undergoing colonic resection. Clin Nutr 24:466–477 Lassen K, Soop M, Nygren J, Cox PB, Hendry PO, Spies C, von Meyenfeldt MF, Fearon KC, Revhaug A, Norderval S, Ljungqvist O, Lobo DN, Dejong CH (2009) Consensus review of optimal perioperative care in colorectal surgery: Enhanced Recovery After Surgery (ERAS) Group recommendations. Arch Surg 144:961–969	St. Joseph's Health Centre; Toronto General Hospital; Toronto Western Hospital; Mount Sinai Hospital; St. Michael's Hospital; Sunnybrook Health Science Centre; Toronto East General Hospital (July 1, 2008-June 30, 2009)	Underuse (98.80%)
Aarts, 2012	Therapeutics (Biophysical Therapy)	Post-operative - Foley Catheter (Colorectal Surgery)	Not explicitly stated in study; (from results, recommendation: a patient's foley catheter should be removed 24 hours after colon surgery in accordance to Enhanced Recovery After Surgery (ERAS) guidelines).	Adamina M, Kehlet H, Tomlinson GA, Senagore AJ, Delaney CP (2011) Enhanced recovery pathways optimize health outcomes and resource utilization: a meta-analysis of randomized controlled trials in colorectal surgery. Surgery 149:830–840 Fearon KC, Ljungqvist O, Von MM, Revhaug A, Dejong CH, Lassen K, Nygren J, Hausel J, Soop M, Andersen J, Kehlet H (2005) Enhanced recovery after surgery: a consensus review of clinical care for patients undergoing colonic resection. Clin Nutr 24:466–477 Lassen K, Soop M, Nygren J, Cox PB, Hendry PO, Spies C, von Meyenfeldt MF, Fearon KC, Revhaug A, Norderval S, Ljungqvist O, Lobo DN, Dejong CH (2009) Consensus review of optimal perioperative	St. Joseph's Health Centre; Toronto General Hospital; Toronto Western Hospital; Mount Sinai Hospital; St. Michael's Hospital; Sunnybrook Health Science Centre; Toronto East	Underuse (42.90%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				care in colorectal surgery: Enhanced Recovery After Surgery (ERAS) Group recommendations. Arch Surg 144:961–969	General Hospital (July 1, 2008-June 30, 2009)	
Aarts, 2012	Therapeutics (Biophysical Therapy)	Postoperative Mobilization (Colorectal Surgery)	Not explicitly stated in study; (from results, recommendation: patients undergoing colorectal surgery should be mobilized in accordance to Enhanced Recovery After Surgery (ERAS) guidelines).	Adamina M, Kehlet H, Tomlinson GA, Senagore AJ, Delaney CP (2011) Enhanced recovery pathways optimize health outcomes and resource utilization: a meta-analysis of randomized controlled trials in colorectal surgery. Surgery 149:830–840 Fearon KC, Ljungqvist O, Von MM, Revhaug A, Dejong CH, Lassen K, Nygren J, Hausel J, Soop M, Andersen J, Kehlet H (2005) Enhanced recovery after surgery: a consensus review of clinical care for patients undergoing colonic resection. Clin Nutr 24:466–477 Lassen K, Soop M, Nygren J, Cox PB, Hendry PO, Spies C, von Meyenfeldt MF, Fearon KC, Revhaug A, Norderval S, Ljungqvist O, Lobo DN, Dejong CH (2009) Consensus review of optimal perioperative care in colorectal surgery: Enhanced Recovery After Surgery (ERAS) Group recommendations. Arch Surg 144:961–969	St. Joseph's Health Centre; Toronto General Hospital; Toronto Western Hospital; Mount Sinai Hospital; St. Michael's Hospital; Sunnybrook Health Science Centre; Toronto East General Hospital (July 1, 2008-June 30, 2009)	Underuse (90.20%)
Aarts, 2012	Therapeutics (Biophysical Therapy)	Preoperative Fasting (Colorectal Surgery)	Not explicitly stated in study; (from results, recommendation: patients undergoing colorectal surgery should fast greater than 3 hours preoperatively in accordance to Enhanced Recovery After Surgery (ERAS) guidelines).	Adamina M, Kehlet H, Tomlinson GA, Senagore AJ, Delaney CP (2011) Enhanced recovery pathways optimize health outcomes and resource utilization: a meta-analysis of randomized controlled trials in colorectal surgery. Surgery 149:830–840 Fearon KC, Ljungqvist O, Von MM, Revhaug A, Dejong CH, Lassen K, Nygren J, Hausel J, Soop M, Andersen J, Kehlet H (2005) Enhanced recovery after surgery: a consensus review of clinical care for patients undergoing colonic resection. Clin Nutr 24:466–477 Lassen K, Soop M, Nygren J, Cox PB, Hendry PO, Spies C, von Meyenfeldt MF, Fearon KC, Revhaug A, Norderval S, Ljungqvist O, Lobo DN, Dejong CH	St. Joseph's Health Centre; Toronto General Hospital; Toronto Western Hospital; Mount Sinai Hospital; St. Michael's Hospital; Sunnybrook Health Science Centre;	Underuse (91.70%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				(2009) Consensus review of optimal perioperative care in colorectal surgery: Enhanced Recovery After Surgery (ERAS) Group recommendations. Arch Surg 144:961–969	Toronto East General Hospital (July 1, 2008-June 30, 2009)	
Aarts, 2012	Therapeutics (Medications)	Probiotics (Colorectal Surgery)	Not explicitly stated in study; (from results, recommendation: patients should receive domperidone as an antiemetic after colorectal surgery in accordance to Enhanced Recovery After Surgery (ERAS) guidelines).	Adamina M, Kehlet H, Tomlinson GA, Senagore AJ, Delaney CP (2011) Enhanced recovery pathways optimize health outcomes and resource utilization: a meta-analysis of randomized controlled trials in colorectal surgery. Surgery 149:830–840 Fearon KC, Ljungqvist O, Von MM, Revhaug A, Dejong CH, Lassen K, Nygren J, Hausel J, Soop M, Andersen J, Kehlet H (2005) Enhanced recovery after surgery: a consensus review of clinical care for patients undergoing colonic resection. Clin Nutr 24:466–477 Lassen K, Soop M, Nygren J, Cox PB, Hendry PO, Spies C, von Meyenfeldt MF, Fearon KC, Revhaug A, Norderval S, Ljungqvist O, Lobo DN, Dejong CH (2009) Consensus review of optimal perioperative care in colorectal surgery: Enhanced Recovery After Surgery (ERAS) Group recommendations. Arch Surg 144:961–969	St. Joseph's Health Centre; Toronto General Hospital; Toronto Western Hospital; Mount Sinai Hospital; St. Michael's Hospital; Sunnybrook Health Science Centre; Toronto East General Hospital (July 1, 2008-June 30, 2009)	Underuse (100.00%)
Abdul-Razzak, 2019	Therapeutics (Medications)	Continuous Midazolam Infusion (Palliative Sedation)	Guidelines recommend the use of pharmacologic agents (e.g., continuous midazolam infusion) with the primary aim of reducing consciousness and limiting use to cases of refractory and intolerable suffering in patients with advanced progressive illness—more explicitly patients in the last two weeks of life.	Dean M, Cellarius V, Henry B, et al.: Framework for continuous palliative sedation therapy in Canada. J Palliat Med 2012; 8:870–876. Maltoni M, Scarpi E, Rosati M, et al: Palliative sedation in end-of-life care and survival: A systematic review. J Clin Oncol 2012; 12:1378–1383. Schildmann EK, Shildmann J, Kiesewetter I, et al.: Medication and monitoring in palliative sedation therapy: A systematic review and quality assessment of published guidelines. J Pain Symptom Manage 2015; 49:734–746.	Not specified (February 1, 2007- January 31, 2015)	Underuse (95.80%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				Braun TC, Hagen NA, Clark T: Development of a clinical practice guideline for palliative sedation. J Palliat Med 2003; 6:345–350.		
Ahmed, 2014	Therapeutics (Medications)	Short-acting Beta-Agonists (SABA) (Asthma)	Recommendations are categorised based on control status. For individuals in control, recommendations generated are one of three categories: maintain treatment, decrease treatment or maintain or decrease treatment. Recommendations also include options for action plan prescriptions for patients who are in control. For individuals who were not well controlled, recommendations are either to increase treatment or to refer to a specialist. Within each recommendation category, physicians are presented with specific recommendations for medications and doses to achieve the desired level of drug treatment.	Lemiere C, Bai T, Balter M, et al. Adult Asthma Consensus Guidelines update 2003. Can Respir J 2004;11(Suppl A):9A–18A Becker A, Lemiere C, Berube D, et al. Summary of recommendations from the Canadian Asthma Consensus guidelines, 2003. CMAJ 2005;173(Suppl 6):S3–11. Schatz M, Zeiger RS, Vollmer WM, et al. Validation of a beta-agonist long-term asthma control scale derived from computerized pharmacy data. J Allergy Clin Immunol 2006; 117:995–1000."	RAMQ beneficiary demographic database; prescription claims database; medical services claims database (March 15, 2018)	Underuse (87.60%)
Ahmed, 2014	Therapeutics (Medications)	Short-acting Beta-Agonists-medication(s) not specified (Asthma)	Asthma control is determined based on the overuse of short-acting B agonists (SABA) and visits to the emergency department (ED) for a respiratory problem	Lemiere C, Bai T, Balter M, et al. Adult Asthma Consensus Guidelines update 2003. Can Respir J 2004;11(Suppl A):9A–18A Becker A, Lemiere C, Berube D, et al. Summary of recommendations from the Canadian Asthma	RAMQ beneficiary demographic database; prescription claims database;	Overuse (3.20%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
			over a 3-month period before the index date. Based on a previously validated algorithm, a patient is considered to be not well controlled if the sum of the quantity of all SABA medications dispensed to the patient within the past 3 months exceeds 250 doses and/or they visited an ED for a respiratory-related problem in the past 3 months. Only asthma drugs that were (1) prescribed and dispensed within 1 year of the index date and (2) active (i.e., based on prescription algorithms, it is likely that the person has a supply of the medication) or expired within 30 days prior to the index date were considered when generating the recommendations.	Consensus guidelines, 2003. CMAJ 2005;173(Suppl 6): S3–11. Schatz M, Zeiger RS, Vollmer WM, et al. Validation of a beta-agonist long-term asthma control scale derived from computerized pharmacy data. J Allergy Clin Immunol 2006; 117:995–1000."	medical services claims database (March 15, 2018)	
Alghamdi, 2016	Therapeutics (Acute care procedures)	Early Repeat Resection (Prostate Cancer)	Recommended treatment for patients with high-risk prostate cancer (HR-Pca) is RT + ADT.	Alberta Health Services. Prostate Cancer Guideline. http://www.albertahealthservices.ca/assets/info/hp/cancer/if-hp-cancer-guide-gu004-prostate.pdf. Accessed November 12, 2016.	Alberta Cancer Registry (January 1, 2012-December 31, 2012)	Underuse (51.50%)
Alghamdi, 2016	Diagnostics (Referrals)	Radiation Oncologist (Prostate Cancer)	Patients with High-risk prostate cancer (HR-Pca) be referred to a radiation oncologist	Alberta Health Services. Prostate Cancer Guideline. http://www.albertahealthservices.ca/assets/info/hp/cancer/if-hp-cancer-guide-gu004-prostate.pdf. Accessed November 12, 2016.	Alberta Cancer Registry (January 1,	Underuse (57.00%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
			(RO) prior to a radical prostatectomy (RP) and that the preferred treatment is RT + ADT.		2012-December 31, 2012)	
Alghamdi, 2016	Therapeutics (Acute care procedures)	Radical Prostatectomy (Prostate Cancer)	Recommended that patients with high-risk prostate cancer (HR-Pca) receive a radical prostatectomy (recommended by a radiation oncologist).	Alberta Health Services. Prostate Cancer Guideline. http://www.albertahealthservices.ca/assets/info/hp/cancer/if-hp-cancer-guide-gu004-prostate.pdf. Accessed November 12, 2016.	Alberta Cancer Registry (January 1, 2012-December 31, 2012)	Underuse (83.00%)
Alkhiari, 2018	Therapeutics (Medications)	Antihyperglycemics (Diabetes Mellitus)	Continued management of Type 2 Diabetes in hospital (e.g., oral antihyperglycemic agents or insulin regimens).	Houlden R, Capes S, Clement M, Miller D, et al. Canadian Diabetes Association 2013 Clinical Practice Guidelines for the Prevention and Management of Diabetes in Canada: In-Hospital Management of Diabetes. Can J Diabetes 2013;37: S77–81.	Not specified (October 2014-December 2014)	Underuse (18.00%)
Allin, 2013	Diagnostics (Assessments)	Fracture Risk Assessment (Fragility Fractures)	Recommendations suggest that all baseline reports include a diagnostic category for fragility fractures.	Lentle B, Cheung AM, Hanley DA, Leslie WD, Lyons D, Papaioannou A, Atkinson S, Brown JP, Feldman S, Hodsman AB, Jamal AS, Josse RG, Kaiser SM, Kvern B, Morin S, Siminoski (2011) Osteoporosis Canada 2010 Guidelines for the Assessment of Fracture Risk. Can Assoc Radiol J 62:243–250	National Ambulatory Care Reporting System database (January 2007-October 2008)	Underuse (22.90%)
Andrade, 2020	Diagnostics (Screening)	Nutrition (Hospitalized patients)	Ontario's Food and Nutrition Strategy recommends that children be screened using the NutriSTEP® screening tool. NutriSTEP is also recommended as a tool for primary care providers' use in the routine assessment of children's healthy eating behaviours as noted in the Primary	Ontario Food and Nutrition Strategy Group. Ontario Food and Nutrition Strategy: a comprehensive evidenceinformed plan for healthy food and food systems in Ontario. Toronto (ON): Ontario Food and Nutrition Strategy Group; 2017. 112 p. Registered Nurses' Association of Ontario. Primary prevention of childhood obesity. 2nd ed. Toronto (ON): Registered Nurses' Association of Ontario; 2014. 144 p. Dietitians of Canada and Canadian Paediatric Society. A health professional's guide for using the WHO growth charts for Canada. 2014. 14 p.	Accuro digital EMR software (June 20, 2016 -July 7, 2017)	Underuse (29.60%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
			Prevention of Childhood Obesity clinical practice guidelines.			
Andrew, 2018	*Therapeutics (Multiple medication results)*	Potentially Inappropriate Medications-medications not specified (Studies of Potentially Inappropriate Medications)	Appropriateness of medications was determined using the 2012 Beers Criteria Update. The Beers Criteria are an example of 'explicit' classification of medication appropriateness.	Hajjar ER, Cafiero AC, Hanlon JT. Polypharmacy in elderly patients. Am J Geriatr Pharmacother 2007; 5: 345–351. American Geriatrics Society 2012 Beers Criteria Update Expert Panel. American Geriatrics Society updated Beers Criteria for potentially inappropriate medication use in older adults. J Am Geriatr Soc 2012; 60: 616–631.	Not specified (September 1, 2008-January 28, 2009)	Overuse (86.20%)
Arbel, 2016	Therapeutics (Acute care procedures)	Angiography (CVD)	Recommended that patients with stable Coronary Artery Disease (CAD) do not receive a diagnostic angiography.	Patel MR, Bailey SR, Bonow RO, et al. ACCF/SCAI/AATS/AHA/ASE/ASNC/HFSA/HRS/SCCM/SCCT/SCMR/STS 2012 appropriate use criteria for diagnostic catheterization: a report of the American College of Cardiology Foundation Appropriate Use Criteria Task Force, Society for Cardiovascular Angiography and Interventions, American Association for Thoracic Surgery, American Heart Association, American Society of Echocardiography, American Society of Nuclear Cardiology, Heart Failure Society of America, Heart Rhythm Society, Society of Critical Care Medicine, Society of Cardiovascular Computed Tomography, Society for Cardiovascular Magnetic Resonance, and Society of Thoracic Surgeons. J Am Coll Cardiol 2012;59(22):1995-2027. [PubMed PMID: 22578925. Epub 2012/05/15. eng].	Cardiac Care Network clinical registry (January 1, 2013-October 31, 2013)	Overuse (16.00%)
Assmus, 2019	Therapeutics (Acute care procedures)	Cystoscopy (Asymptomatic Microscopic Hematuria)	Cystoscopy is performed on patients >40 years old or with a positive/atypical urine cytology.6 In patients ≤40 years old, only those with risk factors for urothelial	Wollin T, Laroche B, Psooy K. Canadian guidelines for the management of asymptomatic microscopic hematuria in adults. Can Urol Assoc J 2009;3:77-80. https://doi.org/10.5489/cuaj.1029 Kassouf W, Aprikian A, Black P, et al. Recommendations for the improvement of bladder cancer quality of care in Canada: A consensus document reviewed and endorsed by Bladder Cancer	Research Electronic Data Capture tool hosted at the University of Alberta (June 2010 - June 2016)	Overuse (57.10%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
			malignancy should proceed to cystoscopy.	Canada (BCC), Canadian Urologic Oncology Group (CUOG), and Canadian Urological Association (CUA), December 2015. Can Urol Assoc J 2016;10:E46-80. https://doi.org/10.5489/cuaj.3583 Davis R, Jones JS, Barocas DA, et al. Diagnosis, evaluation and follow-up of asymptomatic microhematuria (AMH) in adults: AUA guideline 2012. Available at: www.auanet.org. Accessed Dec. 30, 2017		
Bainey, 2019	Diagnostics (Imaging)	Non-invasive Cardiac Imaging (CVD)	According to guidelines, the following Non-invasive Cardiac Tests (NICTs) were not provided to patients with acute coronary syndrome (ACS): exercise stress test (EST), pharmacologic stress test (PST), echocardiography (ECHO), cardiac myocardial perfusion imaging (MPI), cardiac magnetic resonance imaging (MRI); and/or cardiac computed tomography (CT).	Ibanez B, James S, Agewall S, et al. 2017 ESC Guidelines for the management of acute myocardial infarction in patients presenting with STsegment elevation. Eur Heart J 2018; 39:119-77. Roffi M, Patrono C, Collet J-P, et al. 2015 ESC Guidelines for the management of acute coronary syndromes in patients presenting without persistent ST-segment elevation. Eur Heart J 2016; 37:267-315. Amsterdam EA, Wenger NK, Brindis RG, et al. 2014 AHA/ACC guideline for the management of patients with non-ST-elevation acute coronary syndromes: a report of the American College of Cardiology/ American Heart Association Task Force on Practice Guidelines. J Am Coll Cardiol 2014;64: e139-228. O'Gara PT, Kushner FG, Ascheim DD, et al. 2013 ACCF/AHA guideline for the management of ST-elevation myocardial infarction: executive summary. J Am Coll Cardiol 2013; 61:485-510.	the Discharge Abstract Database; the National Ambulatory Care Reporting System database; the Alberta Health Care Insurance Registry (April 1, 2004 - March 31, 2016)	Underuse (37.50%)
Banihashemi, 2009	Therapeutics (Medications)	Antiplatelet Therapy (CVD)	Conservative approach to antiplatelet therapy (for patients with Acute Coronary Syndrome): To give a class IA treatment recommendation for the use of clopidogrel OR	Anderson JL, Adams CD, Antman EM, et al. ACC/AHA 2007 guidelines for the management of patients with unstable angina/ non–ST-elevation myocardial infarction: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines. J Am Coll Cardiol 2007;50: e1-e157.	GlobalRegistry of Acute Coronary Events in Canada (January 1, 2007-	Underuse (35.70%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
			glycoprotein (GP) IIb/IIIa inhibitors in patients with NSTE-ACS managed conservatively.		December 31, 2007)	
Banihashemi, 2009	Therapeutics (Medications)	Antiplatelet Therapy (CVD)	Invasive approach to antiplatelet therapy (for patients with Acute Coronary Syndrome): To give a class IIA recommendation for the use of the combination (clopidogrel AND Glycoprotein (GP) IIb/IIIa inhibitors) in patients selected to undergo an invasive strategy.	Anderson JL, Adams CD, Antman EM, et al. ACC/AHA 2007 guidelines for the management of patients with unstable angina/ non–ST-elevation myocardial infarction: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines. J Am Coll Cardiol 2007;50: e1-e157.	Global Registry of Acute Coronary Events in Canada (January 1, 2007-December 31, 2007)	Underuse (14.80%)
Barker, 2018	Diagnostics (Assessments)	Eye exams (Diabetes Mellitus)	Eye exam recommended every 1-2 years for patients with Type II Diabetes.	Canadian Diabetes Association. 2013 Clinical practice guidelines for the prevention and management of diabetes in Canada. Can J Diabetes 2013;37: S1–S212 Supplement 1.	Institute for Clinical Evaluative Sciences; Registered Persons Database; Canadian Institute for Health Information Discharge Abstract Database; Ontario Mental Health Reporting System; National Ambulatory Care Reporting System (April	Underuse (43.20%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
					1, 2011-March 31, 2013)	
Barker, 2018	Diagnostics (Blood tests)	Glycated Hemoglobin (HbA1c) (Diabetes Mellitus)	At least four hemoglobin A1c (HbA1c) tests completed during the 2-year observation study period.	Canadian Diabetes Association. 2013 Clinical practice guidelines for the prevention and management of diabetes in Canada. Can J Diabetes 2013;37: S1–S212 Supplement 1.	Institute for Clinical Evaluative Sciences; Registered Persons Database; Canadian Institute for Health Information Discharge Abstract Database; Ontario Mental Health Reporting System; National Ambulatory Care Reporting System (April 1, 2011-March 31, 2013)	Underuse (64.20%)
Barker, 2018	Diagnostics (Multiple Blood Tests)	Lipids (Various tests - e.g., total cholesterol, HDL, LDL, triglycerides) (Diabetes Mellitus)	At least one dyslipidemia test was performed during the 2-year observation period.	Canadian Diabetes Association. 2013 Clinical practice guidelines for the prevention and management of diabetes in Canada. Can J Diabetes 2013;37:S1–S212 Supplement 1.	Institute for Clinical Evaluative Sciences; Registered Persons Database; Canadian Institute for Health Information Discharge	Underuse (27.60%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
					Abstract Database; Ontario Mental Health Reporting System; National Ambulatory Care Reporting System (April 1, 2011-March 31, 2013)	
Barkun, 2013	*Multiple Therapeutics*	Endoscopic Hemostasis PLUS High-dose IV Proton Pump Inhibitor (Upper Gastrointestinal Bleeding)	Recommended that patients with bleeding ulcers who exhibit high-risk stigmata (active bleeding, visible vessel and adherent clots) should be treated endoscopically with injection followed by thermal therapy. Thereafter, should receive intravenous proton pump inhibitors (PPI) for a correct indication at a correct dosage (high-dose pantoprazole [80 mg bolus] followed within 6 h by 8 mg/h for a total of 72 h [both ± 12 h]) following successful endoscopic therapy (endoscopic therapy criterion to include hemostasis using either thermal coagulation or	Barkun A, Bardou M, Marshall JK. Consensus recommendations for managing patients with nonvariceal upper gastrointestinal bleeding. Ann Intern Med 2003; 139:843-57. Bensoussan K, Fallone CA, Barkun AN, et al. A sampling of Canadian practice in managing nonvariceal upper gastrointestinal bleeding before recent guideline publication: Is there room for improvement? Can J Gastroenterol 2005; 19:487-95. Barkun AN, Bardou M, Kuipers EJ, et al. International consensus recommendations on the management of patients with nonvariceal upper gastrointestinal bleeding. Ann Intern Med 2010; 152:101. Barkun A, Fallone CA, Chiba N, et al. A Canadian clinical practice algorithm for the management of patients with nonvariceal upper gastrointestinal bleeding. Can J Gastroenterol 2004; 18:605-9.	Not specified (December 2007-February 2009)	Underuse (92.90%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
			the application of clips alone).			
Baselyous, 2019	*Therapeutics (Multiple medication results)*	Potentially Inappropriate Medications-Nonsteroidal Anti-inflammatory Drugs, Selective Serotonin Reuptake Inhibitors, Serotonin-Norepinephrine Reuptake Inhibitors, Antiplatelets or Anticoagulants, Oral Corticosteroids, Alendronate, ACE-Inhibitors, Angiotensin II Receptor Blockers, Diuretics and/or Beta Blockers (Studies of Potentially Inappropriate Medications)	According to the Australian Medicines Handbook and the Australian Therapeutic Guidelines, gastrointestinal disorders System Organ Class (SOC) included concomitant medications which may potentiate the risk of gastrointestinal bleeding or ulceration such as: nonsteroidal anti-inflammatory drugs (NSAIDs); antiplatelet or anticoagulants; selective serotonin reuptake inhibitors or serotonin and noradrenaline reuptake inhibitors; oral corticosteroids; and alendronate. For the renal and urinary disorders SOC, potentially inappropriate concomitant therapy included medicines which may increase the risk of renal impairment or failure such as: other NSAIDs; ACE inhibitors (ACE-Is) or angiotensin II receptor blockers (ARBs); diuretics; and a combination of	Therapeutic Guidelines Limited. Therapeutic guidelines: rheumatology. Version 3. 2017. [cited 2018 Aug 15]. Available from: http://www.tg.org.au/. Australian Medicines Handbook: Australian medicines handbook Pty. Ltd. 2018. [cited 2018 Aug 15]. Available from: http://amhonline.amh.net.au/.	the US Food and Drug Administration Adverse Events Reporting System; Health Canada's Vigilance Adverse Reaction Online Database; the Australian Therapeutic Goods Administration's Database of Adverse Event Notifications (January 1, 2008-April 30, 2018)	Overuse (72.00%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
			medicines known as the 'triple whammy' (NSAID with an ACE-I/ARB and a diuretic) [23]. Concomitant medicines use for the vascular disorders SOC focussed on medicines which may increase the risk of hypertension such as additional NSAIDs, and on identifying instances where celecoxib was being used in individuals already on antihypertensive therapy such as ACE-Is/ARBs, beta blockers and diuretics.			
Beauséjour, 2015	Diagnostics (Referrals)	Orthopaedic Pediatric Clinic (Adolescent Idiopathic Scoliosis)	Inappropriate referrals illustrate the idea that patients without a clinically significant scoliosis may have advantageously been evaluated and reassured by a primary care physician (over referral to a tertiary care hospital). Inappropriate referrals were those patients with curve magnitude below the diagnostic criteria, i.e., 10 degrees or less).	Canadian Task Force on the Periodic Health Examination. The periodic health examination. Can Med Assoc J. 1979; 121:1193–254. Goldbloom RB. Screening for Idiopathic Adolescent Scoliosis. In: Canadian Task Force on the Periodic Health Examination: Canadian Guide to Clinical Preventive Healthcare. Ottawa: Health Canada; 1994. p. 346–54. U.S. Preventive Services Task Force. Screening for Idiopathic Scoliosis in Adolescents: Recommendation Statement. June 2004. Agency for Healthcare Research and Quality, Rockville, MD. http://www.uspreventive servicestaskforce.org/Page/Document/UpdateSummaryFinal/idiopathicscoliosis-in-adolescents-screening?ds=1&s=scoliosis; Accessed on 2015-11-02.	Not specified (January 1, 2007-August 1, 2007)	Overuse (32.40%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				British Orthopaedic Association and British Scoliosis Society. School screening for scoliosis. British Med J. 1983;287(6397):963–4.		
Beauséjour, 2015	Diagnostics (Referrals)	Orthopaedic Pediatric Clinics (Adolescent Idiopathic Scoliosis)	Late referrals identify patients that were referred late to benefit from conservative management of scoliosis with best outcomes. Late referrals occur when skeletal maturity and curve magnitude at the initial visit in orthopaedics are beyond the indications for brace treatment (suggesting the need for surgical management) or are less likely to respond to treatment. Therefore, patients presenting with a Cobb angle greater than 40°, regardless of skeletal maturity, and immature patients (Risser sign of 0, 1, 2, or 3) with a Cobb angle greater than 30° were all considered late referrals.	Canadian Task Force on the Periodic Health Examination. The periodic health examination. Can Med Assoc J. 1979; 121:1193–254. Goldbloom RB. Screening for Idiopathic Adolescent Scoliosis. In: Canadian Task Force on the Periodic Health Examination: Canadian Guide to Clinical Preventive Healthcare. Ottawa: Health Canada; 1994. p. 346–54. U.S. Preventive Services Task Force. Screening for Idiopathic Scoliosis in Adolescents: Recommendation Statement. June 2004. Agency for Healthcare Research and Quality, Rockville, MD. http://www.uspreventive servicestaskforce.org/Page/Document/UpdateSummaryFinal/idiopathicscoliosis-in-adolescents-screening?ds=1&s=scoliosis; Accessed on 2015-11-02. British Orthopaedic Association and British Scoliosis Society. School screening for scoliosis. British Med J. 1983;287(6397):963–4.	Not specified (January 1, 2007-August 1, 2007)	Underuse (17.40%)
Bellai-Dussault, 2020	Diagnostics (Screening)	Cell-free DNA prenatal screening (Prenatal)	Cell-free DNA prenatal screening to assess for aneuploidy (abnormal number of chromosomes) is recommended when a nuchal translucency (NT) measurement is greater than or equal to 3.5 mm on ultrasound.	Prenatal Screening Ontario. Current criteria for publicly funded non- invasive prenatal testing (NIPT) in Ontario. 2018. https://prenatalscreeningontario.ca/current-criteria-for-publicly-funded-noninvasive-prenatal-testing-nipt-in-ontario/. Accessed April 18, 2019. Audibert F, De Bie I, Johnson JA, et al. No. 348-Joint SOGC-CCMG guideline: update on prenatal screening for fetal aneuploidy, fetal anomalies, and	BORN prescribed registry (January 1, 2016 - December 31, 2017)	Overuse (17.90%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				adverse pregnancy outcomes. J Obstet Gynaecol Can.2017;39(9):805-817.		
Bellai-Dussault, 2020	Diagnostics (Screening)	Cell-free DNA prenatal screening (Prenatal)	Cell-free DNA prenatal screening to assess for aneuploidy (abnormal number of chromosomes) is recommended for a positive Multiple Marker Screening (MMS) result (pregnancy-associated plasma protein-A (PAPP-A).	Prenatal Screening Ontario. Current criteria for publicly funded non- invasive prenatal testing (NIPT) in Ontario. 2018. https:// prenatalscreeningontario.ca/current-criteria-for-publicly-funded-noninvasive-prenatal-testing-nipt-in-ontario/. Accessed April 18, 2019. Audibert F, De Bie I, Johnson JA, et al. No. 348-Joint SOGC-CCMG guideline: update on prenatal screening for fetal aneuploidy, fetal anomalies, and adverse pregnancy outcomes. J Obstet Gynaecol Can.2017;39(9):805-817.	BORN prescribed registry (January 1, 2016 - December 31, 2017)	Overuse (2.90%)
Bellai-Dussault, 2020	Diagnostics (Screening)	Cell-free DNA prenatal screening (Prenatal)	Cell-free DNA prenatal screening to assess for aneuploidy (abnormal number of chromosomes) is recommended based on advanced maternal age (greater than or equal to 40 years).	Prenatal Screening Ontario. Current criteria for publicly funded non- invasive prenatal testing (NIPT) in Ontario. 2018. https:// prenatalscreeningontario.ca/current-criteria-for-publicly-funded-noninvasive-prenatal-testing-nipt-in-ontario/. Accessed April 18, 2019. Audibert F, De Bie I, Johnson JA, et al. No. 348-Joint SOGC-CCMG guideline: update on prenatal screening for fetal aneuploidy, fetal anomalies, and adverse pregnancy outcomes. J Obstet Gynaecol Can.2017;39(9):805-817.	BORN prescribed registry (January 1, 2016 - December 31, 2017)	Overuse (0.70%)
Bello, 2019	Therapeutics (Medications)	ACE Inhibitors OR ARB (Chronic Kidney Disease)	Guidelines recommend that patients are prescribed an Angiotensin-converting enzyme inhibitors (ACEIs) or Angiotensin II receptor blocker (ARBs) any time in the 1 year after the confirmation of CKD who have evidence of proteinuria and/or diabetes.	National Collaborating Centre for Chronic Conditions (UK). Chronic Kidney Disease: National Clinical Guideline for Early Identification and Management in Adults in Primary and Secondary Care. London, England: Royal College of Physician; 2008. Akbari A, Clase CM, Acott P, et al. Canadian Society of Nephrology commentary on the KDIGO clinical practice guideline for CKD evaluation and management. Am J Kidney Dis. 2015;65(2):177-205. doi: 10.1053/j.ajkd.2014.10.013 [PubMed: 25511161] [CrossRef: 10.1053/j.ajkd.2014.10.013]	Canadian Primary Care Sentinel Surveillance Network (January 1, 2010 - December 31, 2015)	Underuse (69.50%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				Levin A, Hemmelgarn B, Culleton B, et al.; Canadian Society of Nephrology . Guidelines for the management of chronic kidney disease. CMAJ. 2008;179(11):1154-1162. doi:10.1503/cmaj.080351 [PMCID: PMC2582781] [PubMed:19015566] [CrossRef: 10.1503/cmaj.080351]		
Bello, 2019	Diagnostics (Laboratory tests (non-blood tests))	Albumin-to-Creatinine Ratio (Chronic Kidney Disease)	For the detection and recognition of Chronic Kidney Disease (CKD) guidelines recommend that patients receive urine albumin to creatinine ratio (UACR) testing within 6 months of initial eGFR less than 60 mL/min per 1.73m2.	National Collaborating Centre for Chronic Conditions (UK). Chronic Kidney Disease: National Clinical Guideline for Early Identification and Management in Adults in Primary and Secondary Care. London, England: Royal College of Physician; 2008. Akbari A, Clase CM, Acott P, et al.Canadian Society of Nephrology commentary on the KDIGO clinical practice guideline for CKD evaluation and management. Am J Kidney Dis. 2015;65(2):177-205. doi: 10.1053/j.ajkd.2014.10.013 [PubMed: 25511161] [CrossRef: 10.1053/j.ajkd.2014.10.013] Levin A, Hemmelgarn B, Culleton B, et al.; Canadian Society of Nephrology. Guidelines for the management of chronic kidney disease. CMAJ. 2008;179(11):1154-1162. doi:10.1503/cmaj.080351 [PMCID: PMC2582781] [PubMed:19015566] [CrossRef: 10.1503/cmaj.080351]	Canadian Primary Care Sentinel Surveillance Network (January 1, 2010 - December 31, 2015)	Underuse (81.60%)
Bello, 2019	Diagnostics (Laboratory tests (non-blood tests))	Albumin-to-Creatinine Ratio (Chronic Kidney Disease)	For testing and monitoring of kidney function guidelines recommend that patients receive a Urine Albumin-to-Creatinine Ratio (UACR) test in the 18 months following the confirmation of Chronic Kidney Disease (CKD).	National Collaborating Centre for Chronic Conditions (UK). Chronic Kidney Disease: National Clinical Guideline for Early Identification and Management in Adults in Primary and Secondary Care. London, England: Royal College of Physician; 2008. Akbari A, Clase CM, Acott P, et al. Canadian Society of Nephrology commentary on the KDIGO clinical practice guideline for CKD evaluation and management. Am J Kidney Dis. 2015;65(2):177-205. doi: 10.1053/j.ajkd.2014.10.013 [PubMed: 25511161] [CrossRef: 10.1053/j.ajkd.2014.10.013]	Canadian Primary Care Sentinel Surveillance Network (January 1, 2010 - December 31, 2015)	Underuse (73.00%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				Levin A, Hemmelgarn B, Culleton B, et al.; Canadian Society of Nephrology. Guidelines for the management of chronic kidney disease. CMAJ. 2008;179(11):1154-1162. doi:10.1503/cmaj.080351 [PMCID: PMC2582781] [PubMed:19015566] [CrossRef: 10.1503/cmaj.080351]		
Bello, 2019	Diagnostics (Assessments)	Blood Pressure (Chronic Kidney Disease)	Guidelines recommend that patients receive Blood Pressure (BP) measurement at any time during treatment of Chronic Kidney Disease (CKD).	National Collaborating Centre for Chronic Conditions (UK). Chronic Kidney Disease: National Clinical Guideline for Early Identification and Management in Adults in Primary and Secondary Care. London, England: Royal College of Physician; 2008. Akbari A, Clase CM, Acott P, et al. Canadian Society of Nephrology commentary on the KDIGO clinical practice guideline for CKD evaluation and management. Am J Kidney Dis. 2015;65(2):177-205. doi: 10.1053/j.ajkd.2014.10.013 [PubMed: 25511161] [CrossRef: 10.1053/j.ajkd.2014.10.013] Levin A, Hemmelgarn B, Culleton B, et al.; Canadian Society of Nephrology. Guidelines for the management of chronic kidney disease. CMAJ. 2008;179(11):1154-1162. doi:10.1503/cmaj.080351 [PMCID: PMC2582781] [PubMed:19015566] [CrossRef: 10.1503/cmaj.080351]	Canadian Primary Care Sentinel Surveillance Network (January 1, 2010 - December 31, 2015)	Underuse (24.30%)
Bello, 2019	Diagnostics (Blood tests)	Serum Creatinine (Chronic Kidney Disease)	Guidelines recommend that patients are monitored after initiation of treatment with Angiotensin-converting enzyme inhibitors (ACEIs) or Angiotensin II receptor blocker (ARBs) with confirmed Chronic Kidney Disease (CKD) who received an outpatient Serum Creatinine (SCr) test 7-	National Collaborating Centre for Chronic Conditions (UK). Chronic Kidney Disease: National Clinical Guideline for Early Identification and Management in Adults in Primary and Secondary Care. London, England: Royal College of Physician; 2008. Akbari A, Clase CM, Acott P, et al. Canadian Society of Nephrology commentary on the KDIGO clinical practice guideline for CKD evaluation and management. Am J Kidney Dis. 2015;65(2):177-205. doi: 10.1053/j.ajkd.2014.10.013 [PubMed: 25511161] [CrossRef: 10.1053/j.ajkd.2014.10.013]	Canadian Primary Care Sentinel Surveillance Network (January 1, 2010 - December 31, 2015)	Underuse (73.30%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
			30 days after initial ACEI or ARB prescription date.	Levin A, Hemmelgarn B, Culleton B, et al.; Canadian Society of Nephrology. Guidelines for the management of chronic kidney disease. CMAJ. 2008;179(11):1154-1162. doi:10.1503/cmaj.080351 [PMCID: PMC2582781] [PubMed:19015566] [CrossRef: 10.1503/cmaj.080351]		
Bello, 2019	Diagnostics (Blood tests)	Serum Creatinine (Chronic Kidney Disease)	For testing and monitoring of kidney function guidelines recommend that patients receive an outpatient Serum Creatinine (SCr) test in the 18 months after the confirmation of Chronic Kidney Disease (CKD).	National Collaborating Centre for Chronic Conditions (UK). Chronic Kidney Disease: National Clinical Guideline for Early Identification and Management in Adults in Primary and Secondary Care. London, England: Royal College of Physician; 2008. Akbari A, Clase CM, Acott P, et al. Canadian Society of Nephrology commentary on the KDIGO clinical practice guideline for CKD evaluation and management. Am J Kidney Dis. 2015;65(2):177-205. doi: 10.1053/j.ajkd.2014.10.013 [PubMed: 25511161] [CrossRef: 10.1053/j.ajkd.2014.10.013] Levin A, Hemmelgarn B, Culleton B, et al.; Canadian Society of Nephrology. Guidelines for the management of chronic kidney disease. CMAJ. 2008;179(11):1154-1162. doi:10.1503/cmaj.080351 [PMCID: PMC2582781] [PubMed:19015566] [CrossRef: 10.1503/cmaj.080351]	Canadian Primary Care Sentinel Surveillance Network (January 1, 2010 - December 31, 2015)	Underuse (14.50%)
Bello, 2019	Diagnostics (Blood tests)	Glycated Hemoglobin (HbA1c) (Chronic Kidney Disease)	Guidelines recommend that patients receive HbA1c testing within the first and second year of Chronic Kidney Disease (CKD) treatment.	National Collaborating Centre for Chronic Conditions (UK). Chronic Kidney Disease: National Clinical Guideline for Early Identification and Management in Adults in Primary and Secondary Care. London, England: Royal College of Physician; 2008. Akbari A, Clase CM, Acott P, et al. Canadian Society of Nephrology commentary on the KDIGO clinical practice guideline for CKD evaluation and management. Am J Kidney Dis. 2015;65(2):177-205. doi: 10.1053/j.ajkd.2014.10.013 [PubMed: 25511161] [CrossRef: 10.1053/j.ajkd.2014.10.013]	Canadian Primary Care Sentinel Surveillance Network (January 1, 2010 - December 31, 2015)	Underuse (33.10%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				Levin A, Hemmelgarn B, Culleton B, et al.; Canadian Society of Nephrology. Guidelines for the management of chronic kidney disease. CMAJ. 2008;179(11):1154-1162. doi:10.1503/cmaj.080351 [PMCID: PMC2582781] [PubMed:19015566] [CrossRef: 10.1503/cmaj.080351]		
Bello, 2019	Therapeutics (Medications)	Statins- Drug Unknown (Chronic Kidney Disease)	Guidelines recommend that patients are prescribed a statin any time in the 1 year after the confirmation of Chronic Kidney Disease (CKD).	National Collaborating Centre for Chronic Conditions (UK). Chronic Kidney Disease: National Clinical Guideline for Early Identification and Management in Adults in Primary and Secondary Care. London, England: Royal College of Physician; 2008. Akbari A, Clase CM, Acott P, et al. Canadian Society of Nephrology commentary on the KDIGO clinical practice guideline for CKD evaluation and management. Am J Kidney Dis. 2015;65(2):177-205. doi: 10.1053/j.ajkd.2014.10.013 [PubMed: 25511161] [CrossRef: 10.1053/j.ajkd.2014.10.013] Levin A, Hemmelgarn B, Culleton B, et al.; Canadian Society of Nephrology. Guidelines for the management of chronic kidney disease. CMAJ. 2008;179(11):1154-1162. doi:10.1503/cmaj.080351 [PMCID: PMC2582781] [PubMed:19015566] [CrossRef: 10.1503/cmaj.080351]	Canadian Primary Care Sentinel Surveillance Network (January 1, 2010 - December 31, 2015)	Underuse (63.30%)
Bernier, 2018	Therapeutics (Biophysical Therapy)	Cardiac Resynchronizatio n Therapy (Had Life-threatening Ventricular Tachyarrhythmia or High-risk for Sudden Cardiac Death)	Not clearly stated in study; (from results, recommendation: CRT implants meeting a Class IIa indication according to ACC/AHA/HRS guidelines were not considered appropriate because patients had atrial fibrillation and a LVEF<0.35).	Russo AM, Stainback RF, Bailey SR, et al. ACCF/HRS/AHA/ASE/HFSA/SCAI/SCCT/SCMR 2013 appropriate use criteria for implantable cardioverter-defibrillators and cardiac resynchronization therapy. Heart Rhythm 2013;10: e58. https://doi.org/10.1016/j.hrthm.2013.01.008. Epstein AE, DiMarco JP, Ellenbogen KA, et al. ACC/AHA/HRS 2008 guidelines for device-based therapy of cardiac rhythm abnormalities. J Am Coll Cardiol 2008;51: e62. Exner DV, Birnie DH, Moe G, et al. Canadian cardiovascular society guidelines on the use of	N/A (January 1, 2015 - December 31, 2016)	Overuse (10.00%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				cardiac resynchronization therapy: evidence and patient selection. Can J Cardiol 2013; 29:182-95.		
Bernier, 2018	Therapeutics (Biophysical Therapy)	Implantable Cardioverter Defibrillator Therapy (Had Life-threatening Ventricular Tachyarrhythmia or High-risk for Sudden Cardiac Death)	Not clearly stated in study; (from results, recommendation: ICD implant was not guideline adherent according to ACC/AHA/HRS guidelines.	Russo AM, Stainback RF, Bailey SR, et al. ACCF/HRS/AHA/ASE/HFSA/SCAI/SCCT/SCMR 2013 appropriate use criteria for implantable cardioverter-defibrillators and cardiac resynchronization therapy. Heart Rhythm 2013;10: e58. https://doi.org/10.1016/j.hrthm.2013.01.008. Epstein AE, DiMarco JP, Ellenbogen KA, et al. ACC/AHA/HRS 2008 guidelines for device-based therapy of cardiac rhythm abnormalities. J Am Coll Cardiol 2008;51: e62. Exner DV, Birnie DH, Moe G, et al. Canadian cardiovascular society guidelines on the use of cardiac resynchronization therapy: evidence and patient selection. Can J Cardiol 2013; 29:182-95.	N/A (January 1, 2015 - December 31, 2016)	Overuse (<1%)
Beyea, 2018	Diagnostics (Assessments)	Impedance Testing (Tympanostomy Tube Insertion)	Guidelines recommend that age-appropriate hearing tests (impedance testing) are performed prior to surgery if the child becomes a candidate for Typanostomy Tube (TT) placement. Preoperative audiological testing determines appropriate expectations for hearing improvement with surgery and may detect permanent (sensorineural) hearing loss.	Rosenfeld RM, Schwartz SR, Pynnonen MA, et al. Clinical practice guideline tympanostomy tubes in children. Otolaryngol Head Neck Surg. 2013;149: S1-S35.	The Registered Persons Database; Ontario Health Insurance Plan; The ICES Physician Database (August 1, 2013 - June 30, 2016)	Underuse (22.70%)
Beyea, 2018	Diagnostics (Assessments)	Audiometric Testing	Guidelines recommend that age-appropriate hearing tests	Rosenfeld RM, Schwartz SR, Pynnonen MA, et al. Clinical practice guideline tympanostomy tubes in	The Registered Persons	Underuse (27.30%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
		(Tympanostomy Tube Insertion)	(audiometric testing) are performed prior to surgery if the child becomes a candidate for Typanostomy Tube (TT) placement. Preoperative audiological testing determines appropriate expectations for hearing improvement with surgery and may detect permanent (sensorineural) hearing loss.	children. Otolaryngol Head Neck Surg. 2013;149: S1-S35.	Database; Ontario Health Insurance Plan; The ICES Physician Database (August 1, 2013 - June 30, 2016)	
Bhatia (a), 2017	Diagnostics (Assessments)	Electrocardiogram (Annual Health Exam (low-risk adults))	Recommended that low-risk patients do not receive an electrocardiogram (ECG).	Chou R, Arora B, Dana T, Fu R, Walker M, Humphrey L. Screening asymptomatic adults with resting or exercise electrocardiography: a review of the evidence for the U.S. Preventive Services Task Force. Ann Intern Med. 2011;155(6):375-385.	Ontario Health Insurance Plan; Discharge Abstract Database; Ontario Diabetes Database; Ontario Hypertension Database; Registered Persons Database; Client Agency Program Enrolment tables; ICES Physicians Database (April 1, 2010 - March 31, 2015)	Overuse(21.50 %)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
Bhatia (b), 2017	Diagnostics (Imaging)	Transthoracic Echocardiogram (CVD)	Not explicitly stated in study, but authors classified appropriateness of TTEs based on the 2011 AUC for echocardiography. From results, these TTEs were deemed 'rarely appropriate.'	Patel MR, Spertus JA, Brindis RG, et al. ACCF proposed method for evaluating the appropriateness of cardiovascular imaging. J Am Coll Cardiol 2005; 46:1606–13. Patel MR, Bailey SR, Bonow RO, et al. ACCF/SCAI/AATS/AHA/ASE/ASNC/HFSA/HRS/SCCM/SCCT/SCMR/STS 2012 appropriate use criteria for diagnostic catheterization: a report of the American College of Cardiology Foundation Appropriate Use Criteria Task Force, Society for Cardiovascular Angiography and Interventions, American Association for Thoracic Surgery,AmericanHeart Association, American Society of Echocardiography, American Society ofNuclear Cardiology,Heart Failure Society of America, Heart Rhythm Society, Society of Critical Care Medicine, Society of Cardiovascular Computed Tomography, Society for Cardiovascular Magnetic Resonance, and Society of Thoracic Surgeons. J Am Coll Cardiol 2012;59:1995–2027 Wolk MJ, Bailey SR, Doherty JU, et al. ACCF/AHA/ASE/ASNC/HFSA/HRS/SCAI/SCCT/SCMR/STS 2013 multimodality appropriate use criteria for the detection and risk assessment of stable ischemic heart disease: a report of the American College of Cardiology Foundation Appropriate Use Criteria Task Force, American Heart Association, American Society of Echocardiography, American Society of Nuclear Cardiology, Heart Failure Society of America, Heart Rhythm Society, Society for Cardiovascular Angiography and Interventions, Society of Cardiovascular Computed Tomography, Society for Cardiovascular Magnetic Resonance, and Society of Thoracic Surgeons. J Am Coll Cardiol 2014; 63:380–406. Hendel RC, Berman DS, Di Carli MF, et al. ACCF/ASNC/ACR/AHA/ASE/SCCT/SCMR/SNM 2009 appropriate use criteria for cardiac radionuclide	University Health Network, Mount Sinai Hospital, Sunnybrook Health Sciences Centre, St. Michael's Hospital; Women's College Hospital; Rural hospitals: Kingston General Hospital (December 1, 2014-April 17, 2016)	Overuse (12.40%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				imaging: a report of the American College of Cardiology Foundation Appropriate Use Criteria Task Force, the American Society of Nuclear Cardiology, the American College of Radiology, the American Heart Association, the American Society of Echocardiography, the Society of Cardiovascular Computed Tomography, the Society for Cardiovascular Magnetic Resonance, and the Society of Nuclear Medicine. J Am Coll Cardiol 2009; 53:2201–29. Douglas PS, Garcia MJ, Haines DE, et al. ACCF/ASE/AHA/ASNC/HFSA/HRS/SCAI/SCCM/ SCCT/SCMR 2011 appropriate use criteria for echocardiography: a report of the American College of Cardiology Foundation Appropriate Use Criteria Task Force, American Society of Echocardiography, American Heart Association, American Society of Nuclear Cardiology, Heart Failure Society of America, Heart Rhythm Society, Society for Cardiovascular Angiography and Interventions, Society of Critical Care Medicine, Society of Cardiovascular Computed Tomography, Society for Cardiovascular Magnetic Resonance American College of Chest Physicians. J Am Coll Cardiol 2011; 57:1126–66.		
Bhatt, 2018	Therapeutics (Biophysical Therapy)	Pre-operative - Fasting-Liquids (Parenteral Procedural Sedation)	Guidelines specify a minimum fasting period of 2 hours for clear liquids, 4 hours for breast milk and 6 hours for infant formula.	American Society of Anesthesiologists Committee. Practice guidelines for preoperative fasting and the use of pharmacologic agents to reduce the risk of pulmonary aspiration: application to healthy patients undergoing elective procedures: an updated report by the American Society of Anesthesiologists Committee on Standards and Practice Parameters. Anesthesiology. 2011;114(3): 495-511. Committee on Drugs. American Academy of Pediatrics. Guidelines for monitoring and management of pediatric patients during and after sedation for diagnostic and therapeutic procedures: addendum. Pediatrics. 2002;110(4):836-838.	The IWK Health Centre in Halifax; Montreal Children's Hospital in Montreal; Children's Hospital of Eastern Ontario in Ottawa; The Hospital for Sick Children	Underuse (5.00%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				American Society of Anesthesiologists Task Force on Sedation and Analgesia by Non-Anesthesiologists. Practice guidelines for sedation and analgesia by non-anesthesiologists. Anesthesiology. 2002;96(4):1004-1017.	in Toronto; Stollery Children's Hospital in Edmonton; and Alberta Children's Hospital in Calgary (July 10, 2010 - February 28, 2015)	
Bhatt, 2018	Therapeutics (Biophysical Therapy)	Pre-operative - Fasting-Solids (Parenteral Procedural Sedation)	Guidelines specify a minimum fasting period of 8 hours for solids containing meat or fatty foods.	American Society of Anesthesiologists Committee. Practice guidelines for preoperative fasting and the use of pharmacologic agents to reduce the risk of pulmonary aspiration: application to healthy patients undergoing elective procedures: an updated report by the American Society of Anesthesiologists Committee on Standards and Practice Parameters. Anesthesiology. 2011;114(3): 495-511. Committee on Drugs. American Academy of Pediatrics. Guidelines for monitoring and management of pediatric patients during and after sedation for diagnostic and therapeutic procedures: addendum. Pediatrics. 2002;110(4):836-838. American Society of Anesthesiologists Task Force on Sedation and Analgesia by Non-Anesthesiologists. Practice guidelines for sedation and analgesia by non-anesthesiologists. Anesthesiology. 2002;96(4):1004-1017.	The IWK Health Centre in Halifax; Montreal Children's Hospital in Montreal; Children's Hospital of Eastern Ontario in Ottawa; The Hospital for Sick Children in Toronto; Stollery Children's Hospital in Edmonton; and Alberta Children's Hospital in Calgary (July 10, 2010 - February 28, 2015)	Underuse (48.10%)
Birk-Urovitz, 2017	Diagnostics (Blood tests)	Thyroid Stimulating Hormone	Thyroid Stimulating Hormone (TSH) test ordered for a patient	Ontario Association of Medical Laboratories. Guideline for the use of laboratory tests to detect thyroid dysfunction. CLP 015. North York, ON:	Tertiary hospital (Sunnybrook	Overuse (22.40%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
		(Diabetes mellitus)	who presents with ≥ 1 symptoms or signs of primary hypothyroidism or with a previously unresolved investigation with results that might be directly associated with primary hypothyroidism (i.e., anemia, hyperlipidemia, prolonged QT interval).	Ontario Association of Medical Laboratories; 2007. Available from: http://oaml.com/wp-content/uploads/2016/05/FINALTSH-Guideline-July-18-07.pdf. Accessed 2017 Aug 9. Beaulieu MD. Screening for thyroid disorders and thyroid cancer in asymptomatic adults. In: The Canadian Task Force on the Periodic Health Examination. The Canadian guide to clinical preventive health care. Ottawa, ON: Canada Communication Group; 1994. p. 612-8. Kaulback K. Periodic health examinations: a rapid review. Toronto, ON: Health Quality Ontario; 2012. Available from: www.hqontario.ca/Portals/0/Documents/evidence/rapid-reviews/periodic-health-exams-121130-en.pdf. Accessed 2017 Aug 9. Guidelines and Protocols Advisory Committee. Thyroid function tests: diagnoses and monitoring of thyroid function disorders in adults. Victoria, BC: Government of BC; 2010. Available from: www2.gov.bc.ca/assets/gov/health/practitioner-pro/bc-guidelines/thyroid.pdf. Accessed 2016 Feb 7. Toward Optimized Practice Clinical Practice Guideline Working Group. Clinical practice guideline: investigation and management of primary thyroid dysfunction. Edmonton, AB: Toward Optimized Practice; 2008. Available from: www.topal bertadoctors.org/download/348/thyroid_pda.pdf. Accessed 2016 Feb 7.	Health Sciences Centre); Community-based hospital (Southlake Regional Health Centre) (July 1, 2009-September 15, 2013)	
Bisch, 2018	Therapeutics (Biophysical Therapy)	Enhanced Recovery After Surgery (ERAS Bundle) (Gynecologic Surgeries)	The ERAS gynecologic oncology guideline includes 20 care elements that are followed during the pre-, intra-, and post-	G. Nelson, A.D. Altman, A. Nick, L.A. Meyer, P.T. Ramirez, C. Achtari, et al., Guidelines for pre- and intra-operative care in gynecologic/oncology surgery: Enhanced Recovery after Surgery (ERAS®) Society recommendations - Part i, Gynecol. Oncol. 140	ERAS Interactive Audit System; Alberta Discharge Abstract	Underuse (44.60%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
			operative period. Preop: 1. Pre-admission patient education; 2. Avoidance of oral bowel preparation; 3. Oral carbohydrate treatment; 4. Avoidance of long-acting sedative medication; 5. Thrombosis prophylaxis; 6. Antibiotic prophylaxis before incision; 7. PONV prophylaxis administered Intraop; 8. Avoidance of epidural/spinal anesthesia; 9. Avoidance of systemic opioids; 10. Upper-body forced-air heating cover used; 11. Avoidance of nasogastric tube12. Avoidance of resection-site drainage; Postop: 13. Prompt termination of urinary drainage; 14. Stimulation of gut motility; 15. Patient weight recorded POD1; 16. Prompt termination of intravenous fluid infusion; 17. Energy intake (oral nutritional suppl) POD0; 18. Energy intake (oral nutritional suppl) POD1; 19. Mobilization at all on day of surgery; 20. 30 day follow up performed	(2016) 313–322, https://doi.org/10.1016/j.ygyno.2015.11.015. G. Nelson, A.D. Altman, A. Nick, L.A. Meyer, P.T. Ramirez, C. Achtari, et al., Guidelines for postoperative care in gynecologic/oncology surgery: Enhanced Recovery after Surgery (ERAS®) Society recommendations - Part II, Gynecol. Oncol. 140 (2016) 323–332, https://doi.org/10.1016/j.ygyno.2015.12.019.	Database; Enhanced Recovery After Surgery (March 2016 - September 2016)	

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
Bischof, 2015	Therapeutics (Medications)	Cancer-Adjuvant Imatinib Therapy (Gastrointestinal Stromal Tumours)	Patients at intermediate and high risk of recurrence following resection of Gastrointestinal stromal tumours (GIST) should receive adjuvant imatinib.	von Mehren MG, S.; Meyer, C.; Riedel, R.; Van Tine, B. Soft Tissue Sarcoma. NCCN Clinical Practice Guidelines in Oncology. 2013; Version 1.2013. Accessed 2013.	Sunnybrook Health Sciences Centre; University Health Network (January 2009-December 2012)	Underuse (22.00%)
Black, 2018	Therapeutics (Medications)	Antimicrobials (Community Acquired Pneumonia)	Not explicitly stated in study; (from results, recommendation: patients with community-acquired pneumonia should receive an antimicrobial medication).	Antimicrobial handbook – 2012. Halifax (NS): Capital Health, Department of Pharmacy and Division of Infectious Diseases; 2012.	Nova Scotia Health Authority Hospitals (June 22, 2015 - November 2, 2015)	Underuse (71.00%)
Black, 2018	Therapeutics (Medications)	Antimicrobials (Non-purulent Cellulitis)	Not explicitly stated in study; (from results, recommendation: patients with community-acquired pneumonia should receive an antimicrobial medication).	Antimicrobial handbook – 2012. Halifax (NS): Capital Health, Department of Pharmacy and Division of Infectious Diseases; 2012.	Nova Scotia Health Authority Hospitals (June 22, 2015 - November 2, 2015)	Underuse (55.00%)
Black, 2018	Therapeutics (Medications)	Antimicrobials (Urinary Tract Infections)	Not explicitly stated in study; (from results, recommendation: patients with a urinary tract infection (UTI) should receive an antimicrobial medication).	Antimicrobial handbook – 2012. Halifax (NS): Capital Health, Department of Pharmacy and Division of Infectious Diseases; 2012.	Nova Scotia Health Authority Hospitals (June 22, 2015 - November 2, 2015)	Underuse (69.00%)
Bonafide, 2020	Diagnostics (Assessments)	Oxygen saturation (Acute Bronchiolitis)	Guidelines do not recommend using continuous pulse oximetry routinely in children with acute respiratory illness	Ralston SL, Lieberthal AS, Meissner HC, et al; American Academy of Pediatrics. Clinical practice guideline: the diagnosis, management, and prevention of bronchiolitis. Pediatrics. 2014;134(5): e1474-e1502. doi:10.1542/peds.2014-2742	N/A (December 1, 2018-March 31, 2019)	Overuse (42.00%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
			unless they are on supplemental oxygen.	Quinonez RA, Garber MD, Schroeder AR, et al. Choosing wisely in pediatric hospital medicine: five opportunities for improved healthcare value. JHosp Med. 2013;8(9):479-485. doi:10.1002/jhm.2064		
Booth, 2018	Therapeutics (Biophysical Therapy)	Chemotherapy (Neoadjuvant or Adjuvant) (Bladder Cancer)	International guidelines recommend neoadjuvant chemotherapy (NACT) on the basis of level I evidence. Although less robust than NACT, there is growing evidence to suggest that adjuvant chemotherapy (ACT) might offer a comparable benefit to NACT. In this context, practice recent guidelines are now shifting to recommend either NACT or ACT for muscle-invasive bladder cancer (MIBC).	Bellmunt J, Albiol S, Kataja V. Invasive bladder cancer: ESMO clinical recommendations for diagnosis, treatment and follow up. Ann Oncol 2009; 20:79–80. Milowsky MI, Rumble RB, Booth CM, et al. Guideline on muscle invasive and metastatic bladder cancer (European Association of Urology Guideline): American Society of Clinical Oncology Clinical Practice Guideline Endorsement. J Clin Oncol 2016; 34:1945–52. Seah JA, Blais N, North S, et al. Neoadjuvant chemotherapy should be administered to fit patients with newly diagnosed, potentially resectable muscle-invasive urothelial cancer of the bladder (MIBC): a 2013 CAGMO Consensus Statement and Call for a Streamlined Referral Process. Can Urol Assoc J 2013; 7:312–8. Booth CM, Tannock IF. Benefits of adjuvant chemotherapy for bladder cancer. J Am Med Assoc Oncol 2015; 1:727–8.	Ontario Cancer Registry; Canadian Institute for Health Information (2009 - 2013)	Underuse (64.90%)
Bouck, 2018	Diagnostics (Imaging)	Radiography-Chest (Annual Health Exam (low-risk adults))	Guidelines do not recommend chest radiography for low-risk patients.	Coblentz CL, Matzinger F, Samson LM, et al. CAR standards for chest radiography. Ottawa: Canadian Association of Radiologists; 2000. Expert Panel on Thoracic Imaging; McComb BL, Chung JH, Crabtree TD, et al. ACR Appropriateness Criteria® routine chest radiography. J Thorac Imaging 2016;31: W13-5. Fine B, Dhanoa D. Imaging appropriateness criteria — why Canadian family physicians should care. Can Fam Physician 2014; 60:217-8.	Ontario Health Insurance Plan claims database; Registered Persons Database; Client Agency Program Enrolment tables; Discharge	Overuse (2.42%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				Annual physical examination practices by province/territory in Canada. Mississauga (ON): The College of Family Physicians of Canada; 2013. Available: www.cfpc.ca/uploadedFiles/Health_Policy/CFPC_Policy_Papers_and_Endorsements/CFPC_Policy_Papers/CFPC%20PT%20Annual%20Exam.pdf (accessed 2017 Apr. 24). College of Family Physicians of Canada. Thirteen things physicians and patients should question [updated January 2018]. Available: https://choosingwiselycanada.org/family-medicine/ (accessed 2017 June 8). Referral guidelines: 2012 CAR Diagnostic Imaging Referral Guidelines — Sections C, E, F, J and K. Ottawa: The Canadian Association of Radiologists. Available: https://na01.safelinks.protection.outlook.com/?url=https%3A%2F%2Fcar.ca%2Fpatient-care%2Freferral-guidelines%2F&data=02%7C01%7CSacha.Bhatia%40wchospital.ca%7C1b1bb0a8652a4f7c611f08d5a94b2e2c%7C26033a94b4704c0bae8b58ee1d2eea24%7C0%7C1%7C636601062724147974&sdata=RM2Ca9LNcaRaG19cZMIW0ppds36771duOky8efLK0H8%3D&reserved=0(accessed 2017 June 12).	Abstract Database; National Ambulatory Care Reporting System; ICES Physician Database. (April 1, 2010 - March 31, 2015)	
Bouck, 2019	Diagnostics (Imaging)	Chest X-Ray or Echocardiogram (Preoperative (cardiovascular surgeries))	Guidelines do not recommend routine preoperative testing (e.g., chest X-ray, echocardiogram) in low-risk surgical patients. Specific tests not provided in results.	Canadian Association of Radiologists. Radiology: five things physicians and patients should question. Choosing Wisely Canada; 2014. Available: http://www.choosingwiselycanada.org/recommendations/radiology/ (accessed 2016 November 30). College of Family Physicians of Canada. Family medicine: eleven things physicians and patients should question. Choosing Wisely Canada; 2014. Available: http://choosingwiselycanada.org/recommendations/familymedicine/ (accessed 2016 November 28).	Patient Level Physician Billing Data Repository; Discharge Abstract Database; National Ambulatory Care Reporting System; Institute of	Overuse (25.10%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				Canadian Anesthesiologists' Society. Anesthesiology: five things physicians and patients should question. Choosing Wisely Canada; 2015. Available: http://www.choosingwiselycanada.org/recommendations/anesthesiology/ (accessed 2016 November 28). Canadian Cardiovascular Society. Cardiology: five things physicians and patients should question. Choosing Wisely Canada; 2014. Available: http://www.choosingwiselycanada.org/recommendations/cardiology/ (accessed 2016 November 30). Canadian Society of Internal Medicine. Internal medicine: five things physicians and patients should question. Choosing Wisely Canada; 2014. Available: http://www.choosingwiselycanada.org/recommendations/internalmedicine/ (accessed 2016 December 1). Canadian Task Force on Preventative Health Care (CTFPHC). Recommendations on screening for breast cancer in average-risk women aged 70-74 years. CMAJ. 2011;183(17):1991–2001.	Clinical Evaluative Sciences/Choosing Wisely Canada; DAD; NACRS; PLPB; 2012 Canadian Community Health Survey (April 1 2011 - March 31 2012; June 2012 - March 2013; 2012 - 2012)	
Bouck, 2019	Diagnostics (Imaging)	Computed Tomography or Magnetic Resonance Imaging-Lower Spine (Lower Back Pain)	Guidelines do not recommend imaging for lower back pain unless red flags are present. Red flags include suspected epidural abscess or hematoma presenting with acute pain, but no neurological symptoms; suspected cancer; suspected infection; cauda equina syndrome; severe or progressive neurologic deficit; and suspected compression fracture. In patients	Canadian Association of Radiologists. Radiology: five things physicians and patients should question. Choosing Wisely Canada; 2014. Available: http://www.choosingwiselycanada.org/recommendations/radiology/ (accessed 2016 November 30). College of Family Physicians of Canada. Family medicine: eleven things physicians and patients should question. Choosing Wisely Canada; 2014. Available: http://choosingwiselycanada.org/recommendations/familymedicine/ (accessed 2016 November 28). Canadian Anesthesiologists' Society. Anesthesiology: five things physicians and patients should question. Choosing Wisely Canada; 2015. Available:	Patient Level Physician Billing Data Repository; Discharge Abstract Database; National Ambulatory Care Reporting System; Institute of Clinical Evaluative Sciences/Choosing Wisely	Overuse (4.60%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
			with suspected uncomplicated herniated disc or spinal stenosis, imaging is only indicated after at least a six-week trial of conservative management and if symptoms are severe enough that surgery is being considered.	http://www.choosingwiselycanada.org/recommendations/anesthesiology/ (accessed 2016 November 28). Canadian Cardiovascular Society. Cardiology: five things physicians and patients should question. Choosing Wisely Canada; 2014. Available: http://www.choosingwiselycanada.org/recommendations/cardiology/ (accessed 2016 November 30). Canadian Society of Internal Medicine. Internal medicine: five things physicians and patients should question. Choosing Wisely Canada; 2014. Available: http://www.choosingwiselycanada.org/recommendations/internalmedicine/ (accessed 2016 December 1). Canadian Task Force on Preventative Health Care (CTFPHC). Recommendations on screening for breast cancer in average-risk women aged 70-74 years. CMAJ. 2011;183(17):1991–2001.	Canada; DAD; NACRS; PLPB; 2012 Canadian Community Health Survey (April 1 2011 - March 31 2012; June 2012 - March 2013; 2012 - 2012)	
Bouck, 2019	Diagnostics (Screening)	Mammography (Breast Cancer (Screening))	Guidelines do not recommend screening mammography for average-risk women aged 40-49.	Canadian Association of Radiologists. Radiology: five things physicians and patients should question. Choosing Wisely Canada; 2014. Available: http://www.choosingwiselycanada.org/recommendations/radiology/ (accessed 2016 November 30). College of Family Physicians of Canada. Family medicine: eleven things physicians and patients should question. Choosing Wisely Canada; 2014. Available: http://choosingwiselycanada.org/recommendations/familymedicine/ (accessed 2016 November 28). Canadian Anesthesiologists' Society. Anesthesiology: five things physicians and patients should question. Choosing Wisely Canada; 2015. Available: http://www.choosingwiselycanada.org/recommendations/anesthesiology/ (accessed 2016 November 28).	Patient Level Physician Billing Data Repository; Discharge Abstract Database; National Ambulatory Care Reporting System; Institute of Clinical Evaluative Sciences/Choosing Wisely Canada; DAD; NACRS; PLPB; 2012	Overuse (22.20%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				Canadian Cardiovascular Society. Cardiology: five things physicians and patients should question. Choosing Wisely Canada; 2014. Available: http://www.choosingwiselycanada.org/recommendations/cardiology/ (accessed 2016 November 30). Canadian Society of Internal Medicine. Internal medicine: five things physicians and patients should question. Choosing Wisely Canada; 2014. Available: http://www.choosingwiselycanada.org/recommendations/internalmedicine/ (accessed 2016 December 1). Canadian Task Force on Preventative Health Care (CTFPHC). Recommendations on screening for breast cancer in average-risk women aged 70-74 years. CMAJ. 2011;183(17):1991–2001.	Canadian Community Health Survey (April 1 2011 - March 31 2012; June 2012 - March 2013; 2012 - 2012)	
Bouck, 2019	Diagnostics (Imaging)	Radiography-type not specified (Lower Back Pain)	Guidelines do not recommend X-Ray imaging for lower back pain unless red flags are present. Red flags include suspected epidural abscess or hematoma presenting with acute pain, but no neurological symptoms; suspected cancer; suspected infection; cauda equina syndrome; severe or progressive neurologic deficit; and suspected compression fracture. In patients with suspected uncomplicated herniated disc or spinal stenosis, imaging is only indicated after at least a six-week trial of conservative	Canadian Association of Radiologists. Radiology: five things physicians and patients should question. Choosing Wisely Canada; 2014. Available: http://www.choosingwiselycanada.org/recommendations/radiology/ (accessed 2016 November 30). College of Family Physicians of Canada. Family medicine: eleven things physicians and patients should question. Choosing Wisely Canada; 2014. Available: http://choosingwiselycanada.org/recommendations/familymedicine/ (accessed 2016 November 28). Canadian Anesthesiologists' Society. Anesthesiology: five things physicians and patients should question. Choosing Wisely Canada; 2015. Available: http://www.choosingwiselycanada.org/recommendations/anesthesiology/ (accessed 2016 November 28). Canadian Cardiovascular Society. Cardiology: five things physicians and patients should question. Choosing Wisely Canada; 2014. Available: http://	Patient Level Physician Billing Data Repository; Discharge Abstract Database; National Ambulatory Care Reporting System; Institute of Clinical Evaluative Sciences/Choosing Wisely Canada; DAD; NACRS; PLPB; 2012 Canadian Community Health Survey	Overuse (29.10%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
			management and if symptoms are severe enough that surgery is being considered.	www.choosingwiselycanada.org/recommendations/cardiology/ (accessed 2016 November 30). Canadian Society of Internal Medicine. Internal medicine: five things physicians and patients should question. Choosing Wisely Canada; 2014. Available: http://www.choosingwiselycanada.org/recommendations/internalmedicine/ (accessed 2016 December 1). Canadian Task Force on Preventative Health Care (CTFPHC). Recommendations on screening for breast cancer in average-risk women aged 70-74 years. CMAJ. 2011;183(17):1991–2001.	(April 1 2011 - March 31 2012; June 2012 - March 2013; 2012 - 2012)	
Bowker, 2017	Therapeutics (Medications)	Antihyperglycemics (Gestational Diabetes Mellitus)	Treatment guidelines for Gestational Diabetes Mellitus (GDM) recommend that metformin or insulin therapy be initiated, if lifestyle modification does not achieve glycaemic targets within 2 weeks.	Canadian Diabetes Association Clinical Practice Guidelines. Diabetes in Pregnancy. Available at http://guidelines.diabetes.ca/browse/chapter36. Accessed 30 November 2016.	Alberta Vital Statistics – Birth database; Discharge Abstract Database; Ambulatory Care Classification System; Fee-for-Service Claims for physician office visits database; Alberta Health Care Insurance Population registry; Pharmaceutical Information Network; Vital Statistics database; 2006 census	Underuse (70.50%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
					data from Statistics Canada (2009 -2014)	
Brimble, 2020	Diagnostics (Referrals)	Nephrology Specialist (Chronic Kidney Disease)	Guidelines recommend a referral to nephrology specialists for patients with an eGFR less than 60mL/min./1.73m2 and a decline of at least 5mL/min/1.73m2 over 6months.	Chapter 5: referral to specialists and models of care. Kidney Int Suppl 2013; 3:112–9. Inker LA, Astor BC, Fox CH, et al. KDOQI us commentary on the 2012 KDIGO clinical practice guideline for the evaluation and management of CKD. Am J Kidney Dis 2014; 63:713–35. Akbari A, Clase CM, Acott P, et al. Canadian Society of nephrology commentary on the KDIGO clinical practice guideline for CKD evaluation and management. Am J Kidney Dis 2015; 65:177–205. NICE Guidance. Recommendations chronic kidney disease in adults: assessment and management. Available: https://www.nice.org.uk/guidance/cg182/chapter/1-Recommendations#referral-criteria [Accessed 8 Dec 2019].	Trillium Health Partners; St Joseph's Healthcare Hamilton (January 2015 - March 2015)	Underuse (55.30%)
Brown, 2017	Diagnostics (Blood tests)	Lipid profile (CVD)	The 2012 Canadian Cardiovascular Society (CCS) guidelines recommend lipid screening in men between the ages of 40 and 75 and in women between the ages 50 and 75 every 1 to 5 years; and the 2016 CCS guidelines recommend screening for everyone between the ages of 40 and 75.	Anderson TJ, Grégoire J, Hegele RA, Couture P, Mancini GB, McPherson R, et al. 2012 Update of the Canadian Cardiovascular Society guidelines for the diagnosis and treatment of dyslipidemia for the prevention of cardiovascular disease in the adult. Can J Cardiol 2013;29(2):151-67. Anderson TJ, Grégoire J, Pearson GJ, Barry AR, Couture P, Dawes M, et al. 2016 Canadian Cardiovascular Society guidelines for the management of dyslipidemia for the prevention of cardiovascular disease in the adult. Can J Cardiol 2016;32(11):1263-82.	Manitoba Primary Care Research Network repository (July 1, 2010 - June 30, 2015)	Overuse (18.00%)
Brown, 2017	Therapeutics (Medications)	Statins- Drug Unknown (CVD)	The 2012 and 2016 CCS guidelines recommend that a	Anderson TJ, Grégoire J, Hegele RA, Couture P, Mancini GB, McPherson R, et al. 2012 Update of the Canadian Cardiovascular Society guidelines for the	Manitoba Primary Care Research	Underuse (71.00%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
			Framingham risk score (FRS) be calculated for all primary prevention patients to determine their eligibility for statin therapy, and that all secondary prevention patients (those with clinical evidence of atherosclerosis) be started on statins regardless of score.	diagnosis and treatment of dyslipidemia for the prevention of cardiovascular disease in the adult. Can J Cardiol 2013;29(2):151-67. Anderson TJ, Grégoire J, Pearson GJ, Barry AR, Couture P, Dawes M, et al. 2016 Canadian Cardiovascular Society guidelines for the management of dyslipidemia for the prevention of cardiovascular disease in the adult. Can J Cardiol 2016;32(11):1263-82.	Network repository (July 1, 2010 - June 30, 2015)	
Brundage, 2013	Diagnostics (Imaging)	Bone scan (Prostate Cancer)	Recommended that only patients with high-risk prostate cancer receive a bone scan (and patients with low-risk prostate cancer do not receive a bone scan).	Danielson B, Brundage M, Pearcey R, et al. Development of indicators of the quality of radiotherapy for localized prostate cancer. Radiother Oncol 2011; 99:29–36.	Not specified (July 2007-June 2008)	Overuse (77.60%)
Brundage, 2013	Diagnostics (Imaging)	Bone Scan (Prostate Cancer)	Recommended that only patients with high-risk prostate cancer receive a bone scan (and patients with low-risk prostate cancer do not receive a bone scan).	Danielson B, Brundage M, Pearcey R, et al. Development of indicators of the quality of radiotherapy for localized prostate cancer. Radiother Oncol 2011; 99:29–36.	Not specified (July 2007-June 2008)	Underuse (4.50%)
Brundage, 2013	Diagnostics (Assessments)	Bowel function (Prostate cancer)	Recommended that only patients with high-risk prostate cancer receive a bone scan (and patients with low-risk prostate cancer do not receive a bone scan).	Danielson B, Brundage M, Pearcey R, et al. Development of indicators of the quality of radiotherapy for localized prostate cancer. Radiother Oncol 2011; 99:29–36.	Not specified (July 2007-June 2008)	Underuse (41.50%)
Brundage, 2013	Diagnostics (Imaging)	Computed Tomography or Magnetic Resonance Imaging-Pelvic (Prostate Cancer)	Recommended that only patients with high-risk prostate cancer receive a bone scan (and patients with low-risk prostate cancer do not receive a bone scan).	Danielson B, Brundage M, Pearcey R, et al. Development of indicators of the quality of radiotherapy for localized prostate cancer. Radiother Oncol 2011; 99:29–36.	Not specified (July 2007-June 2008)	Overuse (77.60%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
Brundage, 2013	Diagnostics (Imaging)	Computed Tomography OR MRI (Prostate Cancer)	CT scan or pelvic MRI is recommended for patients with high-risk prostate cancer (and not for patients with low-risk prostate cancer).	Danielson B, Brundage M, Pearcey R, et al. Development of indicators of the quality of radiotherapy for localized prostate cancer. Radiother Oncol 2011; 99:29–36.	Not specified (July 2007-June 2008)	Underuse (21.00%)
Brundage, 2013	Diagnostics (Assessments)	Digital Rectal Exam (Prostate Cancer)	Not provided in study; (from results, recommendation: digital rectal exam completed before external beam therapy for patients with prostate cancer).	Danielson B, Brundage M, Pearcey R, et al. Development of indicators of the quality of radiotherapy for localized prostate cancer. Radiother Oncol 2011; 99:29–36.	Not specified (July 2007-June 2008)	Underuse (6.30%)
Brundage, 2013	Diagnostics (Assessments)	Dose Volume Histogram (Prostate Cancer)	Not provided in study; (from results, recommendation: Dose Volume Histogram (DVH) for Planning Target Volume (PTV) was completed of rectum and bladder before patient received external beam therapy for prostate cancer).	Danielson B, Brundage M, Pearcey R, et al. Development of indicators of the quality of radiotherapy for localized prostate cancer. Radiother Oncol 2011; 99:29–36.	Not specified (July 2007-June 2008)	Underuse (19.40%)
Brundage, 2013	*Multiple Tests*	Prostate Cancer Assessment (Gleason Score, Prostate-specific Antigen and T-stage) (Prostate Cancer)	Not provided in study; (from results, recommendation: Gleason score, PSA and T stage documented for patients with prostate cancer).	Danielson B, Brundage M, Pearcey R, et al. Development of indicators of the quality of radiotherapy for localized prostate cancer. Radiother Oncol 2011; 99:29–36.	Not specified (July 2007-June 2008)	Underuse (9.80%)
Brundage, 2013	Therapeutics (Biophysical Therapy)	Radiation Therapy (Prostate Cancer)	Not provided in study; (from results recommendation appear to be: patients should receive radiation therapy delivered by 3D conformal or Intensity-Modulated Radiation Therapy).	Danielson B, Brundage M, Pearcey R, et al. Development of indicators of the quality of radiotherapy for localized prostate cancer. Radiother Oncol 2011; 99:29–36.	Not specified (July 2007-June 2008)	Underuse (1.40%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
Brundage, 2013	Therapeutics (Biophysical Therapy)	Radiation Therapy (Prostate Cancer)	Pre-treatment assessment (includes documentation of PSA, DRE-derived T category, and Gleason Score; minimum of 6 cores taken at prostate biopsy, with location and number of positive cores specified); Bone scan and CT pelvis for high-risk patients; Documentation: that alternative modalities were presented to patient, treatment side effects/complications discussed, urinary function, bowel function, co-morbidity, sexual function. External Beam Radiation Therapy (EBRT): 3D conformal RT or intensity modulated RT used, Dose volume constraint on the rectum and bladder, use of daily target localization, delivery of adequate dose (70 Gy for low risk, intermediate risk with ADT, and high risk with ADT, and 74 Gy for intermediate risk without ADT). Braychytherapy: Image guidance for brachytherapy using TRUST, CT or MRI,	Danielson B, Brundage M, Pearcey R, et al. Development of indicators of the quality of radiotherapy for localized prostate cancer. Radiother Oncol 2011; 99:29–36.	Not specified (July 2007-June 2008)	Underuse (92.60%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
			pre-implant brachytherapy planning with TRUST, CT or MRI, brachytherapy patient counseling/education on radiation safety/protection, post-implant dosimetric assessment following low dose rate brachytherapy using CT and/or MRI, post-implant dosimetry report includes D90, V100. ADT: Adjuvant ADT for high-risk patients, counseling on appropriate calcium and vitamin D supplementation for patients on ADT. Follow-up: includes PSA, assessment of sexual function, bowel function and urinary function.			
Brundage, 2013	Therapeutics (Biophysical Therapy)	Radiation Therapy + Androgen Deprivation (Prostate Cancer)	Recommended treatment for patients with high-risk prostate cancer (HR-Pca) is radiation therapy (RT) + androgen deprivation therapy (ADT).	Danielson B, Brundage M, Pearcey R, et al. Development of indicators of the quality of radiotherapy for localized prostate cancer. Radiother Oncol 2011; 99:29–36.	Not specified (July 2007-June 2008)	Underuse (68.00%)
Brundage, 2013	Diagnostics (Assessments)	Sexual function (Prostate cancer)	Not provided in study; (from results, recommendation: patients with prostate cancer should receive an assessment of sexual function).	Danielson B, Brundage M, Pearcey R, et al. Development of indicators of the quality of radiotherapy for localized prostate cancer. Radiother Oncol 2011; 99:29–36.	Not specified (July 2007-June 2008)	Underuse (44.50%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
Brundage, 2013	Diagnostics (Assessments)	Urinary function (Prostate Cancer)	Not provided in study; (from results, recommendation: patients with prostate cancer should receive an assessment of their urinary function).	Danielson B, Brundage M, Pearcey R, et al. Development of indicators of the quality of radiotherapy for localized prostate cancer. Radiother Oncol 2011; 99:29–36.	Not specified (July 2007-June 2008)	Underuse (8.00%)
Canadian Institute for Health Information, 2009	Diagnostics (Blood tests)	Glycated Hemoglobin (HbA1c) (Diabetes Mellitus)	Clinical practice guidelines recommend that adults with diabetes have an HbA1c test every three months when glycemic targets are not being met or when treatment is being adjusted or every six months when glycemic targets are being consistently met.	Canadian Diabetes Association Clinical Practice Guidelines Expert Committee, Canadian Diabetes Association 2008 Clinical Practice Guidelines for the Prevention and Management of Diabetes in Canada, Canadian Journal of Diabetes 32 Suppl. (September 2008). A. Allen and C. Rea, Type 2 Diabetes: Living With the Disease, last updated November 14, 2007, cited June 15, 2009, from <http://www.healthlinkbc.ca/kbase/topic/special/uq1114/sec9.htm>. National Collaborating Centre for Chronic Conditions, Type 2 Diabetes: The Management of Type 2 Diabetes, last updated May 2008, cited June 30, 2009, from <http://www.nice.org.uk/nicemedia/pdf/CG66NICEGuideline.pdf>.	Statistics Canada (January 1, 2007-December 31, 2007)	Underuse (18.00%)
Canadian Institute for Health Information, 2009	Diagnostics (Assessments)	Eye exams (Diabetes Mellitus)	A dilated eye exam in the previous two years. Damage to the small blood vessels in the eyes (also called retinopathy) is a complication of diabetes that can lead to blindness. Some clinical practice guidelines recommend that adults with type 2 diabetes have their eyes tested every one to two years	Canadian Diabetes Association Clinical Practice Guidelines Expert Committee, Canadian Diabetes Association 2008 Clinical Practice Guidelines for the Prevention and Management of Diabetes in Canada, Canadian Journal of Diabetes 32 Suppl. (September 2008). A. Allen and C. Rea, Type 2 Diabetes: Living With the Disease, last updated November 14, 2007, cited June 15, 2009, from <http://www.healthlinkbc.ca/kbase/topic/special/uq1114/sec9.htm>.	Statistics Canada (January 1, 2007-December 31, 2007)	Underuse (34.00%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
			if there are no signs of retinopathy. People with type 1 diabetes for more than five years should be screened annually if there are no signs of retinopathy.	National Collaborating Centre for Chronic Conditions, Type 2 Diabetes: The Management of Type 2 Diabetes, last updated May 2008, cited June 30, 2009, from <http://www.nice.org.uk/nicemedia/pdf/CG66NICEGuideline.pdf>.		
Canadian Institute for Health Information, 2009	Diagnostics (Assessments)	Foot exams (Diabetes Mellitus)	A foot exam for sores or irritation by a health professional in the previous year.	Canadian Diabetes Association Clinical Practice Guidelines Expert Committee, Canadian Diabetes Association 2008 Clinical Practice Guidelines for the Prevention and Management of Diabetes in Canada, Canadian Journal of Diabetes 32 Suppl. (September 2008). A. Allen and C. Rea, Type 2 Diabetes: Living With the Disease, last updated November 14, 2007, cited June 15, 2009, from <http://www.healthlinkbc.ca/kbase/topic/special/uq1114/sec9.htm>. National Collaborating Centre for Chronic Conditions, Type 2 Diabetes: The Management of Type 2 Diabetes, last updated May 2008, cited June 30, 2009, from <http://www.nice.org.uk/nicemedia/pdf/CG66NICEGuideline.pdf>.	Statistics Canada (January 1, 2007-December 31, 2007)	Underuse (49.00%)
Canadian Institute for Health Information, 2009	Diagnostics (Laboratory tests (non-blood tests))	Urine protein (Diabetes Mellitus)	A urine test for protein in the previous year. Diabetes can cause kidney damage (also called nephropathy), resulting in kidneyfailure requiring dialysis or kidney transplant. Individuals with type 2 diabetes should be screened at diagnosis and every 12 months thereafter using a urine test for	Canadian Diabetes Association Clinical Practice Guidelines Expert Committee, Canadian Diabetes Association 2008 Clinical Practice Guidelines for the Prevention and Management of Diabetes in Canada, Canadian Journal of Diabetes 32 Suppl. (September 2008). A. Allen and C. Rea, Type 2 Diabetes: Living With the Disease, last updated November 14, 2007, cited June 15, 2009, from <http://www.healthlinkbc.ca/kbase/topic/special/uq1114/sec9.htm>.	Statistics Canada (January 1, 2007-December 31, 2007)	Underuse (26.00%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
			microalbuminuria. It is recommended that individuals with type 1 diabetes for more than five years be screened annually. Individuals with diabetes and kidney disease should be tested at least every six months.	National Collaborating Centre for Chronic Conditions, Type 2 Diabetes: The Management of Type 2 Diabetes, last updated May 2008, cited June 30, 2009, from <http://www.nice.org.uk/nicemedia/pdf/CG66NICEGuideline.pdf>.		
Canadian Institute for Health Information, 2011	*Therapeutics (Multiple medication results)*	Potentially Inappropriate Medications-medications not specified (Studies of Potentially Inappropriate Medications)	The Beers list is an internationally recognized list of drugs that have been identified as potentially inappropriate to prescribe to seniors because they "are either ineffective or they pose unnecessarily high risk for older persons and a safer alternative is available.	Beers MH, et al., "Explicit Criteria for Determining Inappropriate Medication Use in Nursing Home Residents," Archives of Internal Medicine 151 (1991): pp. 1825–1832. Beers, MH, "Explicit Criteria for Determining Potentially Inappropriate Medication Use by Elderly. An Update," Archives of Internal Medicine 157 (1997): pp. 1531–1536. Fick DM, et al., "Updating the Beers Criteria for Potentially Inappropriate Medication Use in Older Adults," Archives of Internal Medicine 163, 22 (2003): pp. 2716–2724.	National Prescription Drug Utilization Information System Database; Canadian Institute for Health Information (January 1, 2009-December 31, 2009)	Overuse (13.50%)
Canadian Institute for Health Information, 2014	*Therapeutics (Multiple medication results)*	Potentially Inappropriate Medications-medications not specified (Studies of Potentially Inappropriate Medications)	These drugs are identified as potentially inappropriate to prescribe to seniors due to an elevated risk of adverse effects, a lack of efficacy in seniors or the availability of safer alternatives. This analysis used the most recent version of the list, which was updated in 2012 by The American Geriatrics Society (AGS). In an effort to make the	Clatney L, et al. Improving the Quality of Drug Management of Saskatchewan Seniors Living in the Community. Saskatoon, SK: Health Quality Council; 2005. American Geriatric Society. American Geriatric Society Updated Beers Criteria for Potentially Inappropriate Medication Use in Older Adults. New York, N.Y.: JAGS, 2012. Accessed on March 10, 2014, from <http://www.americangeriatrics.org/health_care_professionals/clinical_practice/clinical_guidelines_recommendations/2012>. Gallagher P, et al. "STOPP (Screening tool of older person's prescriptions) and START (Screening tool	National Prescription Drug UtilizationInformation System Database (2012-2013)	Overuse (38.90%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
			measure of potentially inappropriate use more applicable to the Canadian market for this analysis, all benzodiazepine and benzodiazepine-related products were identified as potentially inappropriate, not only those explicitly listed in the Beers list (see Appendix B). This modification is based on work by the Saskatchewan Health Quality Council.	to alert doctors to right treatment).” International Journal of Clinical Pharmacology & Therapeutics (February 2008): 46(2) pp. 72-83. Lam M, et al. “The use of STOPP/START criteria as a screening tool for assessing the appropriateness of medications in the elderly population.” Expert Review of Clinical Pharmacology (March 2012): 5(2) pp.187.		
Canadian Institute for Health Information, 2017	Therapeutics (Medications)	Benzodiazepines-medication(s) not specified (Sedative-hypnotics for Insomnia, Agitation or Delirium)	Don’t use benzodiazepines and/or other sedative–hypnotics in older adults as the first choice for insomnia, agitation or delirium.	College of Family Physicians of Canada/Canadian Medical Association and Canadian Association of Radiologists Canadian Academy of Geriatric Psychiatry, Canadian Academy of Child and Adolescent Psychiatry and Canadian Psychiatric Association Canadian Geriatrics Society and Canadian Society of Hospital Medicine Canadian Society of Internal Medicine, Canadian Anesthesiologists’ Society and Canadian Cardiovascular Society Canadian Association of Radiologists and Canadian Association of Emergency Physicians Canadian Society of Hospital Medicine Canadian Society of Internal Medicine	Hospital Morbidity Database; National Ambulatory Care Reporting System; National Physician Database; National Prescription Drug Utilization Information System Database; Statistics Canada; Discharge Abstract Database (2008-2016)	Overuse (11.10%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
Canadian Institute for Health Information, 2017	Diagnostics (Screening)	Mammography (Breast Cancer (Screening))	Don't routinely do screening mammography for average-risk women aged 40 to 49.	College of Family Physicians of Canada/Canadian Medical Association and Canadian Association of Radiologists Canadian Academy of Geriatric Psychiatry, Canadian Academy of Child and Adolescent Psychiatry and Canadian Psychiatric Association Canadian Geriatrics Society and Canadian Society of Hospital Medicine Canadian Society of Internal Medicine, Canadian Anesthesiologists' Society and Canadian Cardiovascular Society Canadian Association of Radiologists and Canadian Association of Emergency Physicians Canadian Society of Hospital Medicine Canadian Society of Internal Medicine	Hospital Morbidity Database; National Ambulatory Care Reporting System; National Physician Database; National Prescription Drug Utilization Information System Database; Statistics Canada; Discharge Abstract Database (2008-2016)	Overuse (25.80%)
Canadian Institute for Health Information, 2017	Diagnostics (Imaging)	Computed Tomography or Magnetic Resonance Imaging-Lower Spine (Lower Back Pain)	Don't do MRI imaging for lower-back pain unless red flags are present.	College of Family Physicians of Canada/Canadian Medical Association and Canadian Association of Radiologists Canadian Academy of Geriatric Psychiatry, Canadian Academy of Child and Adolescent Psychiatry and Canadian Psychiatric Association Canadian Geriatrics Society and Canadian Society of Hospital Medicine Canadian Society of Internal Medicine, Canadian Anesthesiologists' Society and Canadian Cardiovascular Society Canadian Association of Radiologists and Canadian Association of Emergency Physicians	Hospital Morbidity Database; National Ambulatory Care Reporting System; National Physician Database; National Prescription Drug Utilization Information System	Overuse (4.00%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				Canadian Society of Hospital Medicine Canadian Society of Internal Medicine	Database; Statistics Canada; Discharge Abstract Database (2008-2016)	
Canadian Institute for Health Information, 2017	Diagnostics (Imaging)	Computed Tomography or Magnetic Resonance Imaging-Lower Spine (Lower Back Pain)	Don't do CT imaging for lower-back pain unless red flags are present.	College of Family Physicians of Canada/Canadian Medical Association and Canadian Association of Radiologists Canadian Academy of Geriatric Psychiatry, Canadian Academy of Child and Adolescent Psychiatry and Canadian Psychiatric Association Canadian Geriatrics Society and Canadian Society of Hospital Medicine Canadian Society of Internal Medicine, Canadian Anesthesiologists' Society and Canadian Cardiovascular Society Canadian Association of Radiologists and Canadian Association of Emergency Physicians Canadian Society of Hospital Medicine Canadian Society of Internal Medicine	Hospital Morbidity Database; National Ambulatory Care Reporting System; National Physician Database; National Prescription Drug Utilization Information System Database; Statistics Canada; Discharge Abstract Database (2008-2016)	Overuse (1.60%)
Canadian Institute for Health Information, 2017	Diagnostics (Imaging)	Computed Tomography-Head (Delirium)	Don't routinely obtain head CT scans in hospitalized patients with delirium in the absence of risk factors.	College of Family Physicians of Canada/Canadian Medical Association and Canadian Association of Radiologists Canadian Academy of Geriatric Psychiatry, Canadian Academy of Child and Adolescent Psychiatry and Canadian Psychiatric Association Canadian Geriatrics Society and Canadian Society of Hospital Medicine	Hospital Morbidity Database; National Ambulatory Care Reporting System; National Physician	Overuse (24.20%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				Canadian Society of Internal Medicine, Canadian Anesthesiologists' Society and Canadian Cardiovascular Society Canadian Association of Radiologists and Canadian Association of Emergency Physicians Canadian Society of Hospital Medicine Canadian Society of Internal Medicine	Database; National Prescription Drug Utilization Information System Database; Statistics Canada; Discharge Abstract Database (2008-2016)	
Canadian Institute for Health Information, 2017	*Diagnostics (Multiple Diagnostics)*	Electrocardiogram, Cardiac Stress Test, Echocardiogram, Chest X-ray (Preoperative Testing (low-risk surgeries))	Don't perform preoperative testing before low-risk surgeries. Preoperative testing was defined as having an electrocardiogram (ECG), cardiac stress test, echocardiogram or chest X-ray.	College of Family Physicians of Canada/Canadian Medical Association and Canadian Association of Radiologists Canadian Academy of Geriatric Psychiatry, Canadian Academy of Child and Adolescent Psychiatry and Canadian Psychiatric Association Canadian Geriatrics Society and Canadian Society of Hospital Medicine Canadian Society of Internal Medicine, Canadian Anesthesiologists' Society and Canadian Cardiovascular Society Canadian Association of Radiologists and Canadian Association of Emergency Physicians Canadian Society of Hospital Medicine Canadian Society of Internal Medicine	Hospital Morbidity Database; National Ambulatory Care Reporting System; National Physician Database; National Prescription Drug Utilization Information System Database; Statistics Canada; Discharge Abstract Database (2008-2016)	Overuse (25.10%)
Canadian Institute for Health	*Diagnostics (Multiple*	Head Scans (Brain/Cranial X-rays, Computed	Don't do imaging for minor head trauma	College of Family Physicians of Canada/Canadian Medical Association and Canadian Association of Radiologists	Hospital Morbidity Database;	Overuse (28.90%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
Information, 2017	*imaging results)*	Tomography, Magnetic Resonance Imaging) (Minor Head Trauma)	unless red flags are present.	Canadian Academy of Geriatric Psychiatry, Canadian Academy of Child and Adolescent Psychiatry and Canadian Psychiatric Association Canadian Geriatrics Society and Canadian Society of Hospital Medicine Canadian Society of Internal Medicine, Canadian Anesthesiologists' Society and Canadian Cardiovascular Society Canadian Association of Radiologists and Canadian Association of Emergency Physicians Canadian Society of Hospital Medicine Canadian Society of Internal Medicine	National Ambulatory Care Reporting System; National Physician Database; National Prescription Drug Utilization Information System Database; Statistics Canada; Discharge Abstract Database (2008-2016)	
Canadian Institute for Health Information, 2017	Therapeutics (Medications)	Quetiapine (Insomnia (children))	Don't use atypical antipsychotics as a first line intervention for insomnia in children and youth.	College of Family Physicians of Canada/Canadian Medical Association and Canadian Association of Radiologists Canadian Academy of Geriatric Psychiatry, Canadian Academy of Child and Adolescent Psychiatry and Canadian Psychiatric Association Canadian Geriatrics Society and Canadian Society of Hospital Medicine Canadian Society of Internal Medicine, Canadian Anesthesiologists' Society and Canadian Cardiovascular Society Canadian Association of Radiologists and Canadian Association of Emergency Physicians Canadian Society of Hospital Medicine	Hospital Morbidity Database; National Ambulatory Care Reporting System; National Physician Database; National Prescription Drug Utilization Information System Database; Statistics Canada;	Overuse (0.15%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				Canadian Society of Internal Medicine	Discharge Abstract Database (2008-2016)	
Canadian Institute for Health Information, 2018	*Therapeutics (Multiple medication results)*	Potentially Inappropriate Medications-medications not specified (Studies of Potentially Inappropriate Medications)	The Beers list separates potentially inappropriate drugs for seniors into 3 groups: drugs that are regarded as potentially inappropriate, drugs that are inappropriate for use in seniors due to drug–disease or drug–syndrome interactions and drugs that should be taken with caution. This analysis included only drugs that are regarded as potentially inappropriate according to the Beers list. It should be noted that some drugs regarded as potentially inappropriate on the updated Beers list used in this report are considered potentially inappropriate for only a specific use or if they are prescribed in a certain way. Because information related to the reason for the prescription or details on how the drugs are prescribed are not available in NPDUIS, all drug claims in these cases were identified as	American Geriatrics Society 2015 Beers Criteria Update Expert Panel. American Geriatrics Society 2015 updated Beers criteria for potentially inappropriate medication use in older adults. Journal of the American Geriatrics Society. November 2015.	Health Canada's First Nations and Inuit Health Branch; National Prescription Drug Utilization Information System; Canadian Institute for Health Information; Banque médicaments; Régie de l'assurance maladie du Québec. (2011-2012; 2016-2017)	Overuse (76.50%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
			potentially inappropriate.			
Canadian Partnership Against Cancer, 2017	Diagnostics (Screening)	Fecal Occult Blood Test (Colorectal Cancer (screening))	Guidelines recommend that adults aged 50 to 74 at average risk for colorectal cancer should receive a fecal test in the past two years for colorectal cancer screening.	Canadian Task Force on Preventive Health Care. Recommendations on screening for colorectal cancer in primary care. CMAJ. 2016 Mar 15;188(5):340–8 Rabeneck L, Rumble RB, Thompson F, Mills M, Oleschuk C, Whibley A, et al. Fecal immunochemical tests compared with guaiac fecal occult blood tests for population-based colorectal cancer screening. Can J Gastroenterol Hepatol. 2012;26(3):131–47. Canadian Partnership Against Cancer. Quality Determinants and Indicators for Measuring Colorectal Cancer Screening Program Performance in Canada. Toronto: The Partnership, 2012.	National Colorectal Cancer Screening Network (2013-2015)	Underuse (49-87.9%)
Chan, 2018	*Diagnostics (Multiple Diagnostics)*	Skin Cancer Assessment (Annual dermatology exam (Skin Cancer)	National and international guidelines for posttransplant care recommend annual dermatology assessments to screen for skin cancer and educate patients about sun protection.	Acuna SA, Huang JW, Scott AL, et al. Cancer screening recommendations for solid organ transplant recipients: a systematic review of clinical practice guidelines. Am J Transplant. 2017;17(1):103-114.	Ontario Health Insurance Plan; CanadianInstitute for Health Information; Ontario Registrar General Death database; Registered Persons Database; ICES Physician Database (January 1, 2007 - December 31, 2012)	Underuse (67.30%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
Chen, 2019	Therapeutics (Medications)	Statins- Drug Unknown (CVD)	Recommendations indicate that statins should be prescribed for the management of dyslipidemia and the prevention of cardiovascular disease in adults, The suggested treatment approach is to achieve LDL-C levels that are consistently < 2.0 mmol/L or to achieve a 50% reduction in LDL-C.	Anderson TJ, Gregoire J, Pearson GJ, et al. 2016 Canadian Cardiovascular Society guidelines for the management of dyslipidemia for the prevention of cardiovascular disease in the adult. Can J Cardiol 2016; 32:1263-82.	Discharge Abstract Database; National Ambulatory Care Reporting System; Practitioner Claims data; Alberta Health Care Insurance Plan; Pharmaceutical Information Network; Calgary Laboratory Services data (Millennium/ Pathnet Calgary Laboratory Services, Sunquest Edmonton Laboratory Services, and Meditech Laboratory Services data) (April 1, 2010 - March 31, 2017)	Underuse (37.40%)
Cheng, 2019	Therapeutics (Medications)	Cancer-Radium-223 (Prostate Cancer)	Not explicitly provided in study; from results, recommendation: patients with prostate cancer with metastases to the bones should	Fizazi K, Carducci M, Smith M, et al. Denosumab versus zoledronic acid for treatment of bone metastases in men with castration-resistant prostate cancer: a randomised, double-blind study. Lancet. 2011;377 (9768):813–822. doi:10.1016/S0140-6736(10)62344-6	Sunnybrook Research Institute; Juravinski Hospital; Durham	Underuse (53.50%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
			receive at least 6 cycles of completed-radium-223 (Ra223) cycles during their treatment.	Sartor O, de Bono JS. Metastatic prostate cancer. N Engl J Med. 2018;378(7):645–657. doi:10.1056/NEJMra1701695 Parker C, Nilsson S, Heinrich D, et al. Alpha emitter radium-223 and survival in metastatic prostate cancer. N Engl J Med. 2013;369(3):213–223. doi:10.1056/NEJMoa1213755 2.	Regional Cancer Centre; Princess Margaret Cancer Centre (January 2015 - October 2016)	
Chin, 2016	Therapeutics (Medications)	Antimicrobials--medication(s) not specified (Ventilator-Associated Pneumonia)	For antibiotics that were not listed on the sensitivity report, the Calgary Zone regional antibiogram reflective of the most current susceptibility profiles at the time of the patient's ICU admission was used to determine appropriateness, if available. For antibiotic therapy not reported in the sensitivity report or the regional antibiogram, Sanford's Guide to Antibiotic Therapy was used to evaluate appropriateness. Therapy was considered "inappropriate" if one or more pathogens were not sensitive to any of the antibiotics currently being administered.	C. Rotstein, G. Evans, A. Born et al., "Clinical practice guidelines for hospital-acquired pneumonia and ventilator associated pneumonia in adults," Canadian Journal of Infectious Diseases and Medical Microbiology, vol. 19, no. 1, pp. 19–53, 2008. M. H. Kollef, L. E. Morrow, M. S. Niederman et al., "Clinical characteristics and treatment patterns among patients with ventilator-associated pneumonia," Chest, vol. 129, no. 5, pp. 1210–1218, 2006. D. N. Gilbert, R. C. Moellering Jr., G. M. Eliopoulos, H. F. Chambers, and M. S. Saag, Eds., The Sanford Guide to Antimicrobial Therapy, Antimicrobial Therapy, Sperryville, Va, USA, 2010.	VAP surveillance program (April 1, 2007-May 31, 2010)	Overuse (76.00%)
Clemens, 2016	Therapeutics (Medications)	Antihyperglycemics-medication(s) not specified (Diabetes Mellitus	Clinical practice guidelines have suggested that glyburide be avoided because of its hypoglycaemia risk	Found: Supplemental file, Table S1 Abaterusso C, Lupo A, Ortalda V, De Biase V, Pani A, Muggeo M, Gambaro G: Treating elderly people with diabetes and stages 3 and 4 chronic kidney disease. Clin. J. Am. Soc.Nephrol. 2008; 3: 1185-1194.	The Registered Persons Database of Ontario;	Overuse (21.00%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
		and Chronic Kidney Disease)	in patients with both Diabetes Mellitus and Chronic Kidney Disease.	Abe M, Okada K, Soma M: Antidiabetic agents in patients with chronic kidney disease and end-stage renal disease on dialysis: metabolism and clinical practice. Curr. Drug Metab. 2011; 12: 57-69. Clinical practice guideline on management of patients with diabetes and chronic kidney disease stage 3b or higher. Nephrol. Dial. Transplant 2015; 30: ii1-1142. Harper W, Clement M, Goldenberg R, Hanna A, Main A, Retnakaran R, Sherifali D, Woo V, Yale JF: Canadian Diabetes Association Guidelines – Pharmacologic management of type 2 diabetes. [Internet]. 2013 Available from: http://guidelines.diabetes.ca/Browse/Chapter13 KDOQI Clinical Practice Guideline for Diabetes and CKD: 2012 Update. Am. J. Kidney Dis. 2012; 60: 850-86. Meinelly G: Canadian Diabetes Association Guidelines: Diabetes in the Elderly [Internet]. Can. Diabetes Assoc. 2013 Available from: http://guidelines.diabetes.ca/Browse/Chapter 37	Ontario Drug Benefit Program database; Discharge Abstract Database; the National Ambulatory Care Reporting System Database; Ontario Health Insurance Plan database; the Ontario Diabetes Database (January 1, 2007 - December 31, 2008; January 1, 2008 - December 31, 2008; January 1, 2009 - December 31, 2009; January 1, 2010 - December 31, 2010; January 1, 2011 - December 31, 2011; January 1, 2012 - December 31, 2012; January 1, 2013 -	

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
					March 31, 2013)	
Cohen, 2019	Diagnostics (Imaging)	Computed Tomography-Abd (Constipation)	Abdominal Computed Tomographic (CT) imaging is not recommended for patients diagnosed with constipation.	American Academy of Pediatrics. Ten things physicians and patients should question. http://www.choosingwisely.org/societies/americanacademy-of-pediatrics/. Published February 21, 2013. Accessed February 19, 2019. Canadian Association of Emergency Physicians. Ten things physicians and patients should question. https://choosingwiselycanada.org/emergencymedicine/. Published March 2018. Accessed February 19, 2019 Horner KB, Jones A, Wang L, Winger DG, Marin JR. Variation in advanced imaging for pediatric patients with abdominal pain discharged from the ED. Am J Emerg Med. 2016;34(12):2320-2325. doi: 10.1016/j.ajem.2016.08.041 Ralston SL, Lieberthal AS, Meissner HC, et al; American Academy of Pediatrics. Clinical practice guideline: the diagnosis, management, and prevention of bronchiolitis. Pediatrics. 2014;134(5): e1474-e1502. doi:10.1542/peds.2014-2742	the National Ambulatory Care Reporting System; The Ontario Health Insurance Plan database; Canadian Institute for Health Information Discharge Abstract Database; The Ontario Registered Persons Database (January 1, 2016 - December 31, 2016)	Overuse (0.10%)
Cohen, 2019	Diagnostics (Imaging)	Computed Tomography-Abd (Abdominal pain)	Abdominal Computed Tomographic (CT) imaging is not recommended for patients diagnosed with abdominal pain.	American Academy of Pediatrics. Ten things physicians and patients should question. http://www.choosingwisely.org/societies/americanacademy-of-pediatrics/. Published February 21, 2013. Accessed February 19, 2019. Canadian Association of Emergency Physicians. Ten things physicians and patients should question. https://choosingwiselycanada.org/emergencymedicine/. Published March 2018. Accessed February 19, 2019 Horner KB, Jones A, Wang L, Winger DG, Marin JR. Variation in advanced imaging for pediatric patients with abdominal pain discharged from the ED. Am J	the National Ambulatory Care Reporting System; The Ontario Health Insurance Plan database; Canadian Institute for Health Information Discharge Abstract	Overuse (0.50%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				Emerg Med. 2016;34(12):2320-2325. doi: 10.1016/j.ajem.2016.08.041 Ralston SL, Lieberthal AS, Meissner HC, et al; American Academy of Pediatrics. Clinical practice guideline: the diagnosis, management, and prevention of bronchiolitis. Pediatrics. 2014;134(5): e1474-e1502. doi:10.1542/peds.2014-2742	Database; The Ontario Registered Persons Database (January 1, 2016 - December 31, 2016)	
Cohen, 2019	Diagnostics (Imaging)	Computed Tomography-Head (Febrile Convulsion)	Evidence sources do not recommend head computed tomographic scans for patients diagnosed with febrile convulsion (simple).	American Academy of Pediatrics. Ten things physicians and patients should question. http://www.choosingwisely.org/societies/americanacademy-of-pediatrics/. Published February 21, 2013. Accessed February 19, 2019. Canadian Association of Emergency Physicians. Ten things physicians and patients should question. https://choosingwiselycanada.org/emergencymedicine/. Published March 2018. Accessed February 19, 2019 Horner KB, Jones A, Wang L, Winger DG, Marin JR. Variation in advanced imaging for pediatric patients with abdominal pain discharged from the ED. Am J Emerg Med. 2016;34(12):2320-2325. doi: 10.1016/j.ajem.2016.08.041 Ralston SL, Lieberthal AS, Meissner HC, et al; American Academy of Pediatrics. Clinical practice guideline: the diagnosis, management, and prevention of bronchiolitis. Pediatrics. 2014;134(5): e1474-e1502. doi:10.1542/peds.2014-2742	the National Ambulatory Care Reporting System; The Ontario Health Insurance Plan database; Canadian Institute for Health Information Discharge Abstract Database; The Ontario Registered Persons Database (January 1, 2016 - December 31, 2016)	Overuse (0.50%)
Cohen, 2019	Diagnostics (Imaging)	Computed Tomography-Head (Febrile Convulsion)	Evidence sources do not recommend head computed tomographic scans for patients diagnosed with febrile convulsion (complex).	American Academy of Pediatrics. Ten things physicians and patients should question. http://www.choosingwisely.org/societies/americanacademy-of-pediatrics/. Published February 21, 2013. Accessed February 19, 2019. Canadian Association of Emergency Physicians. Ten things physicians and patients should question.	the National Ambulatory Care Reporting System; The Ontario Health Insurance	Overuse (6.10%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				https://choosingwiselycanada.org/emergencymedicine/. Published March 2018. Accessed February 19, 2019 Horner KB, Jones A, Wang L, Winger DG, Marin JR. Variation in advanced imaging for pediatric patients with abdominal pain discharged from the ED. Am J Emerg Med. 2016;34(12):2320-2325. doi: 10.1016/j.ajem.2016.08.041 Ralston SL, Lieberthal AS, Meissner HC, et al; American Academy of Pediatrics. Clinical practice guideline: the diagnosis, management, and prevention of bronchiolitis. Pediatrics. 2014;134(5): e1474-e1502. doi:10.1542/peds.2014-2742	Plan database; Canadian Institute for Health Information Discharge Abstract Database; The Ontario Registered Persons Database (January 1, 2016 - December 31, 2016)	
Cohen, 2019	Diagnostics (Imaging)	Computed Tomography-Head (Headache)	Evidence sources do not recommend head computed tomographic scans for patients diagnosed with headaches.	American Academy of Pediatrics. Ten things physicians and patients should question. http://www.choosingwisely.org/societies/americanacademy-of-pediatrics/. Published February 21, 2013. Accessed February 19, 2019. Canadian Association of Emergency Physicians. Ten things physicians and patients should question. https://choosingwiselycanada.org/emergencymedicine/. Published March 2018. Accessed February 19, 2019 Horner KB, Jones A, Wang L, Winger DG, Marin JR. Variation in advanced imaging for pediatric patients with abdominal pain discharged from the ED. Am J Emerg Med. 2016;34(12):2320-2325. doi: 10.1016/j.ajem.2016.08.041 Ralston SL, Lieberthal AS, Meissner HC, et al; American Academy of Pediatrics. Clinical practice guideline: the diagnosis, management, and prevention of bronchiolitis. Pediatrics. 2014;134(5): e1474-e1502. doi:10.1542/peds.2014-2742	the National Ambulatory Care Reporting System; The Ontario Health Insurance Plan database; Canadian Institute for Health Information Discharge Abstract Database; The Ontario Registered Persons Database (January 1, 2016 - December 31, 2016)	Overuse (8.50%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
Cohen, 2019	Diagnostics (Imaging)	Computed Tomography-Head (Seizure)	Evidence sources do not recommend head computed tomographic scans for patients diagnosed with seizures.	American Academy of Pediatrics. Ten things physicians and patients should question. http://www.choosingwisely.org/societies/americanacademy-of-pediatrics/. Published February 21, 2013. Accessed February 19, 2019. Canadian Association of Emergency Physicians. Ten things physicians and patients should question. https://choosingwiselycanada.org/emergencymedicine/. Published March 2018. Accessed February 19, 2019 Horner KB, Jones A, Wang L, Winger DG, Marin JR. Variation in advanced imaging for pediatric patients with abdominal pain discharged from the ED. Am J Emerg Med. 2016;34(12):2320-2325. doi: 10.1016/j.ajem.2016.08.041 Ralston SL, Lieberthal AS, Meissner HC, et al; American Academy of Pediatrics. Clinical practice guideline: the diagnosis, management, and prevention of bronchiolitis. Pediatrics. 2014;134(5): e1474-e1502. doi:10.1542/peds.2014-2742	the National Ambulatory Care Reporting System; The Ontario Health Insurance Plan database; Canadian Institute for Health Information Discharge Abstract Database; The Ontario Registered Persons Database (January 1, 2016 - December 31, 2016)	Overuse (6.20%)
Cohen, 2019	Diagnostics (Imaging)	Magnetic Resonance Imaging-Head (Concussion)	Evidence sources do not recommend head magnetic resonance imaging for patients diagnosed with concussion.	American Academy of Pediatrics. Ten things physicians and patients should question. http://www.choosingwisely.org/societies/americanacademy-of-pediatrics/. Published February 21, 2013. Accessed February 19, 2019. Canadian Association of Emergency Physicians. Ten things physicians and patients should question. https://choosingwiselycanada.org/emergencymedicine/. Published March 2018. Accessed February 19, 2019 Horner KB, Jones A, Wang L, Winger DG, Marin JR. Variation in advanced imaging for pediatric patients with abdominal pain discharged from the ED. Am J Emerg Med. 2016;34(12):2320-2325. doi: 10.1016/j.ajem.2016.08.041	the National Ambulatory Care Reporting System; The Ontario Health Insurance Plan database; Canadian Institute for Health Information Discharge Abstract Database; The Ontario	Overuse (0.40%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				Ralston SL, Lieberthal AS, Meissner HC, et al; American Academy of Pediatrics. Clinical practice guideline: the diagnosis, management, and prevention of bronchiolitis. Pediatrics. 2014;134(5): e1474-e1502. doi:10.1542/peds.2014-2742	Registered Persons Database (January 1, 2016 - December 31, 2016)	
Cohen, 2019	Diagnostics (Imaging)	Magnetic Resonance Imaging-Head (Headache)	Evidence sources do not recommend head magnetic resonance imaging for patients diagnosed with headaches.	American Academy of Pediatrics. Ten things physicians and patients should question. http://www.choosingwisely.org/societies/americanacademy-of-pediatrics/. Published February 21, 2013. Accessed February 19, 2019. Canadian Association of Emergency Physicians. Ten things physicians and patients should question. https://choosingwiselycanada.org/emergencymedicine/. Published March 2018. Accessed February 19, 2019 Horner KB, Jones A, Wang L, Winger DG, Marin JR. Variation in advanced imaging for pediatric patients with abdominal pain discharged from the ED. Am J Emerg Med. 2016;34(12):2320-2325. doi: 10.1016/j.ajem.2016.08.041 Ralston SL, Lieberthal AS, Meissner HC, et al; American Academy of Pediatrics. Clinical practice guideline: the diagnosis, management, and prevention of bronchiolitis. Pediatrics. 2014;134(5): e1474-e1502. doi:10.1542/peds.2014-2742	the National Ambulatory Care Reporting System; The Ontario Health Insurance Plan database; Canadian Institute for Health Information Discharge Abstract Database; The Ontario Registered Persons Database (January 1, 2016 - December 31, 2016)	Overuse (4.90%)
Cohen, 2019	Diagnostics (Imaging)	Magnetic Resonance Imaging-Head (Seizure)	Evidence sources do not recommend head magnetic resonance imaging for patients diagnosed with seizures.	American Academy of Pediatrics. Ten things physicians and patients should question. http://www.choosingwisely.org/societies/americanacademy-of-pediatrics/. Published February 21, 2013. Accessed February 19, 2019. Canadian Association of Emergency Physicians. Ten things physicians and patients should question. https://choosingwiselycanada.org/emergencymedicin	the National Ambulatory Care Reporting System; The Ontario Health Insurance Plan database; Canadian	Overuse (3.30%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				e/. Published March 2018. Accessed February 19, 2019 Horner KB, Jones A, Wang L, Winger DG, Marin JR. Variation in advanced imaging for pediatric patients with abdominal pain discharged from the ED. Am J Emerg Med. 2016;34(12):2320-2325. doi: 10.1016/j.ajem.2016.08.041 Ralston SL, Lieberthal AS, Meissner HC, et al; American Academy of Pediatrics. Clinical practice guideline: the diagnosis, management, and prevention of bronchiolitis. Pediatrics. 2014;134(5): e1474-e1502. doi:10.1542/peds.2014-2742	Institute for Health Information Discharge Abstract Database; The Ontario Registered Persons Database (January 1, 2016 - December 31, 2016)	
Cohen, 2019	Diagnostics (Imaging)	Radiography-Abd. (Abdominal pain)	Evidence sources do not recommend chest abdominal radiographic imaging for patients diagnosed with abdominal pain.	American Academy of Pediatrics. Ten things physicians and patients should question. http://www.choosingwisely.org/societies/americanacademy-of-pediatrics/. Published February 21, 2013. Accessed February 19, 2019. Canadian Association of Emergency Physicians. Ten things physicians and patients should question. https://choosingwiselycanada.org/emergencymedicine/. Published March 2018. Accessed February 19, 2019 Horner KB, Jones A, Wang L, Winger DG, Marin JR. Variation in advanced imaging for pediatric patients with abdominal pain discharged from the ED. Am J Emerg Med. 2016;34(12):2320-2325. doi: 10.1016/j.ajem.2016.08.041 Ralston SL, Lieberthal AS, Meissner HC, et al; American Academy of Pediatrics. Clinical practice guideline: the diagnosis, management, and prevention of bronchiolitis. Pediatrics. 2014;134(5): e1474-e1502. doi:10.1542/peds.2014-2742	the National Ambulatory Care Reporting System; The Ontario Health Insurance Plan database; Canadian Institute for Health Information Discharge Abstract Database; The Ontario Registered Persons Database (January 1, 2016 - December 31, 2016)	Overuse (13.20%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
Cohen, 2019	Diagnostics (Imaging)	Radiography-Abd. (Constipation)	Evidence sources do not recommend chest abdominal radiographic imaging for patients diagnosed with constipation.	American Academy of Pediatrics. Ten things physicians and patients should question. http://www.choosingwisely.org/societies/americanacademy-of-pediatrics/. Published February 21, 2013. Accessed February 19, 2019. Canadian Association of Emergency Physicians. Ten things physicians and patients should question. https://choosingwiselycanada.org/emergencymedicine/. Published March 2018. Accessed February 19, 2019 Horner KB, Jones A, Wang L, Winger DG, Marin JR. Variation in advanced imaging for pediatric patients with abdominal pain discharged from the ED. Am J Emerg Med. 2016;34(12):2320-2325. doi: 10.1016/j.ajem.2016.08.041 Ralston SL, Lieberthal AS, Meissner HC, et al; American Academy of Pediatrics. Clinical practice guideline: the diagnosis, management, and prevention of bronchiolitis. Pediatrics. 2014;134(5): e1474-e1502. doi:10.1542/peds.2014-2742	the National Ambulatory Care Reporting System; The Ontario Health Insurance Plan database; Canadian Institute for Health Information Discharge Abstract Database; The Ontario Registered Persons Database (January 1, 2016 - December 31, 2016)	Overuse (25.90%)
Cohen, 2019	Diagnostics (Imaging)	Radiography-Chest (Asthma)	Evidence sources do not recommend chest radiographic imaging for patients diagnosed with asthma.	American Academy of Pediatrics. Ten things physicians and patients should question. http://www.choosingwisely.org/societies/americanacademy-of-pediatrics/. Published February 21, 2013. Accessed February 19, 2019. Canadian Association of Emergency Physicians. Ten things physicians and patients should question. https://choosingwiselycanada.org/emergencymedicine/. Published March 2018. Accessed February 19, 2019 Horner KB, Jones A, Wang L, Winger DG, Marin JR. Variation in advanced imaging for pediatric patients with abdominal pain discharged from the ED. Am J Emerg Med. 2016;34(12):2320-2325. doi: 10.1016/j.ajem.2016.08.041	the National Ambulatory Care Reporting System; The Ontario Health Insurance Plan database; Canadian Institute for Health Information Discharge Abstract Database; The Ontario	Overuse (19.80%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				Ralston SL, Lieberthal AS, Meissner HC, et al; American Academy of Pediatrics. Clinical practice guideline: the diagnosis, management, and prevention of bronchiolitis. Pediatrics. 2014;134(5): e1474-e1502. doi:10.1542/peds.2014-2742	Registered Persons Database (January 1, 2016 - December 31, 2016)	
Cohen, 2019	Diagnostics (Imaging)	Radiography-Chest (Bronchiolitis)	Evidence sources do not recommend chest radiographic imaging for patients diagnosed with bronchilitis.	American Academy of Pediatrics. Ten things physicians and patients should question. http://www.choosingwisely.org/societies/americanacademy-of-pediatrics/. Published February 21, 2013. Accessed February 19, 2019. Canadian Association of Emergency Physicians. Ten things physicians and patients should question. https://choosingwiselycanada.org/emergencymedicine/. Published March 2018. Accessed February 19, 2019 Horner KB, Jones A, Wang L, Winger DG, Marin JR. Variation in advanced imaging for pediatric patients with abdominal pain discharged from the ED. Am J Emerg Med. 2016;34(12):2320-2325. doi: 10.1016/j.ajem.2016.08.041 Ralston SL, Lieberthal AS, Meissner HC, et al; American Academy of Pediatrics. Clinical practice guideline: the diagnosis, management, and prevention of bronchiolitis. Pediatrics. 2014;134(5): e1474-e1502. doi:10.1542/peds.2014-2742	the National Ambulatory Care Reporting System; The Ontario Health Insurance Plan database; Canadian Institute for Health Information Discharge Abstract Database; The Ontario Registered Persons Database (January 1, 2016 - December 31, 2016)	Overuse (19.10%)
Cohen, 2019	Diagnostics (Imaging)	Ultrasound-Abdominal (Abdominal pain)	Evidence sources do not recommend chest abdominal ultrasonographic imaging for patients diagnosed with abdominal pain.	American Academy of Pediatrics. Ten things physicians and patients should question. http://www.choosingwisely.org/societies/americanacademy-of-pediatrics/. Published February 21, 2013. Accessed February 19, 2019. Canadian Association of Emergency Physicians. Ten things physicians and patients should question. https://choosingwiselycanada.org/emergencymedicin	the National Ambulatory Care Reporting System; The Ontario Health Insurance Plan database; Canadian	Overuse (32.10%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				e/. Published March 2018. Accessed February 19, 2019 Horner KB, Jones A, Wang L, Winger DG, Marin JR. Variation in advanced imaging for pediatric patients with abdominal pain discharged from the ED. Am J Emerg Med. 2016;34(12):2320-2325. doi: 10.1016/j.ajem.2016.08.041 Ralston SL, Lieberthal AS, Meissner HC, et al; American Academy of Pediatrics. Clinical practice guideline: the diagnosis, management, and prevention of bronchiolitis. Pediatrics. 2014;134(5): e1474-e1502. doi:10.1542/peds.2014-2742	Institute for Health Information Discharge Abstract Database; The Ontario Registered Persons Database (January 1, 2016 - December 31, 2016)	
Cohen, 2019	Diagnostics (Imaging)	Ultrasound-Abdominal (Constipation)	Evidence sources do not recommend chest abdominal ultrasonographic imaging for patients diagnosed with constipation.	American Academy of Pediatrics. Ten things physicians and patients should question. http://www.choosingwisely.org/societies/americanacademy-of-pediatrics/. Published February 21, 2013. Accessed February 19, 2019. Canadian Association of Emergency Physicians. Ten things physicians and patients should question. https://choosingwiselycanada.org/emergencymedicine/. Published March 2018. Accessed February 19, 2019 Horner KB, Jones A, Wang L, Winger DG, Marin JR. Variation in advanced imaging for pediatric patients with abdominal pain discharged from the ED. Am J Emerg Med. 2016;34(12):2320-2325. doi: 10.1016/j.ajem.2016.08.041 Ralston SL, Lieberthal AS, Meissner HC, et al; American Academy of Pediatrics. Clinical practice guideline: the diagnosis, management, and prevention of bronchiolitis. Pediatrics. 2014;134(5): e1474-e1502. doi:10.1542/peds.2014-2742	the National Ambulatory Care Reporting System; The Ontario Health Insurance Plan database; Canadian Institute for Health Information Discharge Abstract Database; The Ontario Registered Persons Database (January 1, 2016 - December 31, 2016)	Overuse (6.10%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
Daley, 2018	Therapeutics (Medications)	Antimicrobials--medication(s) not specified (Asymptomatic Bacteriuria)	Guidelines do not recommend that antibiotics are prescribed for Asymptomatic Bacteriuria (ASB).	Zalmanovici Trestioreanu A, Lador A, Sauerbrun-Cutler MT, Leibovici L. Antibiotics for asymptomatic bacteriuria. Cochrane Database Syst Rev 2015;4:CD009534. Nicolle LE, Bradley S, Colgan R, et al. Infectious Diseases Society of America guidelines for the diagnosis and treatment of asymptomatic bacteriuria in adults. Clin Infect Dis 2005; 40:643–654	The Health Sciences Center; St Clare's Mercy Hospital (January 3, 2017 - March 27, 2017)	Overuse (41.50%)
De Silva, 2018	Therapeutics (Medications)	Magnesium Sulphate (Fetal Neuroprotection)	Use of MgSO4 for fetal NP-'Suboptimal Use' was defined as administration of MgSO4 for fetal NP when not indicated, either when birth did not occur within 24 h at < 32 weeks (and 0 days) or birth occurred at ≥ 32 weeks (and 0 days).	Conde-Agudelo A. Antenatal magnesium sulfate for the prevention of cerebral palsy in preterm infants less than 34 weeks' gestation: a systematic review and metaanalysis. Am J Obstet Gynecol. 2009; 200:595–609. https://doi.org/10.1016/j.ajog.2009.04.005. Costantine MM, Weiner SJ, Eunice Kennedy Shriver National Institute of Child Health and Human Development Maternal-Fetal Medicine Units Network. Effects of antenatal exposure to magnesium sulfate on neuroprotection and mortality in preterm infants: a meta-analysis. Obstet Gynecol 2009; 114:354-364 doi: https://doi.org/10.1097/AOG.0b013e3181ae98c2. Doyle LW, Crowther CA, Middleton P, et al. Magnesium sulphate for women at risk of preterm birth for neuroprotection of the fetus. Cochrane Database Syst Rev. 2009:CD004661. https://doi.org/10.1002/14651858.CD004661.pub3. Magee L, Sawchuck D, Synnes A, et al. SOGC Clinical Practice Guideline. Magnesium sulphate for fetal neuroprotection. J Obstet Gynaecol Can 2011; 33:516-529 doi: S1701–2163(16)34886–1 [pii]. American College of Obstetricians and Gynecologists Committee on Obstetric Practice, Society for Maternal-Fetal Medicine. Committee opinion no. 455: magnesium sulfate before anticipated preterm	Canadian Perinatal Network; Canadian Neonatal Network (June 2011 - Sept 2015)	Overuse (9.30%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				birth for neuroprotection. Obstet Gynecol. 2010; 115:669–71. https://doi.org/10.1097/ AOG.0b013e3181d4ffa5. The Antenatal Magnesium Sulphate for Neuroprotection Guideline Development Panel. Antenatal magnesium sulphate prior to preterm birth for neuroprotection of the fetus, infant and child: national clinical practice guidelines. Adelaide: The University of Adelaide; 2010. Available at: https:// www.adelaide.edu.au/arch/antenatalMagnesiumSulphateGuidlines.pdf. Accessed 1 Feb 2017. Royal College of Obstetricians & Gynaecologists. Magnesium sulphate to prevent cerebral palsy following preterm birth. Available at: https://www.rcog.org.uk/globalassets/documents/guidelines/scientific-impact-papers/sip_ 29.pdf. Accessed 1 Feb 2017.		
De Silva, 2018	Therapeutics (Medications)	Magnesium Sulphate (Pregnancy- Fetal Neuroprotection)	Use of MgSO4 for fetal NP- 'Underuse' was defined as failure to administer MgSO4 for fetal NP when indicated (i.e., for birth that occurred within 24 h of admission to hospital at < 32 weeks (and 0 days)	Conde-Agudelo A. Antenatal magnesium sulfate for the prevention of cerebral palsy in preterm infants less than 34 weeks' gestation: a systematic review and metaanalysis. Am J Obstet Gynecol. 2009; 200:595–609. https:// doi.org/10.1016/j.ajog.2009.04.005. Costantine MM, Weiner SJ, Eunice Kennedy Shriver National Institute of Child Health and Human Development Maternal-Fetal Medicine Units Network. Effects of antenatal exposure to magnesium sulfate on neuroprotection and mortality in preterm infants: a meta-analysis. Obstet Gynecol 2009; 114:354-364 doi: https://doi.org/10.1097/AOG.0b013e3181ae98c2. Doyle LW, Crowther CA, Middleton P, et al. Magnesium sulphate for women at risk of preterm birth for neuroprotection of the fetus. Cochrane Database Syst Rev. 2009:CD004661. https://doi.org/10.1002/14651858.CD004661.pub3.	Canadian Perinatal Network; Canadian Neonatal Network (June 2011 - Sept 2015)	Underuse (23.60%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				Magee L, Sawchuck D, Synnes A, et al. SOGC Clinical Practice Guideline. Magnesium sulphate for fetal neuroprotection. J Obstet Gynaecol Can 2011; 33:516-529 doi: S1701–2163(16)34886–1 [pii]. American College of Obstetricians and Gynecologists Committee on Obstetric Practice, Society for Maternal-Fetal Medicine. Committee opinion no. 455: magnesium sulfate before anticipated preterm birth for neuroprotection. Obstet Gynecol. 2010; 115:669–71. https://doi.org/10.1097/ AOG.0b013e3181d4ffa5. The Antenatal Magnesium Sulphate for Neuroprotection Guideline Development Panel. Antenatal magnesium sulphate prior to preterm birth for neuroprotection of the fetus, infant and child: national clinical practice guidelines. Adelaide: The University of Adelaide; 2010. Available at: https:// www.adelaide.edu.au/arch/antenatalMagnesiumSulphateGuidlines.pdf. Accessed 1 Feb 2017. Royal College of Obstetricians & Gynaecologists. Magnesium sulphate to prevent cerebral palsy following preterm birth. Available at: https://www.rcog.org.uk/globalassets/documents/guidelines/scientific-impact-papers/sip_ 29.pdf. Accessed 1 Feb 2017.		
Diamant, 2019	Therapeutics (Medications)	Multiple Medications (Cardiovascular) (CVD)	Guideline-directed medical therapy (GDMT) in heart failure with reduced ejection fraction (HFrEF) includes angiotensin converting enzyme inhibitors (ACE-I) or angiotensin receptor blockers (ARBs), beta-blockers, and	WRITING COMMITTEE MEMBERS, Yancy CW, Jessup M, Bozkurt B, Butler J, Casey DE, Drazner MH, Fonarow GC, Geraci SA, Horwich T, Januzzi JL, Johnson MR, Kasper EK, Levy WC, Masoudi FA, McBride PE, McMurray JJV, Mitchell JE, Peterson PN, Riegel B, Sam F, Stevenson LW, Tang WHW, Tsai EJ, Wilkoff BL. 2013 ACCF/AHA guideline for the management of heart failure: a report of the American College of Cardiology Foundation/American Heart Association Task Force	Discharge Abstract Database from the Canadian Institute of Health Information (April 1 2015 - December 31 2017)	Underuse (98.80%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
			mineralocorticoid receptor antagonists (MRAs) for all patients. ACE inhibitor/ARB: If "NO" to diagnosis of eGFR ≤ml/min per 1.73 m2, AND SBP ≥ 90 mm Hg AND potassium ≤ 5.5 mmol/L, THEN guidelines apply. Beta-blockers: If NYHA class II–IV OR previous myocardial infarction AND SBP ≥ 90 mm Hg AND heart rate ≥ 50/min, THEN guidelines apply. Mineralocorticoid receptor antagonists: If NYHA class III/IV OR previous myocardial infarction AND if "NO" to diagnosis of eGFR ≤30 ml/min per1.73 m2, AND potassium ≤ 5.5 mmol/L, THEN guidelines apply.	on Practice Guidelines. Circulation 2013; 128: e240–e327. Ponikowski P, Voors AA, Anker SD, Bueno H, Cleland JGF, Coats AJS, Falk V, González-Juanatey JR, Harjola V-P, Jankowska EA, Jessup M, Linde C, Nihoyannopoulos P, Parissis JT, Pieske B, Riley JP, Rosano GMC, Ruilope LM, Ruschitzka F, Rutten FH, van der Meer P. 2016 ESC Guidelines for the diagnosis and treatment of acute and chronic heart failure: The Task Force for the diagnosis and treatment of acute and chronic heart failure of the European Society of Cardiology (ESC). Developed with the special contribution of the Heart Failure Association (HFA) of the ESC. Eur Heart J 2016; 37:2129–2200. Ezekowitz JA, O'Meara E, McDonald MA, Abrams H, Chan M, Ducharme A, Giannetti N, Grzeslo A, Hamilton PG, Heckman GA, Howlett JG, Koshman SL, Lepage S, McKelvie RS, Moe GW, Rajda M, Swiggum E, Virani SA, Zieroth S, Al-Hesayen A, Cohen-Solal A, D'Astous M, De S, Estrella-Holder E, Fremes S, Green L, Haddad H, Harkness K, Hernandez AF, Kouz S, LeBlanc MH, Masoudi FA, Ross HJ, Roussin A, Sussex B. 2017 Comprehensive update of the Canadian Cardiovascular Society guidelines for the management of heart failure. Can J Cardiol 2017; 33: 1342–1433. Poelzl G, Altenberger J, Pacher R, Ebner CH, Wieser M, Winter A, Fruhwald F, Dornaus C, Ehmsen U, Reiter S, Steinacher R, Huelsmann M, Eder V, Boehmer A, Pilgersdorfer L, Ablasser K, Keroe D, Groebner H, Auer J, Jakl G, Hallas A, Ess M, Ulmer H. Dose matters! Optimisation of guideline adherence is associated with lower mortality in stable patients with chronic heart failure. Int J Cardiol 2014; 175:83–89.		

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
Donovan, 2016	Diagnostics (Multiple Blood Tests)	Gestation Diabetes Blood Tests (Gestational Diabetes Mellitus)	Guidelines recommend all pregnant women to receive Gestational Diabetes Mellitus (GDM) screening test if she had any of the five types of tests for glycemic assessment (GDS, 75-g OGTT, HbA1c, and fasting or random glucose) within 270 days before delivery date.	Thompson D, Berger H, Feig D, et al.; Canadian Diabetes Association Clinical Practice Guidelines Expert Committee. Diabetes and pregnancy. Can J Diabetes 2013;37(Suppl. 1): S168–S183 Metzger BE, Buchanan TA, Coustan DR, et al. Summary and recommendations of the Fifth International Workshop-Conference on Gestational Diabetes Mellitus. Diabetes Care 2007;30(Suppl. 2): S251–S260 Thompson DCS, Feig D, Kader T, Keely E, Kozak S, Ryan E. Diabetes and Pregnancy, Canadian Diabetes Association 2008, Clinical Practice Guidelines for the Prevention and Managment of Diabetes in Canada. Can J Diabetes 2008;32(Suppl. 1): S168–S80 Landy HJ, Gomez-Marin O, O'Sullivan MJ. Diagnosing gestational diabetes mellitus: use of a glucose screen without administering the glucose tolerance test. Obstet Gynecol 1996; 87:395–400	the Alberta PerinatalHealth Program; Data Integration Measurement and Reportingunit of Alberta Health Services (October 1, 2008 - December 31, 2012)	Underuse (6.40%)
Eddy, 2013	Diagnostics (Imaging)	Computed Tomography-type not specified (Not Specified)	Description of 'Inappropriate': Available evidence suggests that this procedure is considered unreasonable for the described clinical condition.	Canadian Association of Radiologists. Do you need that scan? Ottawa, ON: CAR; 2009. Accessed 2 November 2012. http://bit.ly/SUHvZX Dehn TG, O'Connell B, Hall RN, et al. Appropriateness of imaging examinations: Current state and future approaches. Imaging Economics 2000;(Mar/Apr): 1821.	Not specified (2010-2011)	Overuse (2.00%)
Eddy, 2013	Diagnostics (Imaging)	Magnetic resonance imaging (MRI)-Type not specified (Not Specified)	Description of 'Inappropriate': Available evidence suggests that this procedure is considered unreasonable for the described clinical condition.	Canadian Association of Radiologists. Do you need that scan? Ottawa, ON: CAR; 2009. Accessed 2 November 2012. http://bit.ly/SUHvZX Dehn TG, O'Connell B, Hall RN, et al. Appropriateness of imaging examinations: Current state and future approaches. Imaging Economics 2000;(Mar/Apr): 1821.	Not specified (2010-2011)	Overuse (1.00%)
Elegbede, 2020	Therapeutics (Medications)	Cancer-Drug Unknown (Lung cancer)	Patients with Small Cell Lung Cancer (SCLC) should receive	Alberta Health Services Clinical Practice Guideline. Small cell lung cancer: limited stage. 2012. Available at:	Glans-Look Database; Alberta	Underuse (93.00%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
			appropriate systemic therapy and/or radiotherapy treatment; non–guideline-recommended was classified as "other." Other drug treatments included the following: topotecan, trial agents, cyclophosphamide/adriamycin/vincristine, capecitabine/tomozolamide.	www.albertahealthservices.ca/assets/info/hp/cancer/if-hp-cancer-guide-lu006-lcsc-ltd-stage.pdf. Accessed January 29, 2019. Alberta Health Services Clinical Practice Guideline. Small cell lung cancer: extensive stage. 2012. Available at: www.albertahealthservices.ca/assets/info/hp/cancer/if-hp-cancer-guidelu007-lcsc-extens-stage.pdf. Accessed January 29, 2019. Kalemkerian GP, Loo BW, Akerley W, et al. NCCN Guidelines Insights: Small Cell Lung Cancer, Version 2.2018. J Natl Compr Canc Netw. 2018; 16:1171–1182. Rudin CM, Giaccone G, Ismaila N. Treatment of small-cell lung cancer: American Society of Clinical Oncology Endorsement of the American College of Chest Physicians Guideline. J Oncol Pract. 2016; 12:83–86.	Cancer Registry; Tom Baker Cancer Centre (January 1, 2010 - December 31, 2016)	
Emery, 2013	Diagnostics (Imaging)	Magnetic resonance imaging (MRI)-Type not specified (Lumbar Spine Pain)	Not explicitly stated in study, but authors classified appropriateness of MRI requests based on current guidelines.	Brook RH, Chassin MR, Fink A, Solomon DH, Kosecoff J, Park RE. A method for the detailed assessment of the appropriateness of medical technologies. Int J Technol Assess Health Care. 1986;2(1):53-63. Kennedy J, Quan H, Ghali WA, Feasby TE. Variations in rates of appropriate and inappropriate carotid endarterectomy for stroke prevention in 4 Canadian provinces. CMAJ. 2004;171(5):455-459.	The University of Alberta Hospital; The Ottawa Hospital (May 2008-September 2009; September 2008-March 2010)	Overuse (28.50%)
Eskicioiglu, 2015	Therapeutics (Acute care procedures)	Mechanical Bowel Preparation (Colorectal Surgery)	All patients having any colorectal resection, open or laparoscopic, with the exception of patients having low anterior resections	Guenaga KF, Matos D, Wille-Jorgensen P. Mechanical bowel preparation for elective colorectal surgery. Cochrane Database Syst Rev. 2011. CD001544.	Not specified (June 2008-October 2008)	Underuse (41.40%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
			(LAR) should not receive MBP.			
Falk, 2019	Therapeutics (Medications)	Opioids-medication(s) not specified (Dental Pain)	For patients with chronic noncancer pain who are beginning opioid therapy, we recommend restricting the prescribed dose to less than 90 mg morphine equivalents (MME) daily, rather than having no upper limit or a higher limit on dosing (strong recommendation).	Royal College of Dental Surgeons of Ontario. The Role of Opioids in the Management of Acute and Chronic Pain in Dental Practice. Toronto, ON, Canada: RCDSO; 2015. Available at: http://www.rcdso.org/Assets/DOCUMENTS/Professional_Practice/Guidelines/RCDSO_Guidelines_Role_ of_Opioids.pdf. Accessed July 18, 2018. American Dental Association. Board policy on opioid prescribing. Available at: https://www.ada.org/en/about-the-ada/ada-positions-policies-and-statements/substance-use-disorders. Accessed September 15, 2018.	Drug Programs Information Network database; Manitoba Centre for Health Policy's Population Research Data Repository (April 1, 2014 - March 31, 2017)	Overuse (0.06%)
Ferguson, 2019	Diagnostics (Imaging)	Computed Tomography Pulmonary Angiogram (Not Specified)	Guidelines do not recommend that a CT pulmonary angiogram (CTPA) be performed if there is a low/intermediate Wells' or Geneva score and a D-dimer is not performed, if the Pulmonary Embolism Rule-Out Criteria (PERC) is negative and/or if there is a Low/Intermediate Wells' or Geneva Score and the D-dimer is negative. [From results: D-dimer not performed-Low/Intermediate Wells' or Geneva Score (n=95/510); Pulmonary Embolism Rule-Out Criteria (PERC) negative (n=10/510); D-	Hendriksen MT, Lucassen WA, Erkens PMG, et al. Ruling out pulmonary embolism in primary care: comparison of the diagnostic performance of ''Gestalt'' and the Wells Rule. Ann Fam Med 2016; 14:227e34. Konstantinides SV, Torbicki A, Agnelli G, et al., Task Force for theDiagnosis and Management of Acute Pulmonary Embolism of the European Society of Cardiology (ESC). 2014 ESC guidelines on thediagnosis and management of acute pulmonary e mbolism. Eur Heart J 2014; 35:3033e69. Lucassen W, Geersing G-J, Erkens PMG, et al. Clinical decision rules for excluding pulmonary embolism: a meta-analysis. Ann Intern Med 2011; 155:448e60. Wang RC, Bent S, Weber E, et al. The impact of clinical decision rules on computed tomography use and yield for pulmonary embolism: a systematic review and meta-analysis. Ann Emerg Med 2016; 67:693e701.	Royal Alexandra Hospital; Universityof Alberta Hospital; Northeast Community Health Center (January 2017; April 2017; July 2017; October 2017)	Overuse (27.00%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
			dimer negative-Low/Intermediate Wells' or Geneva Score-D-dimer performed (n=31/510)].			
Findlay, 2010	Diagnostics (Referrals)	Neurosurgery (Non-Specific Lumbar Spine Issues)	Description of 'Inappropriate' lumbar spine referrals: Referral letter includes either of the following: Back pain is described as chief complaint, without mention of leg pain No patient symptoms or complaints are described Plus/Or Imaging is negative for nerve root compression	Chou R, Qaseem A, Snow V, et al. Diagnosis and treatment of low back pain: a joint clinical practice guideline from the American College of Physicians and the American Pain Society. Ann Intern Med. 2007; 147(7): 478-91.	N/A (2007-2009)	Overuse (43.00%)
Gagnon, 2020	Therapeutics (Medications)	Antidepressants-medication(s) not specified (Studies of Potentially Inappropriate Medications)	According to the 2015 Beers criteria, the following medications should be avoided. An individual was considered exposed to a PIM if there was at least one medication claim within the 2014–2015 year for a drug on our adapted PIMs list.	American Geriatrics Society Beers criteria update expert panel, American Geriatrics Society 2015 updated Beers criteria for potentially inappropriate medication use in older adults, J. Am. Geriatr. Soc. 63 (11) (2015) 2227–2246. American Geriatrics Society Beers criteria update expert, American Geriatrics Society updated Beers Criteria for potentially inappropriate medication use in older adults, J. Am. Geriatr. Soc. 60 (4) (2012) 616–631.	Quebec Integrated Chronic Disease Surveillance System of the Institut national de santé publique du Québec (April 1, 2014 - March 31, 2015)	Overuse (10.00%)
Gagnon, 2020	*Therapeutics (Multiple medication results)*	Antiparkinsonian medications-multiple medications-medications not specified (Studies of Potentially Inappropriate Medications)	According to the 2015 Beers criteria, the following medications should be avoided. An individual was considered exposed to a PIM if there was at least one medication claim within the 2014–2015	American Geriatrics Society Beers criteria update expert panel, American Geriatrics Society 2015 updated Beers criteria for potentially inappropriate medication use in older adults, J. Am. Geriatr. Soc. 63 (11) (2015) 2227–2246. American Geriatrics Society Beers criteria update expert, American Geriatrics Society updated Beers Criteria for potentially inappropriate medication use	Quebec Integrated Chronic DiseaseSurveillance System of the Institut national de santé publique du Québec	Overuse (0.30%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
			year for a drug on our adapted PIMs list.	in older adults, J. Am. Geriatr. Soc. 60 (4) (2012) 616–631.	(April 1, 2014 - March 31, 2015)	
Gagnon, 2020	Therapeutics (Medications)	Antipsychotics-medication(s) not specified (Studies of Potentially Inappropriate Medications)	According to the 2015 Beers criteria, the following medications should be avoided. An individual was considered exposed to a PIM if there was at least one medication claim within the 2014–2015 year for a drug on our adapted PIMs list.	American Geriatrics Society Beers criteria update expert panel, American Geriatrics Society 2015 updated Beers criteria for potentially inappropriate medication use in older adults, J. Am. Geriatr. Soc. 63 (11) (2015) 2227–2246. American Geriatrics Society Beers criteria update expert, American Geriatrics Society updated Beers Criteria for potentially inappropriate medication use in older adults, J. Am. Geriatr. Soc. 60 (4) (2012) 616–631.	Quebec Integrated Chronic Disease Surveillance System of the Institut national de santé publique du Québec (April 1, 2014 - March 31, 2015)	Overuse (13.60%)
Gagnon, 2020	Therapeutics (Medications)	Antispasmodics-medication(s) not specified (Studies of Potentially Inappropriate Medications)	According to the 2015 Beers criteria, the following medications should be avoided. An individual was considered exposed to a PIM if there was at least one medication claim within the 2014–2015 year for a drug on our adapted PIMs list.	American Geriatrics Society Beers criteria update expert panel, American Geriatrics Society 2015 updated Beers criteria for potentially inappropriate medication use in older adults, J. Am. Geriatr. Soc. 63 (11) (2015) 2227–2246. American Geriatrics Society Beers criteria update expert, American Geriatrics Society updated Beers Criteria for potentially inappropriate medication use in older adults, J. Am. Geriatr. Soc. 60 (4) (2012) 616–631.	Quebec Integrated Chronic Disease Surveillance System of the Institut national de santé publique du Québec (April 1, 2014 - March 31, 2015)	Overuse (1.00%)
Gagnon, 2020	Therapeutics (Medications)	Antithrombotic-Specific medication not specified (Studies of Potentially Inappropriate Medications)	According to the 2015 Beers criteria, the following medications should be avoided. An individual was considered exposed to a PIM if there was at least one medication claim within the 2014–2015 year for a drug on our adapted PIMs list.	American Geriatrics Society Beers criteria update expert panel, American Geriatrics Society 2015 updated Beers criteria for potentially inappropriate medication use in older adults, J. Am. Geriatr. Soc. 63 (11) (2015) 2227–2246. American Geriatrics Society Beers criteria update expert, American Geriatrics Society updated Beers Criteria for potentially inappropriate medication use in older adults, J. Am. Geriatr. Soc. 60 (4) (2012) 616–631.	Quebec Integrated Chronic DiseaseSurveillance System of the Institut national de santé publique du Québec (April 1, 2014 - March 31, 2015)	Overuse (0.05%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
Gagnon, 2020	Therapeutics (Medications)	Barbiturates (Studies of Potentially Inappropriate Medications)	According to the 2015 Beers criteria, the following medications should be avoided. An individual was considered exposed to a PIM if there was at least one medication claim within the 2014–2015 year for a drug on our adapted PIMs list.	American Geriatrics Society Beers criteria update expert panel, American Geriatrics Society 2015 updated Beers criteria for potentially inappropriate medication use in older adults, J. Am. Geriatr. Soc. 63 (11) (2015) 2227–2246. American Geriatrics Society Beers criteria update expert, American Geriatrics Society updated Beers Criteria for potentially inappropriate medication use in older adults, J. Am. Geriatr. Soc. 60 (4) (2012) 616–631.	Quebec Integrated Chronic Disease Surveillance System of the Institut national de santé publique du Québec (April 1, 2014 - March 31, 2015)	Overuse (0.10%)
Gagnon, 2020	Therapeutics (Medications)	Benzodiazepines-medication(s) not specified (Studies of Potentially Inappropriate Medications)	According to the 2015 Beers criteria, the following medications should be avoided. An individual was considered exposed to a PIM if there was at least one medication claim within the 2014–2015 year for a drug on our adapted PIMs list.	American Geriatrics Society Beers criteria update expert panel, American Geriatrics Society 2015 updated Beers criteria for potentially inappropriate medication use in older adults, J. Am. Geriatr. Soc. 63 (11) (2015) 2227–2246. American Geriatrics Society Beers criteria update expert, American Geriatrics Society updated Beers Criteria for potentially inappropriate medication use in older adults, J. Am. Geriatr. Soc. 60 (4) (2012) 616–631.	Quebec Integrated Chronic Disease Surveillance System of the Institut national de santé publique du Québec (April 1, 2014 - March 31, 2015)	Overuse (50.70%)
Gagnon, 2020	*Therapeutics (Multiple medication results)*	Cardiovascular Medications-multiple medications-medications not specified (Studies of Potentially Inappropriate Medications)	According to the 2015 Beers criteria, the following medications should be avoided. An individual was considered exposed to a PIM if there was at least one medication claim within the 2014–2015 year for a drug on our adapted PIMs list.	American Geriatrics Society Beers criteria update expert panel, American Geriatrics Society 2015 updated Beers criteria for potentially inappropriate medication use in older adults, J. Am. Geriatr. Soc. 63 (11) (2015) 2227–2246. American Geriatrics Society Beers criteria update expert, American Geriatrics Society updated Beers Criteria for potentially inappropriate medication use in older adults, J. Am. Geriatr. Soc. 60 (4) (2012) 616–631.	Quebec Integrated Chronic DiseaseSurveillance System of the Institut national de santé publique du Québec (April 1, 2014 - March 31, 2015)	Overuse (1.60%)
Gagnon, 2020	Therapeutics (Medications)	Central Alpha Blockers-medication(s) not	According to the 2015 Beers criteria, the following medications	American Geriatrics Society Beers criteria update expert panel, American Geriatrics Society 2015 updated Beers criteria for potentially inappropriate	Quebec Integrated Chronic	Overuse (4.30%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
		specified (Studies of Potentially Inappropriate Medications)	should be avoided. An individual was considered exposed to a PIM if there was at least one medication claim within the 2014–2015 year for a drug on our adapted PIMs list.	medication use in older adults, J. Am. Geriatr. Soc. 63 (11) (2015) 2227–2246. American Geriatrics Society Beers criteria update expert, American Geriatrics Society updated Beers Criteria for potentially inappropriate medication use in older adults, J. Am. Geriatr. Soc. 60 (4) (2012) 616–631.	Disease Surveillance System of the Institut national de santé publique du Québec (April 1, 2014 - March 31, 2015)	
Gagnon, 2020	Therapeutics (Medications)	First Generation Antihistamines-multiple medications-medications not specified (Studies of Potentially Inappropriate Medications)	According to the 2015 Beers criteria, the following medications should be avoided. An individual was considered exposed to a PIM if there was at least one medication claim within the 2014–2015 year for a drug on our adapted PIMs list.	American Geriatrics Society Beers criteria update expert panel, American Geriatrics Society 2015 updated Beers criteria for potentially inappropriate medication use in older adults, J. Am. Geriatr. Soc. 63 (11) (2015) 2227–2246. American Geriatrics Society Beers criteria update expert, American Geriatrics Society updated Beers Criteria for potentially inappropriate medication use in older adults, J. Am. Geriatr. Soc. 60 (4) (2012) 616–631.	Quebec Integrated Chronic Disease Surveillance System of the Institut national de santé publique du Québec (April 1, 2014 - March 31, 2015)	Overuse (4.40%)
Gagnon, 2020	*Therapeutics (Multiple medication results)*	Gastrointestinal (other than Proton Pump Inhibitors)-multiple medications-medications not specified (Studies of Potentially Inappropriate Medications)	According to the 2015 Beers criteria, the following medications should be avoided. An individual was considered exposed to a PIM if there was at least one medication claim within the 2014–2015 year for a drug on our adapted PIMs list.	American Geriatrics Society Beers criteria update expert panel, American Geriatrics Society 2015 updated Beers criteria for potentially inappropriate medication use in older adults, J. Am. Geriatr. Soc. 63 (11) (2015) 2227–2246. American Geriatrics Society Beers criteria update expert, American Geriatrics Society updated Beers Criteria for potentially inappropriate medication use in older adults, J. Am. Geriatr. Soc. 60 (4) (2012) 616–631.	Quebec Integrated Chronic DiseaseSurveillance System of the Institut national de santé publique du Québec (April 1, 2014 - March 31, 2015)	Overuse (0.01%)
Gagnon, 2020	*Therapeutics (Multiple medication results)*	Genitourinary medications-multiple medications-medications not specified (Studies	According to the 2015 Beers criteria, the following medications should be avoided. An individual was considered exposed to a	American Geriatrics Society Beers criteria update expert panel, American Geriatrics Society 2015 updated Beers criteria for potentially inappropriate medication use in older adults, J. Am. Geriatr. Soc. 63 (11) (2015) 2227–2246.	Quebec Integrated Chronic Disease Surveillance System of the	Overuse (0.20%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
		of Potentially Inappropriate Medications)	PIM if there was at least one medication claim within the 2014–2015 year for a drug on our adapted PIMs list.	American Geriatrics Society Beers criteria update expert, American Geriatrics Society updated Beers Criteria for potentially inappropriate medication use in older adults, J. Am. Geriatr. Soc. 60 (4) (2012) 616–631.	Institut national de santé publique du Québec (April 1, 2014 - March 31, 2015)	
Gagnon, 2020	Therapeutics (Medications)	Non-benzodiazepine and Benzodiazepine Receptor Agonist Hypnotics (Studies of Potentially Inappropriate Medications)	According to the 2015 Beers criteria, the following medications should be avoided. An individual was considered exposed to a PIM if there was at least one medication claim within the 2014–2015 year for a drug on our adapted PIMs list.	American Geriatrics Society Beers criteria update expert panel, American Geriatrics Society 2015 updated Beers criteria for potentially inappropriate medication use in older adults, J. Am. Geriatr. Soc. 63 (11) (2015) 2227–2246. American Geriatrics Society Beers criteria update expert, American Geriatrics Society updated Beers Criteria for potentially inappropriate medication use in older adults, J. Am. Geriatr. Soc. 60 (4) (2012) 616–631.	Quebec Integrated Chronic Disease Surveillance System of the Institut national de santé publique du Québec (April 1, 2014 - March 31, 2015)	Overuse (0.01%)
Gagnon, 2020	Therapeutics (Medications)	Nonsteroidal Anti-inflammatory Drugs-medication(s) not specified (Studies of Potentially Inappropriate Medications)	According to the 2015 Beers criteria, the following medications should be avoided. An individual was considered exposed to a PIM if there was at least one medication claim within the 2014–2015 year for a drug on our adapted PIMs list.	American Geriatrics Society Beers criteria update expert panel, American Geriatrics Society 2015 updated Beers criteria for potentially inappropriate medication use in older adults, J. Am. Geriatr. Soc. 63 (11) (2015) 2227–2246. American Geriatrics Society Beers criteria update expert, American Geriatrics Society updated Beers Criteria for potentially inappropriate medication use in older adults, J. Am. Geriatr. Soc. 60 (4) (2012) 616–631.	Quebec Integrated Chronic DiseaseSurveillance System of the Institut national de santé publique du Québec (April 1, 2014 - March 31, 2015)	Overuse (2.30%)
Gagnon, 2020	*Therapeutics (Multiple medication results)*	Pain medications-other than NSAIDs and skeletal muscle relaxants-multiple medications-medications not specified (Studies of Potentially	According to the 2015 Beers criteria, the following medications should be avoided. An individual was considered exposed to a PIM if there was at least one medication claim within the 2014–2015	American Geriatrics Society Beers criteria update expert panel, American Geriatrics Society 2015 updated Beers criteria for potentially inappropriate medication use in older adults, J. Am. Geriatr. Soc. 63 (11) (2015) 2227–2246. American Geriatrics Society Beers criteria update expert, American Geriatrics Society updated Beers Criteria for potentially inappropriate medication use	Quebec Integrated Chronic Disease Surveillance System of the Institut national de santé publique	Overuse (0.30%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
		Inappropriate Medications)	year for a drug on our adapted PIMs list.	in older adults, J. Am. Geriatr. Soc. 60 (4) (2012) 616–631.	du Québec (April 1, 2014 - March 31, 2015)	
Gagnon, 2020	Therapeutics (Medications)	Peripheral Alpha-1 Blockers-medication(s) not specified (Studies of Potentially Inappropriate Medications)	According to the 2015 Beers criteria, the following medications should be avoided. An individual was considered exposed to a PIM if there was at least one medication claim within the 2014–2015 year for a drug on our adapted PIMs list.	American Geriatrics Society Beers criteria update expert panel, American Geriatrics Society 2015 updated Beers criteria for potentially inappropriate medication use in older adults, J. Am. Geriatr. Soc. 63 (11) (2015) 2227–2246. American Geriatrics Society Beers criteria update expert, American Geriatrics Society updated Beers Criteria for potentially inappropriate medication use in older adults, J. Am. Geriatr. Soc. 60 (4) (2012) 616–631.	Quebec Integrated Chronic Disease Surveillance System of the Institut national de santé publique du Québec (April 1, 2014 - March 31, 2015)	Overuse (4.70%)
Gagnon, 2020	*Therapeutics (Multiple medication results)*	Potentially Inappropriate Medications-medications not specified (Studies of Potentially Inappropriate Medications)	According to the 2015 Beers criteria, the following medications should be avoided. An individual was considered exposed to a PIM if there was at least one medication claim within the 2014–2015 year for a drug on our adapted PIMs list.	American Geriatrics Society Beers criteria update expert panel, American Geriatrics Society 2015 updated Beers criteria for potentially inappropriate medication use in older adults, J. Am. Geriatr. Soc. 63 (11) (2015) 2227–2246. American Geriatrics Society Beers criteria update expert, American Geriatrics Society updated Beers Criteria for potentially inappropriate medication use in older adults, J. Am. Geriatr. Soc. 60 (4) (2012) 616–631.	Quebec Integrated Chronic DiseaseSurveillance System of the Institut national de santé publique du Québec (April 1, 2014 - March 31, 2015)	Overuse (25.10%)
Gagnon, 2020	Therapeutics (Medications)	Proton Pump Inhibitors-medication(s) not specified (Studies of Potentially Inappropriate Medications)	According to the 2015 Beers criteria, the following medications should be avoided. An individual was considered exposed to a PIM if there was at least one medication claim within the 2014–2015 year for a drug on our adapted PIMs list.	American Geriatrics Society Beers criteria update expert panel, American Geriatrics Society 2015 updated Beers criteria for potentially inappropriate medication use in older adults, J. Am. Geriatr. Soc. 63 (11) (2015) 2227–2246. American Geriatrics Society Beers criteria update expert, American Geriatrics Society updated Beers Criteria for potentially inappropriate medication use in older adults, J. Am. Geriatr. Soc. 60 (4) (2012) 616–631.	Quebec Integrated Chronic Disease Surveillance System of the Institut national de santé publique du Québec (April 1, 2014	Overuse (27.00%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
					- March 31, 2015)	
Gagnon, 2020	Therapeutics (Medications)	Skeletal Muscle Relaxants-medication(s) not specified (Studies of Potentially Inappropriate Medications)	According to the 2015 Beers criteria, the following medications should be avoided. An individual was considered exposed to a PIM if there was at least one medication claim within the 2014–2015 year for a drug on our adapted PIMs list.	American Geriatrics Society Beers criteria update expert panel, American Geriatrics Society 2015 updated Beers criteria for potentially inappropriate medication use in older adults, J. Am. Geriatr. Soc. 63 (11) (2015) 2227–2246. American Geriatrics Society Beers criteria update expert, American Geriatrics Society updated Beers Criteria for potentially inappropriate medication use in older adults, J. Am. Geriatr. Soc. 60 (4) (2012) 616–631.	Quebec Integrated Chronic Disease Surveillance System of the Institut national de santé publique du Québec (April 1, 2014 - March 31, 2015)	Overuse (5.20%)
Gasmi, 2017	Diagnostics (Assessments)	Erythema Migrans (Rash) (Lyme Disease)	Recommended that Erythema Migrans (EM) should be diagnosed between 7 and 14 days after a tick bite. Any diagnosis of EM reported by the GPs in the present study less than 5 days after the tick bite likely represent hypersensitivity reactions to the tick bite and not genuine EM.	Kuschak T. The laboratory diagnosis of lyme borreliosis: guidelines from the Canadian public health laboratory network. Can J Infect Dis Med Microbiol. 2007;18(2):145–8. Wormser GP, Dattwyler RJ, Shapiro ED, Halperin JJ, Steere AC, Klempner MS, et al. The clinical assessment, treatment, and prevention of Lyme disease, human granulocytic anaplasmosis, and babesiosis: clinical practice guidelines by the infectious diseases society of America. Clin Infect Dis. 2006;43(9):1089–134.	Quebec LD passive tick surveillance system (2008 - 2015)	Overuse (63.00%)
Gill, 2017	Diagnostics (Blood tests)	Thyroid Stimulating Hormone (Diabetes mellitus)	Thyroid-stimulating hormone (TSH) is recommended for initial investigation of thyroid disorders. Free thyroxine (FT4) should be measured in the setting of an abnormal TSH, and free triiodothyronine (FT3) only in specific circumstances, such as cases of suspected	American Society for Clinical Pathology Choosing Wisely Recommendations, 2015. Available at: http://www.choosingwisely.org/clinician-lists/american-society-clinical-pathology-suspected-thyroid-disease-evaluation/. Accessed: 3 July 2016. The Canadian Society of Endocrinology and Metabolism Choosing Wisely Canada Recommendations, 2014. Available at: http://www.choosingwiselycanada.org/recommendations/endocrinology-and-metabolism/. Accessed: 3 July 2016	DynaLIFE Medical Labs (January 2014-December 2014)	Overuse (10.10%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
			hyperthyroidism with a normal FT4 and suppressed TSH.	Jonklaas J, Bianco AC, Bauer AJ, Burman KD, Cappola AR, Celi FS, et al. Guidelines for the treatment of hypothyroidism: prepared by the american thyroid association task force on thyroid hormone replacement. Thyroid 2014; 24:1670–751. Garber JR, Cobin RH, Gharib H, Hennessey JV, Klein I, Mechanick JI, et al. Clinical practice guidelines for hypothyroidism in adults: cosponsored by the American Association of Clinical Endocrinologists and the American Thyroid Association. Thyroid 2012; 22:1200–35. Endocrine Society Choosing Wisely Recommendations 2013 [Available from: http://www.choosingwisely.org/societies/endocrine-society/. Accessed: 3 July 2016. Endocrine Society of Australia Choosing Wisely Australia Recommendations, 2016. Available at: http://www.choosingwisely.org.au/getmedia/ffe150c6-0cae-4fa4-a1c5-97d93360c297/CW_Recommendations_ESA_v5.pdf.aspx. Accessed: 3 July 2016.		
Gotto, 2015	Therapeutics (Biophysical Therapy)	Chemotherapy (Neoadjuvant or Adjuvant) (Bladder Cancer)	Guidelines recommend that patients with non-metastatic muscle-invasive bladder cancer (MIBC) should receive local treatment (usually radical cystectomy), ideally combined with neoadjuvant chemotherapy (NACT).	Advanced Bladder Cancer Meta-Analysis Collaboration. Neoadjuvant chemotherapy in invasive bladder cancer: Update of a systematic review and meta-analysis of individual patient data. Eur Urol 2005; 48:202-6. http://dx.doi.org/10.1016/j.eururo.2005.04.006 Alberta Genitourinary Tumour Team. Muscle invasive and locally advanced/metastatic bladder cancer. albertahealthservices.ca/hp/if-hp-cancer-guide-gu002-bladder.pdf. Accessed June 15, 2015. National Comprehensive Cancer Network. Bladder cancer. 2014; version 2. nccn.org/professionals/	Alberta Cancer Registry (January 1, 2007 - December 31, 2011)	Underuse (64.80%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				physician_gls/pdf/bladder.pdf. Accessed June 15, 2015. Witjes JA, Compérat E, Cowan NC, et al. EAU guidelines on muscle-invasive and metastatic bladder cancer: Summary of the 2013 guidelines. Eur Urol 2014; 65:778-92. http://dx.doi.org/10.1016/j.eururo.2013.11.046. Epub 2013 Dec 12. Seah JA, Blais N, North S, et al. Neoadjuvant chemotherapy should be administered to fit patients with newly diagnosed, potentially resectable muscle-invasive urothelial cancer of the bladder (MIBC): A 2013 CAGMO Consensus Statement and Call for a Streamlined Referral Process. Can Urol Assoc J 2013; 7:312-8. http://dx.doi.org/10.5489/cuaj.1506		
Gotto, 2016	Therapeutics (Acute care procedures)	Early Repeat Resection (Bladder Cancer)	Patients with pathologically confirmed high-grade urothelial carcinomas of the bladder that demonstrate lamina propria invasion (high-grade T1 or HGT1-BC) may harbour MIBC that is missed at the time of initial TURBT. This is especially true when no muscle is present in the initial specimen. For this reason, guidelines recommend that patients with HGT1-BC undergo ERR at two to three months following initial TURBT.	Alberta Genitourinary Tumour Team. Nonmuscle invasive bladder cancer. [Updated 2013 November]. www.albertahealthservices.ca/hp/if-hp-cancer-guide-gu009-noninvasive-bladder.pdf. Accessed March 18, 2015. Hall MC, Chang SS, Dalbagni G, et al, Guideline for the management of nonmuscle invasive bladder cancer: Stages Ta, T1 and Tis: Update (2007). [Updated 2014 February. www.auanet.org/common/pdf/education/clinical-guidance/Bladder-Cancer.pdf. Accessed March 18, 2015	Alberta Cancer Registry (January 1, 2007-December 31, 2011)	Underuse (72.20%)
Greenberg, 2016	Diagnostics (Blood tests)	C-Reactive Protein (Acute Pancreatitis)	C-Reactive Protein (CRP) should be performed at admission	Loveday, B.P., et al., High quantity and variable quality of guidelines for acute pancreatitis: a	Not specified (January 1, 2010-	Underuse (99.60%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
			and for the first 72 h after admission. A CRP ≥150 mg/dL at baseline or in the first 72 h is suggestive of severe pancreatitis and is predictive of a worse clinical course.	systematic review. Am J Gastroenterol, 2010. 105(7): p. 1466-76. http://bestpracticeinsurgery.ca/guidelines/all/management-of-acute-pancreatitis/ (Concurrent with the review, a working group of surgeons, gastroenterologists, and intensivists developed a Best Practice in General Surgery guideline on the diagnosis and management of acute pancreatitis based on a review of the available evidence and expert consensus)	December 31, 2011)	
Greenberg, 2016	Therapeutics (Medications)	Antimicrobials--medication(s) not specified (Acute Pancreatitis-General)	Prophylactic antibiotics are not recommended for the treatment of acute pancreatitis.	Loveday, B.P., et al., High quantity and variable quality of guidelines for acute pancreatitis: a systematic review. Am J Gastroenterol, 2010. 105(7): p. 1466-76. http://bestpracticeinsurgery.ca/guidelines/all/management-of-acute-pancreatitis/ (Concurrent with the review, a working group of surgeons, gastroenterologists, and intensivists developed a Best Practice in General Surgery guideline on the diagnosis and management of acute pancreatitis based on a review of the available evidence and expert consensus)	Not specified (January 1, 2010-December 31, 2011)	Overuse (25.50%)
Greenberg, 2016	Therapeutics (Medications)	Antimicrobials--medication(s) not specified (Acute Pancreatitis-infected Necrosis)	When there is radiological or clinical suspicion of infected necrosis in patients with acute necrotic collections (ANCs) or walled-off pancreatic necrosis (WOPN), image-guided fine needle aspirate (FNA) with culture should be performed to distinguish infected from sterile necrosis. Prophylactic antibiotics	Loveday, B.P., et al., High quantity and variable quality of guidelines for acute pancreatitis: a systematic review. Am J Gastroenterol, 2010. 105(7): p. 1466-76. http://bestpracticeinsurgery.ca/guidelines/all/management-of-acute-pancreatitis/ (Concurrent with the review, a working group of surgeons, gastroenterologists, and intensivists developed a Best Practice in General Surgery guideline on the diagnosis and management of acute pancreatitis based on a review of the available evidence and expert consensus)	Not specified (January 1, 2010-December 31, 2011)	Overuse (51.90%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
			should be administered prior to procedure.			
Greenberg, 2016	Diagnostics (Imaging)	Computed Tomography-Abd. (Acute Pancreatitis)	A CT scan should be performed selectively when (1) other abdominal pathology must be ruled out or (2) in patients with suspected local complications of acute pancreatitis (e.g., peritonitis, signs of shock, suggestive ultrasound findings). CT for local complications is most useful at 48–72 h post-onset of symptoms as opposed to at the time of admission. Unless contraindicated (e.g., renal dysfunction), intravenous contrast should be given in order to assess for pancreatic necrosis once patients are adequately fluid resuscitated and normovolemia is restored.	Loveday, B.P., et al., High quantity and variable quality of guidelines for acute pancreatitis: a systematic review. Am J Gastroenterol, 2010. 105(7): p. 1466-76. http://bestpracticeinsurgery.ca/guidelines/all/management-of-acute-pancreatitis/ (Concurrent with the review, a working group of surgeons, gastroenterologists, and intensivists developed a Best Practice in General Surgery guideline on the diagnosis and management of acute pancreatitis based on a review of the available evidence and expert consensus)	Not specified (January 1, 2010-December 31, 2011)	Underuse (43.90%)
Greenberg, 2016	Diagnostics (Imaging)	Computed Tomography, Ultrasound (Acute Pancreatitis)	An ultrasound should be performed in all patients at baseline to evaluate the biliary tract and in particular to determine if the patient has gall stones and/or a stone in the common bile duct. A CT scan should be performed selectively when (1) other	Loveday, B.P., et al., High quantity and variable quality of guidelines for acute pancreatitis: a systematic review. Am J Gastroenterol, 2010. 105(7): p. 1466-76. http://bestpracticeinsurgery.ca/guidelines/all/management-of-acute-pancreatitis/ (Concurrent with the review, a working group of surgeons, gastroenterologists, and intensivists developed a Best Practice in General Surgery guideline on the diagnosis and management of acute	Not specified (January 1, 2010-December 31, 2011)	Underuse (65.30%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
			abdominal pathology must be ruled out or (2) in patients with suspected local complications of acute pancreatitis (e.g., peritonitis, signs of shock, suggestive ultrasound findings). CT for local complications is most useful at 48–72 h post-onset of symptoms as opposed to at the time of admission. Unless contraindicated (e.g., renal dysfunction), intravenous contrast should be given in order to assess for pancreatic necrosis once patients are adequately fluid resuscitated and normovolemia is restored.	pancreatitis based on a review of the available evidence and expert consensus)		
Greenberg, 2016	Therapeutics (Acute care procedures)	Fine Needle Aspiration (Acute Pancreatitis)	When there is radiological or clinical suspicion of infected necrosis in patients with acute necrotic collections (ANCs) or walled-off pancreatic necrosis (WOPN), image-guided fine needle aspirate (FNA) with culture should be performed to distinguish infected from sterile necrosis.	Loveday, B.P., et al., High quantity and variable quality of guidelines for acute pancreatitis: a systematic review. Am J Gastroenterol, 2010. 105(7): p. 1466-76. http://bestpracticeinsurgery.ca/guidelines/all/management-of-acute-pancreatitis/ (Concurrent with the review, a working group of surgeons, gastroenterologists, and intensivists developed a Best Practice in General Surgery guideline on the diagnosis and management of acute pancreatitis based on a review of the available evidence and expert consensus)	Not specified (January 1, 2010-December 31, 2011)	Underuse (97.30%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
Greenberg, 2016	Therapeutics (Biophysical Therapy)	Nutrition-Enteral Nutrition (Acute Pancreatitis)	Enteral nutrition (EN) should be commenced as soon as possible following admission (within 48 h) and is recommended over parenteral nutrition.	Loveday, B.P., et al., High quantity and variable quality of guidelines for acute pancreatitis: a systematic review. Am J Gastroenterol, 2010. 105(7): p. 1466-76. http://bestpracticeinsurgery.ca/guidelines/all/management-of-acute-pancreatitis/ (Concurrent with the review, a working group of surgeons, gastroenterologists, and intensivists developed a Best Practice in General Surgery guideline on the diagnosis and management of acute pancreatitis based on a review of the available evidence and expert consensus)	Not specified (January 1, 2010-December 31, 2011)	Underuse (65.40%)
Greenberg, 2016	Therapeutics (Biophysical Therapy)	Nutrition-Regular Diet (Acute Pancreatitis)	Patients should receive a regular diet on admission with suspected acute pancreatitis. Patients initially unable to tolerate an oral diet due to abdominal pain, nausea, vomiting, or ileus may be allowed to self-advance their diet from NPO to a regular diet as tolerated.	Loveday, B.P., et al., High quantity and variable quality of guidelines for acute pancreatitis: a systematic review. Am J Gastroenterol, 2010. 105(7): p. 1466-76. http://bestpracticeinsurgery.ca/guidelines/all/management-of-acute-pancreatitis/ (Concurrent with the review, a working group of surgeons, gastroenterologists, and intensivists developed a Best Practice in General Surgery guideline on the diagnosis and management of acute pancreatitis based on a review of the available evidence and expert consensus)	Not specified (January 1, 2010-December 31, 2011)	Underuse (100.00%)
Greenberg, 2016	Diagnostics (Imaging)	Ultrasound-Abdominal (Acute Pancreatitis)	An ultrasound should be performed in all patients at baseline to evaluate the biliary tract and in particular to determine if the patient has gall stones and/or a stone in the common bile duct.	Loveday, B.P., et al., High quantity and variable quality of guidelines for acute pancreatitis: a systematic review. Am J Gastroenterol, 2010. 105(7): p. 1466-76. http://bestpracticeinsurgery.ca/guidelines/all/management-of-acute-pancreatitis/ (Concurrent with the review, a working group of surgeons, gastroenterologists, and intensivists developed a Best Practice in General Surgery guideline on the diagnosis and management of acute pancreatitis based on a review of the available evidence and expert consensus)	Not specified (January 1, 2010-December 31, 2011)	Underuse (29.80%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
Greenberg, 2016	Diagnostics (Blood tests)	Serum lipase (Acute pancreatitis)	Serum lipase should be performed in all patients with a suspected diagnosis of acute pancreatitis. A threefold elevation of serum lipase from the upper limit of normal is required to make the diagnosis of acute pancreatitis.	Loveday, B.P., et al., High quantity and variable quality of guidelines for acute pancreatitis: a systematic review. Am J Gastroenterol, 2010. 105(7): p. 1466-76. http://bestpracticeinsurgery.ca/guidelines/all/management-of-acute-pancreatitis/ (Concurrent with the review, a working group of surgeons, gastroenterologists, and intensivists developed a Best Practice in General Surgery guideline on the diagnosis and management of acute pancreatitis based on a review of the available evidence and expert consensus)	Not specified (January 1, 2010-December 31, 2011)	Underuse (77.40%)
Greiver, 2020	Therapeutics (Medications)	ACE Inhibitors OR ARB (Diabetes Mellitus)	Guidelines recommend patients receive cardiovascular risk reduction with vascular protective medications including statins, angiotensin-converting enzyme inhibitors (ACEIs) or angiotensin receptor blockers (ARBs) and antiplatelet agents as an essential component of diabetes management.	Bhattacharyya OK, Estey EA, Cheng AYY. Update on the Canadian Diabetes Association 2008 clinical practice guidelines. Can Fam Physician. 2009;55(1):39.	Ontario Diabetes Database; Canadian Primary Care Sentinel Surveillance Network (January 1, 2010-December 31, 2016)	Underuse (77.10%)
Greiver, 2020	Therapeutics (Medications)	ACE Inhibitors OR ARB (Diabetes Mellitus)	Guidelines recommend patients receive cardiovascular risk reduction with vascular protective medications including statins, angiotensin-converting enzyme inhibitors (ACEIs) or angiotensin receptor blockers (ARBs) and antiplatelet agents as an essential	Bhattacharyya OK, Estey EA, Cheng AYY. Update on the Canadian Diabetes Association 2008 clinical practice guidelines. Can Fam Physician. 2009;55(1):39.	Ontario Diabetes Database; Canadian Primary Care Sentinel Surveillance Network (January 1, 2010-December 31, 2016)	Underuse (62.50%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
			component of diabetes management.			
Greiver, 2020	Therapeutics (Medications)	Antiplatelet Therapy (Diabetes Mellitus)	Guidelines recommend patients receive cardiovascular risk reduction with vascular protective medications including statins, angiotensin-converting enzyme inhibitors (ACEIs) or angiotensin receptor blockers (ARBs) and antiplatelet agents as an essential component of diabetes management.	Bhattacharyya OK, Estey EA, Cheng AYY. Update on the Canadian Diabetes Association 2008 clinical practice guidelines. Can Fam Physician. 2009;55(1):39.	Ontario Diabetes Database; Canadian Primary Care Sentinel Surveillance Network (January 1, 2010-December 31, 2016)	Underuse (93.50%)
Greiver, 2020	Therapeutics (Medications)	Proton Pump Inhibitors-Drug Unknown (Diabetes Mellitus)	Guidelines recommend patients receive cardiovascular risk reduction with vascular protective medications including statins, angiotensin-converting enzyme inhibitors (ACEIs) or angiotensin receptor blockers (ARBs) and antiplatelet agents as an essential component of diabetes management.	Bhattacharyya OK, Estey EA, Cheng AYY. Update on the Canadian Diabetes Association 2008 clinical practice guidelines. Can Fam Physician. 2009;55(1):39.	Ontario Diabetes Database; Canadian Primary Care Sentinel Surveillance Network (January 1, 2010-December 31, 2016)	Underuse (72.30%)
Greiver, 2020	Therapeutics (Medications)	Statins- Drug Unknown (Diabetes Mellitus)	Guidelines recommend patients receive cardiovascular risk reduction with vascular protective medications including statins, angiotensin-converting enzyme inhibitors (ACEIs) or angiotensin receptor blockers (ARBs) and antiplatelet	Bhattacharyya OK, Estey EA, Cheng AYY. Update on the Canadian Diabetes Association 2008 clinical practice guidelines. Can Fam Physician. 2009;55(1):39.	Ontario Diabetes Database; Canadian Primary Care Sentinel Surveillance Network (January 1, 2010-	Underuse (34.90%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
			agents as an essential component of diabetes management.		December 31, 2016)	
Gupta, 2012	Diagnostics (Screening)	Retinopathy of Prematurity (ROP) (Premature Neonates)	Recommended guidelines were to screen neonates with birth weight (BW) less than or equal to 1500 g or gestational age (GA) less than or equal to 30 weeks, or both.	Jeffries AL, Canadian Paediatric Society and Fetus and Newborn Committee. Retinopathy of prematurity: recommendations for screening. Paediatr Child Health. 2010;15:667-70. Canadian Association of Pediatric Ophthalmologists Ad Hoc Committee on Standards of Screening Examination for Retinopathy of Prematurity. Guidelines for screening examinations for retinopathy of prematurity. Can J Ophthal. 2000; 35:251-2. Section on Ophthalmology American Academy of Pediatrics, American Academy of Ophthalmology & American Association for Pediatric Ophthalmology and Strabismus. Screening examination of premature infants for retinopathy of prematurity. Pediatrics. 2006; 117:572-6.	N/A (September 2010)	Underuse (69.60%)
Guttmann, 2011	Diagnostics (Assessments)	18-Month Well Baby Visit (Well Baby Visit)	Recommendations from that 2005 report called for progressing from a well baby check-up to a pivotal, broad-based assessment of developmental health. This included introducing a process that would use standardized tools to facilitate health professionals having a broader discussion with parents on the following key issues: Child development; Parenting; Connecting to local community programs	Expert Panel on the 18 Month Well Baby Visit. Getting It Right at 18 Months ... Making It Right for a Lifetime: Report of the Expert Panel on the 18 Month Well Baby Visit. Toronto: Ministry of Children and Youth Services; 2005.	The Ontario's Registered Persons Database; The Ontario Health Insurance Plan (October 1, 2009-December 31, 2010)	Underuse (61.80%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
			and services that promote healthy child development and early learning; and Promotion of early literacy through book reading.			
Hall (a), 2017	Diagnostics (Imaging)	Carotid Imaging/Doppler (CVD)	All patients with suspected TIA or ischemic stroke should undergo an initial assessment that includes brain imaging and non-invasive vascular imaging of the carotid arteries.	Coutts SB, Wein TH, Lindsay MP, Buck B, Cote R, Ellis P, et al. Canadian Stroke Best Practice Recommendations: secondary prevention of stroke guidelines, update 2014. Int J Stroke. 2015;10(3):282-91; Epub ahead of print Dec 23, 2014. Available at: http://journals.sagepub.com/doi/abs/10.1111/ijs.12439?url_ver=Z39.88-2003&rfr_id=ori:rid:crossref.org&rfr_dat=cr_pub%3dpubmed.	Ontario Stroke Registry (April 1, 2012-March 31, 2013)	Underuse (31.20%)
Hall (a), 2017	Diagnostics (Imaging)	Computed Tomography-Head (CVA)	Patients who present within 48 h of a suspected TIA or ischemic stroke with transient, fluctuating or persistent unilateral weakness (face, arm and/or leg), or speech disturbance are considered at highest risk of recurrent stroke-Urgent brain imaging (CT or magnetic resonance imaging) and non-invasive vascular imaging should be completed without delay.	Coutts SB, Wein TH, Lindsay MP, Buck B, Cote R, Ellis P, et al. Canadian Stroke Best Practice Recommendations: secondary prevention of stroke guidelines, update 2014. Int J Stroke. 2015;10(3):282-91; Epub ahead of print Dec 23, 2014. Available at: http://journals.sagepub.com/doi/abs/10.1111/ijs.12439?url_ver=Z39.88-2003&rfr_id=ori:rid:crossref.org&rfr_dat=cr_pub%3dpubmed.	Ontario Stroke Registry (April 1, 2012-March 31, 2013)	Underuse (12.00%)
Hall (a), 2017	Diagnostics (Referrals)	Secondary Prevention Stroke Clinic (CVD)	Patients who present within 48 h of a suspected TIA or ischemic stroke with transient, fluctuating or	Coutts SB, Wein TH, Lindsay MP, Buck B, Cote R, Ellis P, et al. Canadian Stroke Best Practice Recommendations: secondary	Ontario Stroke Registry (April 1,	Underuse (31.00%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
			persistent symptoms without motor weakness or speech disturbance (e.g. with symptoms such as hemibody sensory loss, or acute monocular visual loss, or binocular diplopia or hemivisual loss or dysmetria) may be considered at high risk of recurrent stroke- These patients should be referred for same-day assessment at the closest stroke prevention clinic or emergency department with capacity for advanced stroke care.	prevention of stroke guidelines, update 2014. Int J Stroke. 2015;10(3):282-91; Epub ahead of print Dec 23, 2014. Available at: http://journals.sagepub.com/doi/abs/10.1111/ijs.12439?url_ver=Z39.88-2003&rfr_id=ori:rid:crossref.org&rfr_dat=cr_pub%3dpubmed.	2012-March 31, 2013)	
Hall (a), 2017	Diagnostics (Assessments)	Swallowing (CVD)	Not provided in study; (from results, recommendation: stroke patients should receive a swallowing assessment).	Coutts SB, Wein TH, Lindsay MP, Buck B, Cote R, Ellis P, et al. Canadian Stroke Best Practice Recommendations: secondary prevention of stroke guidelines, update 2014. Int J Stroke. 2015;10(3):282-91; Epub ahead of print Dec 23, 2014. Available at: http://journals.sagepub.com/doi/abs/10.1111/ijs.12439?url_ver=Z39.88-2003&rfr_id=ori:rid:crossref.org&rfr_dat=cr_pub%3dpubmed.	Ontario Stroke Registry (April 1, 2012-March 31, 2013)	Underuse (50.50%)
Hall (b), 2017	Diagnostics (Imaging)	Carotid Imaging/Doppler (CVD)	Carotid imaging is recommended to determine whether carotid stenosis (narrowing of certain blood vessels in the neck) is present.	Health Quality Ontario; Ministry of Health and Long-Term Care. Quality-based procedures: clinical handbook for stroke (acute and postacute). Toronto: Health Quality Ontario; 2015 December. 148 p. Available from: http://www.hqontario.ca/evidence/evidence-process/episodes-of-care#community-stroke. Quality-Based Procedures: Clinical Handbook for Stroke (Acute) includes best practices for the	Canadian Institute for Health Information (2015-2016)	Underuse (18.20%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				emergency department, acute care and inpatient rehabilitation (Phase 1; April 2013). The updated Quality-Based Procedures: Clinical Handbook for Stroke (Acute and Postacute) also includes best practices for TIA and stroke prevention clinics, early supported discharge, outpatient and community rehabilitation and endovascular treatment (Phase 2; December 2016).		
Hall, 2010	Therapeutics (Acute care procedures)	Carotid Endarterectomy/Stenting (CVD)	Patients with transient ischemic attack or non-disabling stroke and 70–99% internal carotid artery stenosis (narrowing) should be offered carotid endarterectomy within two weeks of the attack orstroke, unless contraindicated.	Lindsay P, Bayley M, Hellings C, Hill M, Woodbury E, Phillips S. Canadian best practice recommendations for stroke care (updated 2008). CMAJ. 2008 Dec 2;179(12): S1-25. [referenced in the Canadian Stroke Strategy as the guidelines followed]	Canadian Institute for Health Information, Discharge Abstract Database (2007-2008)	Underuse (98.10%)
Hall, 2012	Diagnostics (Imaging)	Carotid Imaging/Doppler (CVD)	Carotid imaging is recommended to determine whether carotid stenosis (narrowing of certain blood vessels in the neck) is present.	Lindsay P, Bayley M, Hellings C, Hill M, Woodbury E, Phillips S. Canadian best practice recommendations for stroke care (updated 2008). CMAJ. 2008 Dec 2;179(12): S1-25. [referenced in the Canadian Stroke Strategy as the guidelines followed]	Discharge Abstract Database; the National Ambulatory Care Reporting System Emergency Department subset; the National Rehabilitation Reporting System and the Continuing Care Reporting System; the	Underuse (21.30%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
					Home Care Database; the Registered Persons Database (April 1, 2010-March 31, 2011)	
Hall, 2012	Therapeutics (Medications)	Multiple Medications (Cardiovascular) (CVD)	A variety of medications, including antithrombotic, antihypertensive and lipid lowering agents are recommended to prevent recurrent stroke in those with ischemic stroke or TIA, and should be prescribed at discharge from hospital.	Lindsay P, Bayley M, Hellings C, Hill M, Woodbury E, Phillips S. Canadian best practice recommendations for stroke care (updated 2008). CMAJ. 2008 Dec 2;179(12): S1-25. [referenced in the Canadian Stroke Strategy as the guidelines followed]	Discharge Abstract Database; the National Ambulatory Care Reporting System Emergency Department subset; the National Rehabilitation Reporting System and the Continuing Care Reporting System; the Home Care Database; the Registered Persons Database (April 1, 2010-March 31, 2011)	Underuse (48.60%)
Hall, 2012	Diagnostics (Imaging)	Neuroimaging (CVD)	Guidelines recommend that patients with suspected stroke or TIA receive neuroimaging	Lindsay P, Bayley M, Hellings C, Hill M, Woodbury E, Phillips S. Canadian best practice recommendations for stroke care (updated 2008). CMAJ. 2008 Dec 2;179(12): S1-25. [referenced in	Discharge Abstract Database; the National Ambulatory	Underuse (1.10%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
			prior to discharge from hospital.	the Canadian Stroke Strategy as the guidelines followed]	Care Reporting System Emergency Department subset; the National Rehabilitation Reporting System and the Continuing Care Reporting System; the Home Care Database; the Registered Persons Database (April 1, 2010-March 31, 2011)	
Hall, 2012	Diagnostics (Imaging)	Neuroimaging (CVD)	Guidelines recommend that patients with suspected stroke or TIA receive neuroimaging within 24 hours of presenting to ED.	Lindsay P, Bayley M, Hellings C, Hill M, Woodbury E, Phillips S. Canadian best practice recommendations for stroke care (updated 2008). CMAJ. 2008 Dec 2;179(12): S1-25. [referenced in the Canadian Stroke Strategy as the guidelines followed]	Discharge Abstract Database; the National Ambulatory Care Reporting System Emergency Department subset; the National Rehabilitation Reporting System and the Continuing Care	Underuse (10.40%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
					Reporting System; the Home Care Database; the Registered Persons Database (April 1, 2010-March 31, 2011)	
Hall, 2012	Diagnostics (Referrals)	Secondary Prevention Stroke Clinic (CVD)	It is recommended that all patients not admitted to hospital be referred to a stroke prevention clinic to ensure prompt access to diagnostic testing, risk factor management, and revascularization (if required) to reduce the risk of recurrent stroke and other vascular events.	Lindsay P, Bayley M, Hellings C, Hill M, Woodbury E, Phillips S. Canadian best practice recommendations for stroke care (updated 2008). CMAJ. 2008 Dec 2;179(12): S1-25. [referenced in the Canadian Stroke Strategy as the guidelines followed]	Discharge Abstract Database; the National Ambulatory Care Reporting System Emergency Department subset; the National Rehabilitation Reporting System and the Continuing Care Reporting System; the Home Care Database; the Registered Persons Database (April 1, 2010-March 31, 2011)	Underuse (45.70%)
Hall, 2012	Diagnostics (Assessments)	Swallowing (CVD)	Recommended that initial dysphagia screening is performed	Lindsay P, Bayley M, Hellings C, Hill M, Woodbury E, Phillips S. Canadian best practice recommendations for stroke care (updated 2008).	Discharge Abstract Database; the	Underuse (35.20%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
			within 72 hours of arrival to hospital.	CMAJ. 2008 Dec 2;179(12): S1-25. [referenced in the Canadian Stroke Strategy as the guidelines followed]	National Ambulatory Care Reporting System Emergency Department subset; the National Rehabilitation Reporting System and the Continuing Care Reporting System; the Home Care Database; the Registered Persons Database (April 1, 2010-March 31, 2011)	
Hall, 2012	Therapeutics (Medications)	Tissue Plasminogen Activator (tPA) (CVD)	Eligible patients are those who can receive intravenous alteplase within 4.5 hours of the onset of stroke symptoms in accordance with criteria adapted from the National Institute of Neurological Disorders and Stroke (NINDS) tPA Stroke Study and the Third European Cooperative Acute Stroke Study (ECASS III) [Evidence Level A]	Lindsay P, Bayley M, Hellings C, Hill M, Woodbury E, Phillips S. Canadian best practice recommendations for stroke care (updated 2008). CMAJ. 2008 Dec 2;179(12): S1-25. [referenced in the Canadian Stroke Strategy as the guidelines followed]	Discharge Abstract Database; the National Ambulatory Care Reporting System Emergency Department subset; the National Rehabilitation Reporting System and the	Underuse (67.60%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
			(Cochrane, ECASS III). ii. All eligible patients should receive intravenous alteplase within 1 hour of hospital arrival (door-to-needle time < 60 minutes) [Evidence Level C] (CSQCS, RCP). iii. Administration of alteplase should follow the American Stroke Association guidelines: total dose 0.9 mg/kg with 10% (0.09 mg/kg) given as an intravenous bolus over 1 minute and the remaining 90% (0.81 mg/kg) given as an intravenous infusion over 60 minutes.		Continuing Care Reporting System; the Home Care Database; the Registered Persons Database (April 1, 2010-March 31, 2011)	
Hall, 2015	Diagnostics (Imaging)	Carotid Imaging/Doppler (CVD)	Carotid imaging is recommended to determine whether carotid stenosis (narrowing of certain blood vessels in the neck) is present.	CSS Information and Evaluation Working Group. Performance Measurement Manual: A Supplement to the Canadian Stroke Strategy Canadian Best Practices Recommendations for Stroke Care, Update 2008. Accessed May 7, 2015 at http://www.strokebestpractices.ca/wpcontent/uploads/2012/07/CSS-Performance Health Quality Ontario; Ministry of Health and Long-Term Care. Quality-based procedures: clinical handbook for stroke (acute and postacute). Toronto: Health Quality Ontario; 2015 February. 148 p. Accessed May 19, 2015, at http://www.hqontario.ca/Portals/0/Documents/eds/clinical-handbooks/community Heart and Stroke Foundation. Canadian Stroke Best Practice Recommendations. Accessed May 19, 2015 at http://www.strokebestpractices.ca	Institute for Clinical Evaluative Sciences (2013-2014)	Underuse (20.80%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
Hall, 2015	Therapeutics (Medications)	Tissue Plasminogen Activator (tPA) (CVD)	Eligible patients are those who can receive intravenous alteplase within 4.5 hours of the onset of stroke symptoms in accordance with criteria adapted from the National Institute of Neurological Disorders and Stroke (NINDS) tPA Stroke Study and the Third European Cooperative Acute Stroke Study (ECASS III) [Evidence Level A] (Cochrane, ECASS III). ii. All eligible patients should receive intravenous alteplase within 1 hour of hospital arrival (door-to-needle time < 60 minutes) [Evidence Level C] (CSQCS, RCP). iii. Administration of alteplase should follow the American Stroke Association guidelines: total dose 0.9 mg/kg with 10% (0.09 mg/kg) given as an intravenous bolus over 1 minute and the remaining 90% (0.81 mg/kg) given as an intravenous infusion over 60 minutes.	CSS Information and Evaluation Working Group. Performance Measurement Manual: A Supplement to the Canadian Stroke Strategy Canadian Best Practices Recommendations for Stroke Care, Update 2008. Accessed May 7, 2015 at http://www.strokebestpractices.ca/wpcontent/uploads/2012/07/CSS-Performance Health Quality Ontario; Ministry of Health and Long-Term Care. Quality-based procedures: clinical handbook for stroke (acute and postacute). Toronto: Health Quality Ontario; 2015 February. 148 p. Accessed May 19, 2015, at http://www.hqontario.ca/Portals/0/Documents/eds/clinical-handbooks/community Heart and Stroke Foundation. Canadian Stroke Best Practice Recommendations. Accessed May 19, 2015, at http://www.strokebestpractices.ca	Institute for Clinical Evaluative Sciences (2013-2014)	Underuse (88.10%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
Hall, 2016	Diagnostics (Imaging)	Carotid Imaging/Doppler (CVD)	Carotid imaging is recommended to determine whether carotid stenosis (narrowing of certain blood vessels in the neck) is present.	CSS Information and Evaluation Working Group. Performance Measurement Manual: A Supplement to the Canadian Stroke Strategy Canadian Best Practices Recommendations for Stroke Care, Update 2008. Accessed April 20, 2016 at http://www.strokebestpractices.ca/wp-content/uploads/2012/07/CSSPerformance-Manual-2008_EN.pdf. Health Quality Ontario and Ministry of Health and Long-Term Care. Quality-Based Procedures: Clinical Handbook for Stroke (Acute and Postacute). Toronto, ON: Health Quality Ontario; 2015. Accessed April 20, 2016, at http://www.hqontario.ca/Portals/0/Documents/evidence/clinical-handbooks/community-stroke20151802-en.pdf	The Canadian Institute for Health Information Discharge Abstract Database; National Ambulatory Care Reporting System; Ontario Health Insurance Plan; Registered Persons Database (2014-2015)	Underuse (21.10%)
Harmouch, 2018	Diagnostics (Laboratory tests (non-blood tests))	24-hour Urinary (Kidney Stone Disease)	Guidelines recommend that healthcare providers perform a metabolic evaluation in high-risk stone formers, as well as in interested first-time stone formers. Specifically, a 24-hour urinary metabolic evaluation and kidney stone analysis can assist in preventing recurrence by identifying modifiable risk factors for each individual patient, which allows for a tailored approach, targeted at the patient's lithogenic risk factors.	Dion M, Ankawi G, Chew B, et al. CUA guideline on the evaluation and medical management of the kidney stone patient – 2016 update. Can Urol Assoc J 2016; 10: E347-58. https://doi.org/10.5489/ cuaj.4218 Pearle MS, Goldfarb DS, Assimos DG, et al. Medical management of kidney stones: AUA guideline. J Urol 2014; 192:316-24. https://doi.org/10.1016/j.juro.2014.05.006 Skolarikos A, Straub M, Knoll T, et al. Metabolic evaluation and recurrence prevention for urinary stone patients: EAU guidelines. Eur Urol 2015; 67:750-63. https://doi.org/10.1016/j.eururo.2014.10.029	N/A (January 2017 - November 2017)	Underuse (64.50%)
Harris, 2013	Diagnostics (Laboratory	Albumin-to-Creatinine Ratio	Not provided in study; Archived	Canadian Diabetes Association Clinical Practice Guidelines Expert Committee. Canadian Diabetes	Not specified (2008-2011)	Underuse (59.20%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
	tests (non-blood tests))	(Diabetes Mellitus)	recommendation (2008); (from results recommendation appear to be: patients with Type II Diabetes should have received an ACR test within the study period).	Association 2008 clinical practice guidelines for the prevention and management of diabetes in Canada. Can J Diabetes 2008;32(Suppl 1): S1–201.		
Harris, 2013	Diagnostics (Multiple Blood Tests)	Lipids (Various tests - e.g., total cholesterol, HDL, LDL, triglycerides) (Diabetes Mellitus)	Not provided in study; Archived recommendation (2008); (from results recommendation appear to be: patients with Type II Diabetes should receive at least one cholesterol test).	Canadian Diabetes Association Clinical Practice Guidelines Expert Committee. Canadian Diabetes Association 2008 clinical practice guidelines for the prevention and management of diabetes in Canada. Can J Diabetes 2008;32(Suppl 1): S1–201.	Not specified (2008-2011)	Underuse (27.90%)
Harris, 2013	Diagnostics (Multiple Blood Tests)	Lipids (Various tests - e.g., total cholesterol, HDL, LDL, triglycerides) (Diabetes Mellitus)	Not provided in study; Archived recommendation (2008); (from results recommendation appear to be: patients with Type II Diabetes should receive at least one cholesterol test).	Canadian Diabetes Association Clinical Practice Guidelines Expert Committee. Canadian Diabetes Association 2008 clinical practice guidelines for the prevention and management of diabetes in Canada. Can J Diabetes 2008;32(Suppl 1): S1–201.	Not specified (2008-2011)	Underuse (29.50%)
Harris, 2013	Diagnostics (Multiple Blood Tests)	Lipids (Various tests - e.g., total cholesterol, HDL, LDL, triglycerides) (Diabetes Mellitus)	Not provided in study; Archived recommendation (2008); (from results recommendation appear to be: patients with Type II Diabetes should receive at least one cholesterol test).	Canadian Diabetes Association Clinical Practice Guidelines Expert Committee. Canadian Diabetes Association 2008 clinical practice guidelines for the prevention and management of diabetes in Canada. Can J Diabetes 2008;32(Suppl 1): S1–201.	Not specified (2008-2011)	Underuse (29.00%)
Harris, 2013	Diagnostics (Multiple Blood Tests)	Lipids (Various tests - e.g., total cholesterol, HDL, LDL, triglycerides)	Not provided in study; Archived recommendation (2008); (from results recommendation appear to be: patients with	Canadian Diabetes Association Clinical Practice Guidelines Expert Committee. Canadian Diabetes Association 2008 clinical practice guidelines for the prevention and management of diabetes in Canada. Can J Diabetes 2008;32(Suppl 1): S1–201.	Not specified (2008-2011)	Underuse (30.30%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
		(Diabetes Mellitus)	Type II Diabetes should receive at least one cholesterol test).			
Harris, 2013	Diagnostics (Multiple Blood Tests)	Lipids (Various tests - e.g., total cholesterol, HDL, LDL, triglycerides) (Diabetes Mellitus)	Not provided in study; Archived recommendation (2008); (from results recommendation appear to be: patients with Type II Diabetes should receive at least one cholesterol test).	Canadian Diabetes Association Clinical Practice Guidelines Expert Committee. Canadian Diabetes Association 2008 clinical practice guidelines for the prevention and management of diabetes in Canada. Can J Diabetes 2008;32(Suppl 1): S1–201.	Not specified (2008-2011)	Underuse (30.20%)
Harris, 2013	Diagnostics (Screening)	Depression screen-Screening tool not specified (Diabetes Mellitus)	Not provided in study; Archived recommendation (2008); (from results recommendation appear to be: patients with Type II Diabetes should have a depression screen completed).	Canadian Diabetes Association Clinical Practice Guidelines Expert Committee. Canadian Diabetes Association 2008 clinical practice guidelines for the prevention and management of diabetes in Canada. Can J Diabetes 2008;32(Suppl 1): S1–201.	Not specified (2008-2011)	Underuse (92.70%)
Harris, 2013	Diagnostics (Blood tests)	Glycated Hemoglobin (HbA1c) (Diabetes Mellitus)	Not provided in study; Archived recommendation (2008); (from results, recommendation: patients with Type II Diabetes should receive a quarterly A1c test).	Canadian Diabetes Association Clinical Practice Guidelines Expert Committee. Canadian Diabetes Association 2008 clinical practice guidelines for the prevention and management of diabetes in Canada. Can J Diabetes 2008;32(Suppl 1): S1–201.	Not specified (2008-2011)	Underuse (85.70%)
Harris, 2013	Diagnostics (Assessments)	Blood Pressure (Diabetes Mellitus)	Not provided in study; Archived recommendation (2008); (from results recommendation appear to be: patients with Type II Diabetes should receive a blood pressure test).	Canadian Diabetes Association Clinical Practice Guidelines Expert Committee. Canadian Diabetes Association 2008 clinical practice guidelines for the prevention and management of diabetes in Canada. Can J Diabetes 2008;32(Suppl 1): S1–201.	Not specified (2008-2011)	Underuse (4.90%)
Harris, 2013	Diagnostics (Assessments)	Body Mass Index (Diabetes Mellitus)	Not provided in study; Archived recommendation	Canadian Diabetes Association Clinical Practice Guidelines Expert Committee. Canadian Diabetes Association 2008 clinical practice guidelines for the	Not specified (2008-2011)	Underuse (65.80%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
			(2008); (from results, recommendation: patients with Type II Diabetes should have their BMI measured).	prevention and management of diabetes in Canada. Can J Diabetes 2008;32(Suppl 1): S1–201.		
Harris, 2013	Diagnostics (Assessments)	Electrocardiogram (Diabetes Mellitus)	Not provided in study; Archived recommendation (2008); (from results recommendation appear to be: patients with Type II Diabetes should receive an electrocardiogram test).	Canadian Diabetes Association Clinical Practice Guidelines Expert Committee. Canadian Diabetes Association 2008 clinical practice guidelines for the prevention and management of diabetes in Canada. Can J Diabetes 2008;32(Suppl 1): S1–201.	Not specified (2008-2011)	Underuse (78.80%)
Harris, 2013	Diagnostics (Assessments)	Eye exams (Diabetes Mellitus)	Eye exam recommended every 1-2 years for patients with Type II Diabetes.	Canadian Diabetes Association Clinical Practice Guidelines Expert Committee. Canadian Diabetes Association 2008 clinical practice guidelines for the prevention and management of diabetes in Canada. Can J Diabetes 2008;32(Suppl 1): S1–201.	Not specified (2008-2011)	Underuse (80.50%)
Harris, 2013	Diagnostics (Assessments)	Foot exams (Diabetes Mellitus)	Not provided in study; Archived recommendation (2008); (from results recommendation appear to be: patients with Type II Diabetes should receive a foot exam).	Canadian Diabetes Association Clinical Practice Guidelines Expert Committee. Canadian Diabetes Association 2008 clinical practice guidelines for the prevention and management of diabetes in Canada. Can J Diabetes 2008;32(Suppl 1): S1–201.	Not specified (2008-2011)	Underuse (65.80%)
Harris, 2013	Diagnostics (Blood tests)	Glomerular Filtration Rate (eGFR) (Diabetes Mellitus)	Not provided in study; Archived recommendation (2008); (from results recommendation appear to be: patients with Type II Diabetes should receive a glomerular filtration rate test).	Canadian Diabetes Association Clinical Practice Guidelines Expert Committee. Canadian Diabetes Association 2008 clinical practice guidelines for the prevention and management of diabetes in Canada. Can J Diabetes 2008;32(Suppl 1): S1–201.	Not specified (2008-2011)	Underuse (25.40%)
Harris, 2013	Diagnostics (Assessments)	Neuropathy test (Diabetes Mellitus)	Not provided in study; Archived recommendation (2008); (from results	Canadian Diabetes Association Clinical Practice Guidelines Expert Committee. Canadian Diabetes Association 2008 clinical practice guidelines for the	Not specified (2008-2011)	Underuse (81.90%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
			recommendation appear to be: patients with Type II Diabetes should receive a neuropathy exam).	prevention and management of diabetes in Canada. Can J Diabetes 2008;32(Suppl 1): S1–201.		
Harris, 2013	Diagnostics (Blood tests)	Serum Creatinine (Diabetes Mellitus)	Not provided in study; Archived recommendation (2008); (from results recommendation appear to be: patients with Type II Diabetes should receive a serum creatinine test).	Canadian Diabetes Association Clinical Practice Guidelines Expert Committee. Canadian Diabetes Association 2008 clinical practice guidelines for the prevention and management of diabetes in Canada. Can J Diabetes 2008;32(Suppl 1): S1–201.	Not specified (2008-2011)	Underuse (18.50%)
Harris, 2013	Diagnostics (Assessments)	Waist circumference (Diabetes Mellitus)	Not provided in study; Archived recommendation (2008); (from results recommendation appear to be: patients with Type II Diabetes should have their waist circumference measured).	Canadian Diabetes Association Clinical Practice Guidelines Expert Committee. Canadian Diabetes Association 2008 clinical practice guidelines for the prevention and management of diabetes in Canada. Can J Diabetes 2008;32(Suppl 1): S1–201.	Not specified (2008-2011)	Underuse (91.30%)
Hayward, 2020	Diagnostics (Assessments)	Blood Pressure (Diabetes Mellitus)	Systolic (sBP) and diastolic (dBP) blood pressure (BP) teting for appropriate diabetes monitoring is recommended.	Can J Diabetes. Diabetes Canada Clinical Practice Guidelines Expert Committee. Diabetes Canada 2018 Clinical Practice Guidelines for the Prevention and Management of Diabetes in Canada 2018;42:(Suppl 1): S1–S325.	Diabetes Registry and Surveillance System (2012 - 2014)	Underuse (37.20%)
Hayward, 2020	Diagnostics (Assessments)	Body Mass Index (Diabetes Mellitus)	Completing a body mass index (BMI) assessment for appropriate diabetes monitoring is recommended.	Can J Diabetes. Diabetes Canada Clinical Practice Guidelines Expert Committee. Diabetes Canada 2018 Clinical Practice Guidelines for the Prevention and Management of Diabetes in Canada 2018;42:(Suppl 1): S1–S325.	Diabetes Registry and Surveillance System (2012 - 2014)	Underuse (39.10%)
Hayward, 2020	Diagnostics (Assessments)	Eye exams (Diabetes Mellitus)	Retinopathy screening for appropriate diabetes monitoring is recommended.	Can J Diabetes. Diabetes Canada Clinical Practice Guidelines Expert Committee. Diabetes Canada 2018 Clinical Practice Guidelines for the Prevention and Management of Diabetes in Canada 2018;42:(Suppl 1): S1–S325.	Diabetes Registry and Surveillance System (2012 - 2014)	Underuse (78.40%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
Hayward, 2020	Diagnostics (Blood tests)	Glomerular Filtration Rate (eGFR) (Diabetes Mellitus)	An estimated glomerular filtration rate (eGFR) lab test for nephropathy screen for appropriate diabetes monitoring is recommended.	Can J Diabetes. Diabetes Canada Clinical Practice Guidelines Expert Committee. Diabetes Canada 2018 Clinical Practice Guidelines for the Prevention and Management of Diabetes in Canada 2018;42:(Suppl 1): S1–S325.	Diabetes Registry and Surveillance System (2012 - 2014)	Underuse (88.70%)
Hayward, 2020	Diagnostics (Assessments)	Neuropathy test (Diabetes Mellitus)	An exam with monofilament for neuropathy screen for appropriate diabetes monitoring is recommended.	Can J Diabetes. Diabetes Canada Clinical Practice Guidelines Expert Committee. Diabetes Canada 2018 Clinical Practice Guidelines for the Prevention and Management of Diabetes in Canada 2018;42:(Suppl 1): S1–S325.	Diabetes Registry and Surveillance System (2012 - 2014)	Underuse (89.10%)
Hayward, 2020	Diagnostics (Blood tests)	Glycated Hemoglobin (HbA1c) (Diabetes Mellitus)	Glycated haemoglobin (HbA1c) for appropriate diabetes monitoring is recommended.	Can J Diabetes. Diabetes Canada Clinical Practice Guidelines Expert Committee. Diabetes Canada 2018 Clinical Practice Guidelines for the Prevention and Management of Diabetes in Canada 2018;42:(Suppl 1): S1–S325.	Diabetes Registry and Surveillance System (2012 - 2014)	Underuse (31.00%)
Hayward, 2020	Diagnostics (Multiple Blood Tests)	Lipids (Various tests - e.g., total cholesterol, HDL, LDL, triglycerides) (Diabetes Mellitus)	Low density lipoprotein (LDL) testing for appropriate diabetes monitoring is recommended.	Can J Diabetes. Diabetes Canada Clinical Practice Guidelines Expert Committee. Diabetes Canada 2018 Clinical Practice Guidelines for the Prevention and Management of Diabetes in Canada 2018;42:(Suppl 1): S1–S325.	Diabetes Registry and Surveillance System (2012 - 2014)	Underuse (41.40%)
Health Quality Ontario, 2011	Diagnostics (Assessments)	Electrocardiogram (Diabetes Mellitus)	The elimination of tests that do not improve patient safety, including electrocardiograms (ECGs) and chest X-rays before minor procedures (e.g., cataract surgery).	Canadian Diabetes Association Clinical Practice Guidelines Expert Committee. Canadian Journal of Diabetes. 2008;32(suppl 1):S134–S139. MOHLTC. Ontario's Diabetes Strategy. Nov 2009. www.health.gov.on.ca/en/ms/diabetes/pdf/newsletters/nl_ods_2.pdf; accessed December 8, 2010. Yuan H, et al. Elimination of preoperative testing in ambulatory surgery. Can J Anaesth. 2006; 53:264-266.	Ontario Diabetes Database; Ontario Health Insurance Plan; Registered Persons Database; Institute for Clinical Evaluative Sciences;	Underuse (29.00%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				Schein OD, et al. The value of routine pre-operative medical testing before cataract surgery. NEJM. 2000;342(3):168–175. Ontario Guidelines Advisory Committee. Summary of recommended guideline — hypertension: pharmacologic management. Reference #241. September 2005. www.gacguidelines.ca/site/GAC_Guidelines/assets/pdf/HYPE05-Pharmacologic_Management.pdf; accessed November 1, 2010	Ontario Drug Benefits Database (April 1, 2009-March 31, 2010)	
Health Quality Ontario, 2011	Diagnostics (Assessments)	Eye exams (Diabetes Mellitus)	Indicator: Percentage of people with diabetes who had an eye exam in the past 12 months.	Canadian Diabetes Association Clinical Practice Guidelines Expert Committee. Canadian Journal of Diabetes. 2008;32(suppl 1):S134–S139. MOHLTC. Ontario's Diabetes Strategy. Nov 2009. www.health.gov.on.ca/en/ms/diabetes/pdf/newsletters/nl_ods_2.pdf; accessed December 8, 2010. Yuan H, et al. Elimination of preoperative testing in ambulatory surgery. Can J Anaesth. 2006; 53:264-266. Schein OD, et al. The value of routine pre-operative medical testing before cataract surgery. NEJM. 2000;342(3):168–175. Ontario Guidelines Advisory Committee. Summary of recommended guideline — hypertension: pharmacologic management. Reference #241. September 2005. www.gacguidelines.ca/site/GAC_Guidelines/assets/pdf/HYPE05-Pharmacologic_Management.pdf; accessed November 1, 2010	Ontario Diabetes Database; Ontario Health Insurance Plan; Registered Persons Database; Institute for Clinical Evaluative Sciences; Ontario Drug Benefits Database (April 1, 2009-March 31, 2010)	Underuse (49.00%)
Health Quality Ontario, 2011	Diagnostics (Imaging)	Radiography-Chest (COPD)	The elimination of tests that do not improve patient safety, including chest X-rays before	Canadian Diabetes Association Clinical Practice Guidelines Expert Committee. Canadian Journal of Diabetes. 2008;32(suppl 1):S134–S139.	Ontario Diabetes Database; Ontario Health	Underuse (3.90%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
			minor procedures (e.g., cataract surgery).	MOHLTC. Ontario's Diabetes Strategy. Nov 2009. www.health.gov.on.ca/en/ms/diabetes/pdf/newsletters/nl_ods_2.pdf; accessed December 8, 2010. Yuan H, et al. Elimination of preoperative testing in ambulatory surgery. Can J Anaesth. 2006; 53:264-266. Schein OD, et al. The value of routine pre-operative medical testing before cataract surgery. NEJM. 2000;342(3):168–175. Ontario Guidelines Advisory Committee. Summary of recommended guideline — hypertension: pharmacologic management. Reference #241. September 2005. www.gacguidelines.ca/site/GAC_Guidelines/assets/pdf/HYPE05-Pharmacologic_Management.pdf; accessed November 1, 2010	Insurance Plan; Registered Persons Database; Institute for Clinical Evaluative Sciences; Ontario Drug Benefits Database (April 1, 2009-March 31, 2010)	
Health Quality Ontario, 2011	Therapeutics (Medications)	Thiazides (Diabetes Mellitus)	Uncomplicated high blood pressure is defined as high blood pressure where the patient does not have diabetes, kidney failure, coronary artery disease, stroke, migraine or liver failure, where other drugs for high blood pressure would be more appropriate. Guidelines suggest that in such cases the drug of choice is a thiazide.	Canadian Diabetes Association Clinical Practice Guidelines Expert Committee. Canadian Journal of Diabetes. 2008;32(suppl 1):S134–S139. MOHLTC. Ontario's Diabetes Strategy. Nov 2009. www.health.gov.on.ca/en/ms/diabetes/pdf/newsletters/nl_ods_2.pdf; accessed December 8, 2010. Yuan H, et al. Elimination of preoperative testing in ambulatory surgery. Can J Anaesth. 2006; 53:264-266. Schein OD, et al. The value of routine pre-operative medical testing before cataract surgery. NEJM. 2000;342(3):168–175. Ontario Guidelines Advisory Committee. Summary of recommended guideline — hypertension: pharmacologic management. Reference #241. September 2005. www.gacguidelines.ca/site/GAC_Guidelines/assets/pdf/HYPE05-	Ontario Diabetes Database; Ontario Health Insurance Plan; Registered Persons Database; Institute for Clinical Evaluative Sciences; Ontario Drug Benefits Database (April 1, 2009-March 31, 2010)	Underuse (83.00%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				Pharmacologic_Management.pdf; accessed November 1, 2010		
Henderson, 2020	Diagnostics (Blood tests)	Thyroid Stimulating Hormone (Not Specified)	Guidelines do not recommend triiodothyronine testing for monitoring patients with established hypothyroidism. Not explicitly provided in study; from results, recommendation: Patients received a triiodothyronine blood test not in accordance to clinical indications.	Choosing Wisely. American Society for Clinical Pathology. Don't perform population based screening for 25-OH-vitamin D deficiency. Released February 21, 2013. http://www.choosingwisely.org/ clinician-lists/american-society-clinicalpathologypopulation-based-screening-for-vitamin-ddeficiency/. Accessed April 2, 2019. College of Family Physicians of Canada. Choosing Wisely Canada. Family Medicine. Thirteen things physicians and patients should question. Last updated, July 2019. https:// choosingwiselycanada.org/family-medicine/. Accessed March 21, 2019. Canadian Association of Pathologists. Choosing Wisely Canade. Pathology. Five things physicians and patients should question in pathology. Last updated, June 2017. https://choosingwiselycanada. org/pathology/. Accessed April 2, 2019. Medical Advisory Secretariat. Clinical utility of vitamin D testing: an evidence-based analysis. Ont Health Technol Assess Ser. 2010;10(2):1-93. Provincial Programs Branch. OHIP-insured vitamin D testing. 2010. http://www.health.gov.on.ca/en/pro/programs/ohip/bulletins/4000/bul4522. pdf. Accessed August 19, 2019. Choosing Wisely. Endocrine Society. Don't order a total or free T3 level when assessing levothyroxine (T4) dose in hypothyroid patients. https://www.choosingwisely.org/clinician-lists/ endocrine-society-total-or-free-t3-level-whenassessing-levothryroxine-dose-in-hyperthyroidpatients/. Accessed March 26, 2019.	OHIP databases (January 1, 2010-June 30, 2015; January 1, 2012-June 30, 2015)	Overuse (3.00%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				Canadian Society of Endocrinology and Metabolism. Choosing Wisely Canada. Five things physicians and patients should question. Last updated June 2017. https://choosingwiselycanada. org/endocrinology-and-metabolism/. Accessed April 2, 2019.		
Henderson, 2020	Diagnostics (Blood tests)	Vitamin D (Not Specified)	Guidelines recommend against testing serum vitamin D levels in average-risk individuals. Not explicitly provided in study; from results, recommendation: Patients received a blood test for vitamin D levels not in accordance to clinical indications.	Choosing Wisely. American Society for Clinical Pathology. Don't perform population based screening for 25-OH-vitamin D deficiency. Released February 21, 2013. http://www.choosingwisely.org/ clinician-lists/american-society-clinicalpathologypopulation-based-screening-for-vitamin-ddeficiency/. Accessed April 2, 2019. College of Family Physicians of Canada. Choosing Wisely Canada. Family Medicine. Thirteen things physicians and patients should question. Last updated, July 2019. https:// choosingwiselycanada.org/family-medicine/. Accessed March 21, 2019. Canadian Association of Pathologists. Choosing Wisely Canade. Pathology. Five things physicians and patients should question in pathology. Last updated, June 2017. https://choosingwiselycanada. org/pathology/. Accessed April 2, 2019. Medical Advisory Secretariat. Clinical utility of vitamin D testing: an evidence-based analysis. Ont Health Technol Assess Ser. 2010;10(2):1-93. Provincial Programs Branch. OHIP-insured vitamin D testing. 2010. http://www.health.gov.on.ca/en/pro/programs/ohip/bulletins/4000/bul4522. pdf. Accessed August 19, 2019. Choosing Wisely. Endocrine Society. Don't order a total or free T3 level when assessing levothyroxine (T4) dose in hypothyroid patients. https://www.choosingwisely.org/clinician-lists/ endocrine-society-total-or-free-t3-level-	OHIP databases (January 1, 2010-June 30, 2015; January 1, 2012-June 30, 2015)	Overuse (0.67%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				whenassessing-levothryroxine-dose-in-hyperthyroidpatients/. Accessed March 26, 2019. Canadian Society of Endocrinology and Metabolism. Choosing Wisely Canada. Five things physicians and patients should question. Last updated June 2017. https://choosingwiselycanada. org/endocrinology-and-metabolism/. Accessed April 2, 2019.		
Hinther, 2016	Therapeutics (Biophysical Therapy)	Postoperative Radiotherapy (Oral Cavity Squamous Cell Carcinoma)	The current AHS guidelines recommend PORT for all adverse features associated with high-risk and intermediate-risk of recurrence, with the exception of close margins (1–4 mm). Specifically, AHS guidelines recommend PORT for cases with nodal ECS, involved margins, pT3 or pT4, pN2 or pN3 nodal disease, nodal disease in levels IV or V, PNI, and LVI. For cases with ECS and/or positive margins, AHS recommends PORT in combination with chemotherapy or a re-resection of the tumor.	Alberta Health Services (AHS). Oral Cavity Cancer Clinical Practice Guidelines. Alberta, Canada: Alberta Health Services; 2014. Brown JS, Shaw RJ, Bekiroglu F, Rogers SN. Systematic review of the current evidence in the use of postoperative radiotherapy for oral squamous cell carcinoma. Br J Oral Maxillofac Surg 2012; 50:481–489. Harris JR, Lau H, Surgeoner BV, et al. Health care delivery for head-and neck cancer patients in Alberta: a practice guideline. Curr Oncol 2014;21: e704–e714.	N/A (January 1, 2009-December 31, 2013)	Overuse (1.00%)
Hinther, 2016	Therapeutics (Biophysical Therapy)	Radiation Therapy (Oral Cancer)	The current AHS guidelines recommend PORT for all adverse features associated with high-risk and intermediate-risk of recurrence, with the exception of close	Alberta Health Services (AHS). Oral Cavity Cancer Clinical Practice Guidelines. Alberta, Canada: Alberta Health Services; 2014. Brown JS, Shaw RJ, Bekiroglu F, Rogers SN. Systematic review of the current evidence in the use of postoperative radiotherapy for oral squamous cell	N/A (January 1, 2009-December 31, 2013)	Underuse (15.90%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
			margins (1–4 mm). Specifically, AHS guidelines recommend PORT for cases with nodal ECS, involved margins, pT3 or pT4, pN2 or pN3 nodal disease, nodal disease in levels IV or V, PNI, and LVI. For cases with ECS and/or positive margins, AHS recommends PORT in combination with chemotherapy or a re-resection of the tumor.	carcinoma. Br J Oral Maxillofac Surg 2012; 50:481–489. Harris JR, Lau H, Surgeoner BV, et al. Health care delivery for head-and neck cancer patients in Alberta: a practice guideline. Curr Oncol 2014;21: e704–e714.		
Ho, 2017	Therapeutics (Biophysical Therapy)	Implantable Cardioverter Defibrillator Therapy (After Out-of-Hospital Cardiac Arrest)	Guidelines recommend that patients are likely able to benefit from secondary ICD therapy with all 3 of a shockable initial rhythm, no definite ischemia, and a good neurologic status.	Tang AS, Ross H, Simpson CS, et al. Canadian Cardiovascular Society/Canadian Heart Rhythm Society position paper on implantable cardioverter defibrillator use in Canada. Can J Cardiol 2005;21(suppl A):11A-8A. Bennett M, Parkash R, Nery P, et al. Canadian Cardiovascular Society/Canadian Heart Rhythm Society 2016 implantable cardioverterdefibrillator guidelines. Can J Cardiol 2017; 33:174-88. Epstein A, DiMarco J, Ellenbogen K, et al. ACC/AHA/HRS 2008 guidelines for device-based therapy of cardiac rhythm abnormalities: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines (Writing Committee to Revise the ACC/AHA/NASPE 2002 Guideline). Circulation 2008;117: e350-408. Zipes DP, Camm AJ, Borggrefe M, et al. ACC/AHA/ESC 2006 guidelines for management of patients with ventricular arrhythmias and the prevention of sudden cardiac death: a report of the American College of Cardiology/American Heart	Rescu Epistry cardiac arrest database (2011-2014)	Overuse (16.70%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				Association Task Force and the European Society of Cardiology Committee for Practice Guidelines (Writing Committee to Develop guidelines for management of patients with ventricular arrhythmias and the prevention of sudden cardiac death) developed in collaboration with the European Heart Rhythm Association and the Heart Rhythm Society. Europace 2006; 8:746-837.		
Hsu, 2020	*Multiple Tests*	Diabetes Care (Recommended-Four HbA1C tests, one eye test, and one cholesterol test in a 2-year period) (Diabetes Mellitus)	Optimal care is defined as having four HbA1c tests, one eye test, and onecholesterol test in a 2-year period.	American Diabetes Association: Standards of medical care in diabetes—2015. Diabetes Care 2015; 38(suppl 1): S1–S4 Canadian Diabetes Association Clinical Practice Guidelines Expert Committee, Cheng AY: Canadian Diabetes Association 2013 clinical practice guidelines for the prevention and management of diabetes in Canada. Introduction. Can J Diabetes 2013; 37(suppl 1): S1–S3	Ontario Diabetes Database; Registered Persons Database; National Ambulatory Care Reporting System (April 1, 2011 - April 1, 2013)	Underuse (60.50%)
Iaboni, 2019	Therapeutics (Medications)	Opioids-medication(s) not specified (Studies of Potentially Inappropriate Medications)	Avoiding escalation of daily dosages greater than 90 mg of morphine equivalents (MME) and avoiding co-prescribing opioids with benzodiazepines is recommended.	Assessment and management of pain. 3rd ed. Toronto: Registered Nurses' Association of Ontario; 2013. Hadjistavropoulos T, Fitzgerald TD, Marchildon GP. Practice guidelines for assessing pain in older persons with dementia residing in long-term care facilities. Physiother Can 2010; 62:104-13. Kahan M, Wilson L, Mailis-Gagnon A, et al. Canadian guideline for safe and effective use of opioids for chronic noncancer pain: clinical summary for family physicians. Part 2: special populations. Can Fam Physician 2011; 57:1269-76. Dowell D, Haegerich TM, Chou R. CDC guideline for prescribing opioids for chronic pain [published erratum in: MMWR Recomm Rep 2016;65:295]. MMWR Recomm Rep 2016; 65:1-49.	Canadian Institute for Health Information Continuing Care Reporting System; the Ontario Drug Benefit Program database; Registered Persons Database (April 1, 2009 - March 31, 2017)	Overuse (3.60%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
Iaboni, 2019	Therapeutics (Medications)	Opioids-medication(s) not specified (Studies of Potentially Inappropriate Medications)	Avoiding escalation of daily dosages greater than 90 mg of morphineequivalents (MME) and avoiding co-prescribing opioids withbenzodiazepines is recommended.	Assessment and management of pain. 3rd ed. Toronto: Registered Nurses' Association of Ontario; 2013. Hadjistavropoulos T, Fitzgerald TD, Marchildon GP. Practice guidelines for assessing pain in older persons with dementia residing in long-term care facilities. Physiother Can 2010; 62:104-13. Kahan M, Wilson L, Mailis-Gagnon A, et al. Canadian guideline for safe and effective use of opioids for chronic noncancer pain: clinical summary for family physicians. Part 2: special populations. Can Fam Physician 2011; 57:1269-76. Dowell D, Haegerich TM, Chou R. CDC guideline for prescribing opioids for chronic pain [published erratum in: MMWR Recomm Rep 2016;65:295]. MMWR Recomm Rep 2016; 65:1-49.	Canadian Institute for Health Information Continuing Care Reporting System; the Ontario Drug Benefit Program database; Registered Persons Database (April 1, 2009 - March 31, 2017)	Overuse (3.40%)
Irfan, 2015	Therapeutics (Medications)	Antimicrobials--medication(s) not specified (Asymptomatic Bacteriuria)	Guidelines do not recommend that antibiotics are prescribed for Asymptomatic Bacteriuria (ASB).	Nicolle LE, Bradley S, Colgan R, Rice JC, Schaeffer A, Hooton TM. Infectious Diseases Society of America guidelines for the diagnosis and treatment of asymptomatic bacteriuria in adults. Clin Infect Dis. 2005; 40(5):643–54. Epub 2005/02/17. doi: 10.1086/427507 PMID: 15714408.	Not specified (January 30, 2012-April 17, 2012)	Overuse (58.80%)
Kahn, 2012	Therapeutics (Medications)	Venous Thromboembolism Prophylaxis (Cancer)	Patients should have received any form of thromboprophylaxis for Venous Thromboembolism (VTE) associated with a recent (within the last 3 months) medical admission, major surgery and/or leg immobilisation (including paralysis,	Kearon, C., Kahn, S. R., Agnelli, G., Goldhaber, S., Raskob, G. E., & Comerota, A. J. (2008). Antithrombotic therapy for venous thromboembolic disease: American College of Chest Physicians evidence-based clinical practice guidelines. Chest, 133(6), 454S-545S.	Not specified (2007-2010)	Underuse (61.20%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
			fracture, cast or immobility).			
Kahn, 2012	Therapeutics (Medications)	Venous Thromboembolism Prophylaxis (Cancer)	Receive LMWH monotherapy to treat cancer-association Venous Thromboembolism (VTE).	Kearon, C., Kahn, S. R., Agnelli, G., Goldhaber, S., Raskob, G. E., & Comerota, A. J. (2008). Antithrombotic therapy for venous thromboembolic disease: American College of Chest Physicians evidence-based clinical practice guidelines. Chest, 133(6), 454S-545S.	Not specified (2007-2010)	Underuse (40.50%)
Kahn, 2012	Therapeutics (Medications)	Venous Thromboembolism Prophylaxis (Cancer)	Patients with VTE should have received at least one day overlap of LMWH and VKA once the International Normalised ratio (INR) was therapeutic in patients treated with initial LMWH overlapped with VKA.	Kearon, C., Kahn, S. R., Agnelli, G., Goldhaber, S., Raskob, G. E., & Comerota, A. J. (2008). Antithrombotic therapy for venous thromboembolic disease: American College of Chest Physicians evidence-based clinical practice guidelines. Chest, 133(6), 454S-545S.	Not specified (2007-2010)	Underuse (14.50%)
Kahn, 2012	Therapeutics (Medications)	Venous Thromboembolism Prophylaxis (Cancer)	Patients with VTE should have received at least 5 days of Low-Molecular-Weight-Heparin (LMWH) in patients treated with LMWH overlapped with VKA (Vitamin K Agonists).	Kearon, C., Kahn, S. R., Agnelli, G., Goldhaber, S., Raskob, G. E., & Comerota, A. J. (2008). Antithrombotic therapy for venous thromboembolic disease: American College of Chest Physicians evidence-based clinical practice guidelines. Chest, 133(6), 454S-545S.	Not specified (2007-2010)	Underuse (7.30%)
Kandalam, 2020	Diagnostics (Blood tests)	Complete Blood Count (Not Specified)	Guidelines recommend against repeating laboratory investigation on inpatients who are clinical stable; specifically, for not repeating Complete Blood Count (CBC) testing unless diagnostic suspicion was present in clinical scenarios involving stable patients who were awaiting	Choosing Wisely Canada, Recommendations and Resources, By Specialty, 2019. [Online]. Available: https://choosingwiselycanada.org/wp-content/uploads/2017/02/Choosing-Wisely-Canada-collection-of-lists.pdf (accessed: 04-Nov-2019). Canadian Society of Internal Medicine, Choosing Wisely Canada – Internal Medicine: Eleven Things Physicians and Patients Should Question, Choosing Wisely Canada, 2018. [Online], Available: https://choosingwiselycanada.org/internalmedicine/ (accessed: 01-Aug-2019).	Millennium, Sunquest, Meditech Laboratory Information System, which comprised the provincial Consolidated Laboratory Data Repository (January 1,	Overuse (5.40%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
			rehabilitation/transition/ placement.	Resident Doctors of Canada, Five Things Medical Residents and Patients Should Question, Choosing Wisely Canada, 2017. [Online], Available: https://choosingwiselycanada.org/residents/ (accessed: 04-Nov-2019). A. Ambasta, S. Pancic, B.M. Wong, T. Lee, D. McCaughey, I.W.Y. Ma, Expert recommendations on frequency of utilization of common laboratory tests in medical inpatients: a Canadian consensus study, J. Gen. Int. Med. (2019).	2018 - December 31, 2018)	
Kandalam, 2020	Diagnostics (Blood tests)	Electrolyte Panel (Not Specified)	Guidelines recommend against repeating laboratory investigation on inpatients who are clinical stable; specifically, for not repeating Electrolyte Panel (EP) testing unless diagnostic suspicion was present in clinical scenarios involving stable patients who were awaiting rehabilitation/transition/ placement.	Choosing Wisely Canada, Recommendations and Resources, By Specialty, 2019. [Online]. Available: https://choosingwiselycanada.org/wp-content/uploads/2017/02/Choosing-Wisely-Canada-collection-of-lists.pdf (accessed: 04-Nov-2019). Canadian Society of Internal Medicine, Choosing Wisely Canada – Internal Medicine: Eleven Things Physicians and Patients Should Question, Choosing Wisely Canada, 2018. [Online], Available: https://choosingwiselycanada.org/internalmedicine/ (accessed: 01-Aug-2019). Resident Doctors of Canada, Five Things Medical Residents and Patients Should Question, Choosing Wisely Canada, 2017. [Online], Available: https://choosingwiselycanada.org/residents/ (accessed: 04-Nov-2019). A. Ambasta, S. Pancic, B.M. Wong, T. Lee, D. McCaughey, I.W.Y. Ma, Expert recommendations on frequency of utilization of common laboratory tests in medical inpatients: a Canadian consensus study, J. Gen. Int. Med. (2019).	Millennium, Sunquest, Meditech Laboratory Information System, which comprised the provincial Consolidated Laboratory Data Repository (January 1, 2018 - December 31, 2018)	Overuse (35.60%)
Kapral, 2011	Diagnostics (Imaging)	Carotid Imaging, Angiography (CVD)	In many patients with ischemic stroke or TIA, carotid imaging is recommended to	Heart and Stroke Foundation of Canada. The Growing Burden of Heart Disease and Stroke in Canada 2003. Ottawa: HSFC; 2003. Accessed on	Ontario Stroke System (April 1,	Underuse (32.50%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
			determine whether carotid stenosis (narrowing of certain blood vessels in the neck) is present.	November 23, 2010, at http://www.cvdinfobase.ca/cvdbook/CVD_En03.pdf. Stroke Unit Trialists' Collaboration. Organised inpatient (stroke unit) care for stroke. Cochrane Database Syst Rev 2007; (4):CD000197. Chen ZM, Sandercock P, Pan HC, Counsell C, Collins R, Liu LS, et al. Indications for early aspirin use in acute ischemic stroke: A combined analysis of 40,000 randomized patients from the Chinese Acute Stroke Trial and the International Stroke Trial. Stroke 2000; 31(6):1240–9. The National Institute of Neurological Disorders and Stroke rt-PA Stroke Study Group. Tissue plasminogen activator for acute ischemic stroke. N Eng J Med 1995; 333(24):1581–7. Antithrombotic Trialists' Collaboration. Collaborative meta-analysis of randomised trials of antiplatelet therapy for prevention of death, myocardial infarction, and stroke in high risk patients. BMJ 2002; 324(7329):71–86. Saxena R, Koudstaal PJ. Anticoagulants for preventing stroke in patients with nonrheumatic atrial fibrillation and a history of stroke or transient ischemic attack. Cochrane Database Syst Rev 2002; (4):CD000185. Rothwell PM, Eliasziw M, Gutnikov SA, Fox AJ, Taylor DW, Mayberg MR, et al. Analysis of pooled data from the randomized controlled trials of endarterectomy for symptomatic carotid stenosis. Lancet 2003; 361(9352):107–16. Joint Stroke Strategy Working Group. Towards an Integrated Stroke Strategy for Ontario. Report of the Joint Stroke Strategy Working Group. [Toronto]: Ontario Ministry of Health and Long-Term Care and	2008-March 31, 2009)	

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				the Heart and Stroke Foundation of Ontario; 2000. Accessed on November 23, 2010, at http://www.health.gov.on.ca/english/public/pub/ministry_reports/stroke/strokereport.pdf.		
Kapral, 2011	Therapeutics (Medications)	Multiple Medications (Cardiovascular) (CVD)	In many patients with ischemic stroke or TIA, carotid imaging is recommended to determine whether carotid stenosis (narrowing of certain blood vessels in the neck) is present.	Heart and Stroke Foundation of Canada. The Growing Burden of Heart Disease and Stroke in Canada 2003. Ottawa: HSFC; 2003. Accessed on November 23, 2010, at http://www.cvdinfobase.ca/cvdbook/CVD_En03.pdf. Stroke Unit Trialists' Collaboration. Organised inpatient (stroke unit) care for stroke. Cochrane Database Syst Rev 2007; (4):CD000197. Chen ZM, Sandercock P, Pan HC, Counsell C, Collins R, Liu LS, et al. Indications for early aspirin use in acute ischemic stroke: A combined analysis of 40,000 randomized patients from the Chinese Acute Stroke Trial and the International Stroke Trial. Stroke 2000; 31(6):1240–9. The National Institute of Neurological Disorders and Stroke rt-PA Stroke Study Group. Tissue plasminogen activator for acute ischemic stroke. N Eng J Med 1995; 333(24):1581–7. Antithrombotic Trialists' Collaboration. Collaborative meta-analysis of randomised trials of antiplatelet therapy for prevention of death, myocardial infarction, and stroke in high risk patients. BMJ 2002; 324(7329):71–86. Saxena R, Koudstaal PJ. Anticoagulants for preventing stroke in patients with nonrheumatic atrial fibrillation and a history of stroke or transient ischemic attack. Cochrane Database Syst Rev 2002; (4):CD000185. Rothwell PM, Eliasziw M, Gutnikov SA, Fox AJ, Taylor DW, Mayberg MR, et al. Analysis of pooled	Ontario Stroke System (April 1, 2008-March 31, 2009)	Underuse (32.50%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				data from the randomized controlled trials of endarterectomy for symptomatic carotid stenosis. Lancet 2003; 361(9352):107–16. Joint Stroke Strategy Working Group. Towards an Integrated Stroke Strategy for Ontario. Report of the Joint Stroke Strategy Working Group. [Toronto]: Ontario Ministry of Health and Long-Term Care and the Heart and Stroke Foundation of Ontario; 2000. Accessed on November 23, 2010, at http://www.health.gov.on.ca/english/public/pub/ministry_reports/stroke/strokereport.pdf.		
Kapral, 2011	Therapeutics (Medications)	Multiple Medications (Cardiovascular) (CVD)	A variety of medications, including antithrombotic, antihypertensive and lipid lowering agents are recommended to prevent recurrent stroke in those with ischemic stroke or TIA, and should be prescribed at discharge from hospital.	Heart and Stroke Foundation of Canada. The Growing Burden of Heart Disease and Stroke in Canada 2003. Ottawa: HSFC; 2003. Accessed on November 23, 2010, at http://www.cvdinfobase.ca/cvdbook/CVD_En03.pdf. Stroke Unit Trialists' Collaboration. Organised inpatient (stroke unit) care for stroke. Cochrane Database Syst Rev 2007; (4):CD000197. Chen ZM, Sandercock P, Pan HC, Counsell C, Collins R, Liu LS, et al. Indications for early aspirin use in acute ischemic stroke: A combined analysis of 40,000 randomized patients from the Chinese Acute Stroke Trial and the International Stroke Trial. Stroke 2000; 31(6):1240–9. The National Institute of Neurological Disorders and Stroke rt-PA Stroke Study Group. Tissue plasminogen activator for acute ischemic stroke. N Eng J Med 1995; 333(24):1581–7. Antithrombotic Trialists' Collaboration. Collaborative meta-analysis of randomised trials of antiplatelet therapy for prevention of death, myocardial infarction, and stroke in high risk patients. BMJ 2002; 324(7329):71–86.	Ontario Stroke System (April 1, 2008-March 31, 2009)	Underuse (6.30%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				Saxena R, Koudstaal PJ. Anticoagulants for preventing stroke in patients with nonrheumatic atrial fibrillation and a history of stroke or transient ischemic attack. Cochrane Database Syst Rev 2002; (4):CD000185. Rothwell PM, Eliasziw M, Gutnikov SA, Fox AJ, Taylor DW, Mayberg MR, et al. Analysis of pooled data from the randomized controlled trials of endarterectomy for symptomatic carotid stenosis. Lancet 2003; 361(9352):107–16. Joint Stroke Strategy Working Group. Towards an Integrated Stroke Strategy for Ontario. Report of the Joint Stroke Strategy Working Group. [Toronto]: Ontario Ministry of Health and Long-Term Care and the Heart and Stroke Foundation of Ontario; 2000. Accessed on November 23, 2010, at http://www.health.gov.on.ca/english/public/pub/ministry_reports/stroke/strokereport.pdf.		
Kapral, 2011	Diagnostics (Imaging)	Neuroimaging (CVD)	Neuroimaging using computed tomography (CT) or magnetic resonance imaging (MRI) is the standard of care for all patients with suspected stroke or TIA, both to confirm the diagnosis and to provide information on stroke type.	Heart and Stroke Foundation of Canada. The Growing Burden of Heart Disease and Stroke in Canada 2003. Ottawa: HSFC; 2003. Accessed on November 23, 2010, at http://www.cvdinfobase.ca/cvdbook/CVD_En03.pdf. Stroke Unit Trialists' Collaboration. Organised inpatient (stroke unit) care for stroke. Cochrane Database Syst Rev 2007; (4):CD000197. Chen ZM, Sandercock P, Pan HC, Counsell C, Collins R, Liu LS, et al. Indications for early aspirin use in acute ischemic stroke: A combined analysis of 40,000 randomized patients from the Chinese Acute Stroke Trial and the International Stroke Trial. Stroke 2000; 31(6):1240–9. The National Institute of Neurological Disorders and Stroke rt-PA Stroke Study Group. Tissue	Ontario Stroke System (April 1, 2008-March 31, 2009)	Underuse (7.20%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				plasminogen activator for acute ischemic stroke. N Eng J Med 1995; 333(24):1581–7. Antithrombotic Trialists' Collaboration. Collaborative meta-analysis of randomised trials of antiplatelet therapy for prevention of death, myocardial infarction, and stroke in high risk patients. BMJ 2002; 324(7329):71–86. Saxena R, Koudstaal PJ. Anticoagulants for preventing stroke in patients with nonrheumatic atrial fibrillation and a history of stroke or transient ischemic attack. Cochrane Database Syst Rev 2002; (4):CD000185. Rothwell PM, Eliasziw M, Gutnikov SA, Fox AJ, Taylor DW, Mayberg MR, et al. Analysis of pooled data from the randomized controlled trials of endarterectomy for symptomatic carotid stenosis. Lancet 2003; 361(9352):107–16. Joint Stroke Strategy Working Group. Towards an Integrated Stroke Strategy for Ontario. Report of the Joint Stroke Strategy Working Group. [Toronto]: Ontario Ministry of Health and Long-Term Care and the Heart and Stroke Foundation of Ontario; 2000. Accessed on November 23, 2010, at http://www.health.gov.on.ca/english/public/pub/ministry_reports/stroke/strokereport.pdf.		
Kapral, 2011	Diagnostics (Referrals)	Secondary Prevention Stroke Clinic (CVD)	It is recommended that all patients not admitted to hospital be referred to a stroke prevention clinic to ensure prompt access to diagnostic testing, risk factor management, and revascularization (if required) to reduce the risk of recurrent stroke	Heart and Stroke Foundation of Canada. The Growing Burden of Heart Disease and Stroke in Canada 2003. Ottawa: HSFC; 2003. Accessed on November 23, 2010, at http://www.cvdinfobase.ca/cvdbook/CVD_En03.pdf. Stroke Unit Trialists' Collaboration. Organised inpatient (stroke unit) care for stroke. Cochrane Database Syst Rev 2007; (4):CD000197.	Ontario Stroke System (April 1, 2008-March 31, 2009)	Underuse (42.80%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
			and other vascular events.	Chen ZM, Sandercock P, Pan HC, Counsell C, Collins R, Liu LS, et al. Indications for early aspirin use in acute ischemic stroke: A combined analysis of 40,000 randomized patients from the Chinese Acute Stroke Trial and the International Stroke Trial. Stroke 2000; 31(6):1240–9. The National Institute of Neurological Disorders and Stroke rt-PA Stroke Study Group. Tissue plasminogen activator for acute ischemic stroke. N Eng J Med 1995; 333(24):1581–7. Antithrombotic Trialists' Collaboration. Collaborative meta-analysis of randomised trials of antiplatelet therapy for prevention of death, myocardial infarction, and stroke in high risk patients. BMJ 2002; 324(7329):71–86. Saxena R, Koudstaal PJ. Anticoagulants for preventing stroke in patients with nonrheumatic atrial fibrillation and a history of stroke or transient ischemic attack. Cochrane Database Syst Rev 2002; (4):CD000185. Rothwell PM, Eliasziw M, Gutnikov SA, Fox AJ, Taylor DW, Mayberg MR, et al. Analysis of pooled data from the randomized controlled trials of endarterectomy for symptomatic carotid stenosis. Lancet 2003; 361(9352):107–16. Joint Stroke Strategy Working Group. Towards an Integrated Stroke Strategy for Ontario. Report of the Joint Stroke Strategy Working Group. [Toronto]: Ontario Ministry of Health and Long-Term Care and the Heart and Stroke Foundation of Ontario; 2000. Accessed on November 23, 2010, at http://www.health.gov.on.ca/english/public/pub/ministry_reports/stroke/strokereport.pdf.		
Kapral, 2011	Diagnostics (Assessments)	Swallowing (CVD)	Recommended that dysphagia screening is	Heart and Stroke Foundation of Canada. The Growing Burden of Heart Disease and Stroke in	Ontario Stroke System	Underuse (43.20%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
			essential to identify patients with stroke who have swallowing problems that put them at risk for aspiration.	Canada 2003. Ottawa: HSFC; 2003. Accessed on November 23, 2010, at http://www.cvdinfobase.ca/cvdbook/CVD_En03.pdf. Stroke Unit Trialists' Collaboration. Organised inpatient (stroke unit) care for stroke. Cochrane Database Syst Rev 2007; (4):CD000197. Chen ZM, Sandercock P, Pan HC, Counsell C, Collins R, Liu LS, et al. Indications for early aspirin use in acute ischemic stroke: A combined analysis of 40,000 randomized patients from the Chinese Acute Stroke Trial and the International Stroke Trial. Stroke 2000; 31(6):1240–9. The National Institute of Neurological Disorders and Stroke rt-PA Stroke Study Group. Tissue plasminogen activator for acute ischemic stroke. N Eng J Med 1995; 333(24):1581–7. Antithrombotic Trialists' Collaboration. Collaborative meta-analysis of randomised trials of antiplatelet therapy for prevention of death, myocardial infarction, and stroke in high risk patients. BMJ 2002; 324(7329):71–86. Saxena R, Koudstaal PJ. Anticoagulants for preventing stroke in patients with nonrheumatic atrial fibrillation and a history of stroke or transient ischemic attack. Cochrane Database Syst Rev 2002; (4):CD000185. Rothwell PM, Eliasziw M, Gutnikov SA, Fox AJ, Taylor DW, Mayberg MR, et al. Analysis of pooled data from the randomized controlled trials of endarterectomy for symptomatic carotid stenosis. Lancet 2003; 361(9352):107–16. Joint Stroke Strategy Working Group. Towards an Integrated Stroke Strategy for Ontario. Report of the Joint Stroke Strategy Working Group. [Toronto]:	(April 1, 2008-March 31, 2009)	

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				Ontario Ministry of Health and Long-Term Care and the Heart and Stroke Foundation of Ontario; 2000. Accessed on November 23, 2010, at http://www.health.gov.on.ca/english/public/pub/ministry_reports/stroke/strokereport.pdf.		
Keller, 2019	Diagnostics (Screening)	Nutrition (Hospitalized patients)	Recommended that the Subjective Global Assessment (SGA) is used as a nutritional status screening tool for patients requiring Specialized Nutrition Care (but also those with enteral/parenteral nutrition, transferred from critical care etc.).	Mueller C, Compher C, Dryan ME. A.S.P.E.N. Clinical Guidelines. Nutrition screening, assessment, and intervention in adults. J Parenter Enteral Nutr 2011;35(1):16e24. Cederholm T, Barazzoni R, Austin P, Ballmer P, Biolo G, Compher C, et al. ESPEN guidelines on definition and terminology of clinical nutrition. Clin Nutr 2017;36(1):49e64. Beck AM, Balkn UN, Fürst P, Hasunen K, Jones L, Keller U, et al. Food and nutritional care in hospitals: how to prevent under nutrition - report and guidelines from the Council of Europe. Clin Nutr 2001;20(5):455e60. Keller HH, McCullough J, Davidson B, Vesnaver E, Laporte M, Gramlich L, et al. The integrated nutrition pathway for acute care (INPAC): building consensus with a modified Delphi. Nutr J 2015;14(1):63. Laporte M, Keller H, Payette H, Allard JP, Duerksen DR, Bernier P, et al. Validity and reliability of the new Canadian Nutrition Screening tool in the 'real-world' hospital setting. Eur J Clin Nutr 2015;69(5):558e64. Detsky AS, Baker JP, Johnston N, Whittaker S, Mendelson RA, Jeejeebhoy KN. What is subjective global assessment of nutritional status? J Parenter Enteral Nutr 1987;11(1):8e13	Royal Alexandra Hospital; Niagara Health, Greater Niagara General Site; The Ottawa Hospital; Concordia Hospital, and Pasqua Hospital Regina Qu'Appelle Health Region (September 2015 - March 2017)	Underuse (100.00%)
Keller, 2019	Diagnostics (Screening)	Nutrition (Hospitalized patients)	Recommended that a nutritional assessment be completed for	Mueller C, Compher C, Dryan ME. A.S.P.E.N. Clinical Guidelines. Nutrition screening, assessment,	Royal Alexandra Hospital;	Underuse (67.00%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
			patients at admission to hospital, to determine patients at risk for malnutrition. Specific screening tool not specified in study.	and intervention in adults. J Parenter Enteral Nutr 2011;35(1):16e24. Cederholm T, Barazzoni R, Austin P, Ballmer P, Biolo G, Compher C, et al. ESPEN guidelines on definition and terminology of clinical nutrition. Clin Nutr 2017;36(1):49e64. Beck AM, Balkn UN, Fürst P, Hasunen K, Jones L, Keller U, et al. Food and nutritional care in hospitals: how to prevent under nutrition - report and guidelines from the Council of Europe. Clin Nutr 2001;20(5):455e60. Keller HH, McCullough J, Davidson B, Vesnaver E, Laporte M, Gramlich L, et al. The integrated nutrition pathway for acute care (INPAC): building consensus with a modified Delphi. Nutr J 2015;14(1):63. Laporte M, Keller H, Payette H, Allard JP, Duerksen DR, Bernier P, et al. Validity and reliability of the new Canadian Nutrition Screening tool in the 'real-world' hospital setting. Eur J Clin Nutr 2015;69(5):558e64. Detsky AS, Baker JP, Johnston N, Whittaker S, Mendelson RA, Jeejeebhoy KN. What is subjective global assessment of nutritional status? J Parenter Enteral Nutr 1987;11(1):8e13	Niagara Health, Greater Niagara General Site; The Ottawa Hospital; Concordia Hospital, and Pasqua Hospital Regina Qu'Appelle Health Region (September 2015 - March 2017)	
Khadilkar, 2014	Diagnostics (Blood tests)	Glycated Hemoglobin (HbA1c) (Diabetes Mellitus)	Not provided in study; Archived recommendation (2008); (from results, recommendation: patients with Type II Diabetes should receive an HbA1c test every 6 months).	Canadian Diabetes Association. Canadian Diabetes Association 2008 Clinical Practice Guidelines for the Prevention and Management of Diabetes in Canada. Can J Diabetes 2008;32(Suppl 1): S1e201. American Diabetes Association. Standards of Medical Care in Diabetes e 2011. Diabetes Care 2010;34(Suppl 1): S11e61. National Institute for Health and Clinical Excellence (NICE). Type 2 diabetes: The management of type 2	Not specified (July 2010-December 19, 2011)	Underuse (24.70%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				Diabetes 2009. http://www.nice.org.uk/nicemedia/live/12165/44320/44320.pdf		
Khadilkar, 2014	Therapeutics (Medications)	ACE Inhibitors OR ARB (Micro-albuminuria)	Not provided in study; (from results recommendation appear to be: patients with persistent microalbuminuria should be prescribed an ACE inhibitor or Angiotensin receptor blocker).	Canadian Diabetes Association. Canadian Diabetes Association 2008 Clinical Practice Guidelines for the Prevention and Management of Diabetes in Canada. Can J Diabetes 2008;32(Suppl 1): S1e201. American Diabetes Association. Standards of Medical Care in Diabetes e 2011. Diabetes Care 2010;34(Suppl 1): S11e61. National Institute for Health and Clinical Excellence (NICE). Type 2 diabetes: The management of type 2 Diabetes 2009. http://www.nice.org.uk/nicemedia/live/12165/44320/44320.pdf	Not specified (July 2010-December 19, 2011)	Underuse (9.10%)
Khadilkar, 2014	Diagnostics (Laboratory tests (non-blood tests))	Albumin-to-Creatinine Ratio (Diabetes Mellitus)	Not provided in study; Archived recommendation (2008); (from results recommendation appear to be: patients with Type II Diabetes should receive an ACR test within the year).	Canadian Diabetes Association. Canadian Diabetes Association 2008 Clinical Practice Guidelines for the Prevention and Management of Diabetes in Canada. Can J Diabetes 2008;32(Suppl 1): S1e201. American Diabetes Association. Standards of Medical Care in Diabetes e 2011. Diabetes Care 2010;34(Suppl 1): S11e61. National Institute for Health and Clinical Excellence (NICE). Type 2 diabetes: The management of type 2 Diabetes 2009. http://www.nice.org.uk/nicemedia/live/12165/44320/44320.pdf	Not specified (July 2010-December 19, 2011)	Underuse (32.60%)
Khadilkar, 2014	Therapeutics (Medications)	Antihyperglycemics (Diabetes Mellitus)	Not provided in study; Archived recommendation (2008); (from results, recommendation: patients with type II	Canadian Diabetes Association. Canadian Diabetes Association 2008 Clinical Practice Guidelines for the Prevention and Management of Diabetes in Canada. Can J Diabetes 2008;32(Suppl 1): S1e201.	Not specified (July 2010-December 19, 2011)	Underuse (1.10%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
			diabetes should be prescribed metformin).	American Diabetes Association. Standards of Medical Care in Diabetes e 2011. Diabetes Care 2010;34(Suppl 1): S11e61. National Institute for Health and Clinical Excellence (NICE). Type 2 diabetes: The management of type 2 Diabetes 2009. http://www.nice.org.uk/nicemedia/live/12165/44320/44320.pdf		
Khadilkar, 2014	Diagnostics (Assessments)	Blood Pressure (Diabetes Mellitus)	Not provided in study; Archived recommendation (2008); (from results recommendation appear to be: patients with Type II Diabetes should receive at least one blood pressure test at every visit).	Canadian Diabetes Association. Canadian Diabetes Association 2008 Clinical Practice Guidelines for the Prevention and Management of Diabetes in Canada. Can J Diabetes 2008;32(Suppl 1): S1e201. American Diabetes Association. Standards of Medical Care in Diabetes e 2011. Diabetes Care 2010;34(Suppl 1): S11e61. National Institute for Health and Clinical Excellence (NICE). Type 2 diabetes: The management of type 2 Diabetes 2009. http://www.nice.org.uk/nicemedia/live/12165/44320/44320.pdf	Not specified (July 2010-December 19, 2011)	Underuse (92.70%)
Khadilkar, 2014	Therapeutics (Psychosocial Therapy)	Counselling-Smoking Cessation (Diabetes Mellitus)	Not provided in study; Archived recommendation (2008); (from results, recommendation: smoking cessation advice provided for patients with Type II Diabetes).	Canadian Diabetes Association. Canadian Diabetes Association 2008 Clinical Practice Guidelines for the Prevention and Management of Diabetes in Canada. Can J Diabetes 2008;32(Suppl 1): S1e201. American Diabetes Association. Standards of Medical Care in Diabetes e 2011. Diabetes Care 2010;34(Suppl 1): S11e61. National Institute for Health and Clinical Excellence (NICE). Type 2 diabetes: The management of type 2 Diabetes 2009. http://www.nice.org.uk/nicemedia/live/12165/44320/44320.pdf	Not specified (July 2010-December 19, 2011)	Underuse (17.80%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
Khadilkar, 2014	Diagnostics (Assessments)	Electrocardiogram (Diabetes Mellitus)	Not provided in study; Archived recommendation (2008); (from results recommendation appear to be: patients with Type II Diabetes and over the age of 40 should receive an ECG test).	Canadian Diabetes Association. Canadian Diabetes Association 2008 Clinical Practice Guidelines for the Prevention and Management of Diabetes in Canada. Can J Diabetes 2008;32(Suppl 1): S1e201. American Diabetes Association. Standards of Medical Care in Diabetes e 2011. Diabetes Care 2010;34(Suppl 1): S11e61. National Institute for Health and Clinical Excellence (NICE). Type 2 diabetes: The management of type 2 Diabetes 2009. http://www.nice.org.uk/nicemedia/live/12165/44320/44320.pdf	Not specified (July 2010-December 19, 2011)	Underuse (3.60%)
Khadilkar, 2014	Diagnostics (Assessments)	Eye exams (Diabetes Mellitus)	Eye exam recommended every 1-2 years for patients with Type II Diabetes.	Canadian Diabetes Association. Canadian Diabetes Association 2008 Clinical Practice Guidelines for the Prevention and Management of Diabetes in Canada. Can J Diabetes 2008;32(Suppl 1): S1e201. American Diabetes Association. Standards of Medical Care in Diabetes e 2011. Diabetes Care 2010;34(Suppl 1): S11e61. National Institute for Health and Clinical Excellence (NICE). Type 2 diabetes: The management of type 2 Diabetes 2009. http://www.nice.org.uk/nicemedia/live/12165/44320/44320.pdf	Not specified (July 2010-December 19, 2011)	Underuse (22.90%)
Khadilkar, 2014	Diagnostics (Assessments)	Foot exams (Diabetes Mellitus)	Not provided in study; Archived recommendation (2008); (from results recommendation appear to be: patients with Type II Diabetes should receive an annual foot exam).	Canadian Diabetes Association. Canadian Diabetes Association 2008 Clinical Practice Guidelines for the Prevention and Management of Diabetes in Canada. Can J Diabetes 2008;32(Suppl 1): S1e201. American Diabetes Association. Standards of Medical Care in Diabetes e 2011. Diabetes Care 2010;34(Suppl 1): S11e61. National Institute for Health and Clinical Excellence (NICE). Type 2 diabetes: The management of type 2	Not specified (July 2010-December 19, 2011)	Underuse (84.10%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				Diabetes 2009. http://www.nice.org.uk/nicemedia/live/12165/44320/44320.pdf		
Khadilkar, 2014	Diagnostics (Blood tests)	Glomerular Filtration Rate (eGFR) (Diabetes Mellitus)	Not provided in study; Archived recommendation (2008); (from results recommendation appear to be: patients with Type II Diabetes should receive an annual eGFR test).	Canadian Diabetes Association. Canadian Diabetes Association 2008 Clinical Practice Guidelines for the Prevention and Management of Diabetes in Canada. Can J Diabetes 2008;32(Suppl 1): S1e201. American Diabetes Association. Standards of Medical Care in Diabetes e 2011. Diabetes Care 2010;34(Suppl 1): S11e61. National Institute for Health and Clinical Excellence (NICE). Type 2 diabetes: The management of type 2 Diabetes 2009. http://www.nice.org.uk/nicemedia/live/12165/44320/44320.pdf	Not specified (July 2010-December 19, 2011)	Underuse (24.40%)
Khadilkar, 2014	Therapeutics (Biophysical Therapy)	Influenza Vaccine (Diabetes Mellitus)	Not provided in study; Archived recommendation (2008); (from results recommendation appear to be: patients with Type II Diabetes should receive the influenza vaccination every year).	Canadian Diabetes Association. Canadian Diabetes Association 2008 Clinical Practice Guidelines for the Prevention and Management of Diabetes in Canada. Can J Diabetes 2008;32(Suppl 1): S1e201. American Diabetes Association. Standards of Medical Care in Diabetes e 2011. Diabetes Care 2010;34(Suppl 1): S11e61. National Institute for Health and Clinical Excellence (NICE). Type 2 diabetes: The management of type 2 Diabetes 2009. http://www.nice.org.uk/nicemedia/live/12165/44320/44320.pdf	Not specified (July 2010-December 19, 2011)	Underuse (56.60%)
Khadilkar, 2014	Diagnostics (Multiple Blood Tests)	Lipids (Various tests - e.g. total cholesterol, HDL, LDL, triglycerides) (Diabetes Mellitus)	Not provided in study; Archived recommendation (2008); (from results, recommendation: patients with Type II Diabetes should receive	Canadian Diabetes Association. Canadian Diabetes Association 2008 Clinical Practice Guidelines for the Prevention and Management of Diabetes in Canada. Can J Diabetes 2008;32(Suppl 1): S1e201.	Not specified (July 2010-December 19, 2011)	Underuse (3.20%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
			a lipid profile test every 1-3 years).	American Diabetes Association. Standards of Medical Care in Diabetes e 2011. Diabetes Care 2010;34(Suppl 1): S11e61. National Institute for Health and Clinical Excellence (NICE). Type 2 diabetes: The management of type 2 Diabetes 2009. http://www.nice.org.uk/nicemedia/live/12165/44320/44320.pdf		
Khadilkar, 2014	Diagnostics (Assessments)	Neuropathy test (Diabetes Mellitus)	Not provided in study; Archived recommendation (2008); (from results recommendation appear to be: patients with Type II Diabetes should receive an annual peripheral neuropathy test).	Canadian Diabetes Association. Canadian Diabetes Association 2008 Clinical Practice Guidelines for the Prevention and Management of Diabetes in Canada. Can J Diabetes 2008;32(Suppl 1): S1e201. American Diabetes Association. Standards of Medical Care in Diabetes e 2011. Diabetes Care 2010;34(Suppl 1): S11e61. National Institute for Health and Clinical Excellence (NICE). Type 2 diabetes: The management of type 2 Diabetes 2009. http://www.nice.org.uk/nicemedia/live/12165/44320/44320.pdf	Not specified (July 2010-December 19, 2011)	Underuse (89.70%)
Khoury, 2019	*Diagnostics (Multiple imaging results)*	Computed Tomography or Magnetic Resonance Imaging-Head + Lumbar (Not Specified)	Guidelines for completing a lumbar Computed Tomography (CT) or Magnetic Resonance Imaging (MRI) include suspected epidural abscess or hematoma presenting with acute pain, suspected cancer, suspected infection, cauda equina syndrome, severe or progressive neurologic deficit, suspected compression fracture, and suspected uncomplicated	Choosing Wisely Canada (2014). Recommendations: five things physicians and patients should question. Choosing Wisely Canada. (2014). Available at: http://www.choosingwiselycanada.org/recommendations/radiology/. Accessed April 2, 2017. Becker, W. J., Findlay, T., Moga, C., Scott, N. A., Harstall, C., & Taenzer, P. (2015). Guideline for primary care management of headache in adults. Can Fam Physician 61(8), 670–679. Eddy, K., Ednie, A., Connell, C., Eddy, R., Eaton, K., & Mathieson, J. (2013). Appropriate use of CT and MRI in British Columbia. BCMJ 55(1), 22–25.	Local family health teams (September 2016 - November 2016)	Overuse (12.00%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
			herniated disc or spinal stenosis after at least six weeks of conservative management. Guidelines for completing a Computed Tomography (CT) or Magnetic Resonance Imaging (MRI) head include complicated cases of headaches with any of the following red flags present: thunderclap onset, fever and meningismus, papilledema, unexplained focal neurological signs, and headache onset after 50 years of age. Rapid increase in frequency and severity, associated dizziness and lack of coordination, and history of cancer or immunodeficiency for uncomplicated headaches.			
Kirkham, 2015	Diagnostics (Imaging)	Radiography-Chest (Preoperative (low risk surgeries))	Recommended that preoperative testing (including chest radiography) should be avoided for patients undergoing endoscopy, ophthalmologic surgery or other low risk surgery (e.g., knee arthroscopy, hernia repair).	Canadian Cardiovascular Society. Cardiology: five things physi- cians and patients should question. Choosing Wisely Canada; 2014. Available: www.choosingwiselycanada.org/recommendations /cardiology/ (accessed 2015 May 14). Canadian Association of General Surgeons. Six things physicians and patients should question. Choosing Wisely Canada; 2014. Available: www.choosingwiselycanada.org/recommendations /general-surgery/ (accessed 2015 May 14).	Registered Persons Database; Discharge Abstract Database; Same Day Surgery database; Ontario Health Insurance Plan claims	Overuse (10.80%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				Canadian Society of Internal Medicine. Five things physicians and patients should question. Choosing Wisely Canada; 2014. Available: www.choosingwiselycanada.org/recommendations /internal-medicine/ (accessed 2015 May 13). Fleisher LA, Beckman JA, Brown KA, et al. ACC/AHA 2007 guidelines on perioperative cardiovascular evaluation and care for noncardiac surgery: a report of the American College of Cardiology/ American Heart Association Task Force on Practice Guidelines (Writing Committee to Revise the 2002 Guidelines on Perioperative Cardiovascular Evaluation for Noncardiac Surgery) developed in collaboration with the American Society of Echocardiography, American Society of Nuclear Cardiology, Heart Rhythm Society, Society of Cardiovascular Anesthesiologists, Society for Cardiovas- cular Angiography and Interventions, Society for Vascular Medi- cine and Biology, and Society for Vascular Surgery [published erra- tum in J Am Coll Cardiol 2008;52:793-4]. J Am Coll Cardiol 2007; 50: e159-241. Fleisher LA, Fleischmann KE, Auerbach AD, et al. 2014 ACC/ AHA guideline on perioperative cardiovascular evaluation and management of patients undergoing noncardiac surgery: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines. Circulation 2014;130: e278-333.	database; Institute for Clinical Evaluative Sciences Physician Database (April 1, 2008 - March 31, 2013; April 1, 2008 - March 31, 2009; April 1, 2009 - March 31, 2010; April 1, 2010 - March 31, 2011; April 1, 2011 - March 31, 2012; April 1, 2012 - March 31, 2013)	
Kirkham, 2015	Diagnostics (Imaging)	Transthoracic Echocardiogram (Preoperative (low risk surgeries))	Recommended that preoperative testing (including thoracic echocardiography) should be avoided for patients undergoing endoscopy, ophthalmologic surgery or other low risk	Canadian Cardiovascular Society. Cardiology: five things physi- cians and patients should question. Choosing Wisely Canada; 2014. Available: www.choosingwiselycanada.org/recommendations /cardiology/ (accessed 2015 May 14). Canadian Association of General Surgeons. Six things physicians and patients should question. Choosing Wisely Canada; 2014. Available:	Registered Persons Database; Discharge Abstract Database; Same Day Surgery database;	Overuse (2.90%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
			surgery (e.g., knee arthroscopy, hernia repair).	www.choosingwiselycanada.org/recommendations /general-surgery/ (accessed 2015 May 14). Canadian Society of Internal Medicine. Five things physicians and patients should question. Choosing Wisely Canada; 2014. Available: www.choosingwiselycanada.org/recommendations /internal-medicine/ (accessed 2015 May 13). Fleisher LA, Beckman JA, Brown KA, et al. ACC/AHA 2007 guidelines on perioperative cardiovascular evaluation and care for noncardiac surgery: a report of the American College of Cardiology/ American Heart Association Task Force on Practice Guidelines (Writing Committee to Revise the 2002 Guidelines on Perioperative Cardiovascular Evaluation for Noncardiac Surgery) developed in collaboration with the American Society of Echocardiography, American Society of Nuclear Cardiology, Heart Rhythm Society, Society of Cardiovascular Anesthesiologists, Society for Cardiovas- cular Angiography and Interventions, Society for Vascular Medi- cine and Biology, and Society for Vascular Surgery [published erra- tum in J Am Coll Cardiol 2008;52:793-4]. J Am Coll Cardiol 2007; 50: e159-241. Fleisher LA, Fleischmann KE, Auerbach AD, et al. 2014 ACC/ AHA guideline on perioperative cardiovascular evaluation and management of patients undergoing noncardiac surgery: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines. Circulation 2014;130: e278-333.	Ontario Health Insurance Plan claims database; Institute for Clinical Evaluative Sciences Physician Database (April 1, 2008 - March 31, 2013; April 1, 2008 - March 31, 2009; April 1, 2009 - March 31, 2010; April 1, 2010 - March 31, 2011; April 1, 2011 - March 31, 2012; April 1, 2012 - March 31, 2013)	
Kirkham, 2015	Diagnostics (Assessments)	Cardiac stress test (Preoperative Testing (low-risk surgeries))	Recommended that preoperative testing (including cardiac stress tests) should be avoided for patients undergoing endoscopy,	Canadian Cardiovascular Society. Cardiology: five things physi- cians and patients should question. Choosing Wisely Canada; 2014. Available: www.choosingwiselycanada.org/recommendations /cardiology/ (accessed 2015 May 14).	Registered Persons Database; Discharge Abstract Database;	Overuse (2.10%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
			ophthalmologic surgery or other low risk surgery (e.g., knee arthroscopy, hernia repair).	Canadian Association of General Surgeons. Six things physicians and patients should question. Choosing Wisely Canada; 2014. Available: www.choosingwiselycanada.org/recommendations /general-surgery/ (accessed 2015 May 14). Canadian Society of Internal Medicine. Five things physicians and patients should question. Choosing Wisely Canada; 2014. Available: www.choosingwiselycanada.org/recommendations /internal-medicine/ (accessed 2015 May 13). Fleisher LA, Beckman JA, Brown KA, et al. ACC/AHA 2007 guidelines on perioperative cardiovascular evaluation and care for noncardiac surgery: a report of the American College of Cardiology/ American Heart Association Task Force on Practice Guidelines (Writing Committee to Revise the 2002 Guidelines on Perioperative Cardiovascular Evaluation for Noncardiac Surgery) developed in collaboration with the American Society of Echocardiography, American Society of Nuclear Cardiology, Heart Rhythm Society, Society of Cardiovascular Anesthesiologists, Society for Cardiovas- cular Angiography and Interventions, Society for Vascular Medi- cine and Biology, and Society for Vascular Surgery [published erra- tum in J Am Coll Cardiol 2008;52:793-4]. J Am Coll Cardiol 2007; 50: e159-241. Fleisher LA, Fleischmann KE, Auerbach AD, et al. 2014 ACC/ AHA guideline on perioperative cardiovascular evaluation and management of patients undergoing noncardiac surgery: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines. Circulation 2014;130: e278-333.	Same Day Surgery database; Ontario Health Insurance Plan claims database; Institute for Clinical Evaluative Sciences Physician Database (April 1, 2008 - March 31, 2013; April 1, 2008 - March 31, 2009; April 1, 2009 - March 31, 2010; April 1, 2010 - March 31, 2011; April 1, 2011 - March 31, 2012; April 1, 2012 - March 31, 2013)	
Kirkham, 2015	Diagnostics (Assessments)	Electrocardiogram (Preoperative	Recommended that preoperative testing (including	Canadian Cardiovascular Society. Cardiology: five things physi- cians and patients should question. Choosing Wisely Canada; 2014. Available:	Registered Persons Database;	Overuse (31.00%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
		Testing (low-risk surgeries))	electrocardiogram) should be avoided for patients undergoing endoscopy, ophthalmologic surgery or other low risk surgery (e.g., knee arthroscopy, hernia repair).	www.choosingwiselycanada.org/recommendations /cardiology/ (accessed 2015 May 14). Canadian Association of General Surgeons. Six things physicians and patients should question. Choosing Wisely Canada; 2014. Available: www.choosingwiselycanada.org/recommendations /general-surgery/ (accessed 2015 May 14). Canadian Society of Internal Medicine. Five things physicians and patients should question. Choosing Wisely Canada; 2014. Available: www.choosingwiselycanada.org/recommendations /internal-medicine/ (accessed 2015 May 13). Fleisher LA, Beckman JA, Brown KA, et al. ACC/AHA 2007 guidelines on perioperative cardiovascular evaluation and care for noncardiac surgery: a report of the American College of Cardiology/ American Heart Association Task Force on Practice Guidelines (Writing Committee to Revise the 2002 Guidelines on Perioperative Cardiovascular Evaluation for Noncardiac Surgery) developed in collaboration with the American Society of Echocardiography, American Society of Nuclear Cardiology, Heart Rhythm Society, Society of Cardiovascular Anesthesiologists, Society for Cardiovas- cular Angiography and Interventions, Society for Vascular Medi- cine and Biology, and Society for Vascular Surgery [published erra- tum in J Am Coll Cardiol 2008;52:793-4]. J Am Coll Cardiol 2007; 50: e159-241. Fleisher LA, Fleischmann KE, Auerbach AD, et al. 2014 ACC/ AHA guideline on perioperative cardiovascular evaluation and management of patients undergoing noncardiac surgery: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines. Circulation 2014;130: e278-333.	Discharge Abstract Database; Same Day Surgery database; Ontario Health Insurance Plan claims database; Institute for Clinical Evaluative Sciences Physician Database (April 1, 2008 - March 31, 2013; April 1, 2008 - March 31, 2009; April 1, 2009 - March 31, 2010; April 1, 2010 - March 31, 2011; April 1, 2011 - March 31, 2012; April 1, 2012 - March 31, 2013)	

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
Kirkham, 2016	*Diagnostics (Multiple blood test results)*	CBC, PT, PTT and/or Metabolic panel (Preoperative (low-risk surgeries))	Guidelines do not recommend routine preoperative testing for ophthalmologic surgeries. This recommendation specifically includes complete blood count (CBC), basic or comprehensive metabolic panel, and coagulation studies developed through a comprehensive literature and membership survey process.	American Society of Anesthesiologists: Five Things Physicians and Patients Should Question. 2013. Available at: http:// www.choosingwisely.org/societies/american-society-of-anesthesiologists/. Accessed May 1, 2015 Onuoha OC, Arkoosh VA, Fleisher LA: Choosing wisely in anesthesiology: The gap between evidence and practice. JAMA Intern Med 2014; 174:1391–5 American Society for Clinical Pathology: Ten Things Physicians and Patients Should Question. 2015. Available at: http://www.choosingwisely.org/societies/american-societyfor-clinical-pathology/. Accessed May 1, 2015 Canadian Association of Pathologists: Five Things Physicians and Patients Should Question. 2014. Available at: http://www.choosingwiselycanada.org/recommendations/pathology/. Accessed February 6, 2015 Committee on Standards and Practice Parameters, Apfelbaum JL, Connis RT, Nickinovich DG; American Society of Anesthesiologists Task Force on Preanesthesia Evaluation, Pasternak LR, Arens JF, Caplan RA, Connis RT, Fleisher LA, Flowerdew R, Gold BS, Mayhew JF, Nickinovich DG, Rice LJ, Roizen MF, Twersky RS: Practice advisory for preanesthesia evaluation: An updated report by the American Society of Anesthesiologists Task Force on Preanesthesia Evaluation. Anesthesiology 2012; 116:522–38 Merchant R, Chartrand D, Dain S, Dobson G, Kurrek MM, Lagacé A, Stacey S, Thiessen B; Canadian Anesthesiologists' Society: Guidelines to the practice of anesthesia—Revised edition 2015. Can J Anaesth 2015; 62:54–67	Discharge Abstract Database; Same Day Surgery database; Ontario Health Insurance Plan database; the Registered Persons Database; the Institute for Clinical Evaluative Sciences Physician Database; the Canadian census (April 1, 2008 - March 31, 2013)	Overuse (36.80%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
Kirkham, 2016	*Diagnostics (Multiple blood test results)*	CBC, PT, PTT and/or Metabolic panel (Preoperative (low-risk surgeries))	Guidelines do not recommend routine preoperative testing for low-risk surgeries. This recommendation specifically includes complete blood count (CBC), basic or comprehensive metabolic panel, and coagulation studies developed through a comprehensive literature and membership survey process.	American Society of Anesthesiologists: Five Things Physicians and Patients Should Question. 2013. Available at: http:// www.choosingwisely.org/societies/american-society-of-anesthesiologists/. Accessed May 1, 2015 Onuoha OC, Arkoosh VA, Fleisher LA: Choosing wisely in anesthesiology: The gap between evidence and practice. JAMA Intern Med 2014; 174:1391–5 American Society for Clinical Pathology: Ten Things Physicians and Patients Should Question. 2015. Available at: http://www.choosingwisely.org/societies/american-societyfor-clinical-pathology/. Accessed May 1, 2015 Canadian Association of Pathologists: Five Things Physicians and Patients Should Question. 2014. Available at: http://www.choosingwiselycanada.org/recommendations/pathology/. Accessed February 6, 2015 Committee on Standards and Practice Parameters, Apfelbaum JL, Connis RT, Nickinovich DG; American Society of Anesthesiologists Task Force on Preanesthesia Evaluation, Pasternak LR, Arens JF, Caplan RA, Connis RT, Fleisher LA, Flowerdew R, Gold BS, Mayhew JF, Nickinovich DG, Rice LJ, Roizen MF, Twersky RS: Practice advisory for preanesthesia evaluation: An updated report by the American Society of Anesthesiologists Task Force on Preanesthesia Evaluation. Anesthesiology 2012; 116:522–38 Merchant R, Chartrand D, Dain S, Dobson G, Kurrek MM, Lagacé A, Stacey S, Thiessen B; Canadian Anesthesiologists' Society: Guidelines to the practice of anesthesia—Revised edition 2015. Can J Anaesth 2015; 62:54–67	Discharge Abstract Database; Same Day Surgery database; Ontario Health Insurance Plan database; the Registered Persons Database; the Institute for Clinical Evaluative Sciences Physician Database; the Canadian census (April 1, 2008 - March 31, 2013)	Overuse (63.20%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
Kirkham, 2020	Therapeutics (Medications)	Antipsychotics-medication(s) not specified (Antipsychotics (not specific to a health condition))	Clinical practice guidelines recommend nonpharmacologic treatment strategies as first-line approaches in the management of neuropsychiatric symptom(s) neuropsychiatric symptoms (NPS). Inappropriate antipsychotic prescribing, as measured by the antipsychotic use quality indicator, defined as the percentage of residents who received an antipsychotic without a diagnosis of psychosis on 1 or more days in the 7 days preceding the index RAI-MDS assessment, including regular or any as-needed use.	Conn D, Gibson M, McCabe D. CCSMH Guideline Update - The Assessment and Treatment of Mental Health Issues in Long-Term Care (Focus on Mood and Behaviour Symptoms). Toronto, Canada: Canadian Coalition for Seniors' Mental Health (CCSMH); 2014. p. 7e8.	The Resident Assessment Instrument-Minimum Dataset v2.0 (March 2016-July 2016)	Overuse (28.60%)
Kurdyak, 2017	Diagnostics (Multiple Blood Tests)	Lipids (Various tests - e.g., total cholesterol, HDL, LDL, triglycerides) (Diabetes Mellitus)	Not provided in study; Archived recommendation (2013) (from results, recommendation: patients with Type II Diabetes should receive at least one cholesterol test).	Canadian Diabetes Association Clinical Practice Guidelines Expert C, Cheng AY. Canadian Diabetes Association 2013 clinical practice guidelines for the prevention and management of diabetes in Canada. Introduction. Can J Diabetes 2013;37(Suppl. 1): S1–3. American Diabetes A. Standards of medical care in diabetes–2014. Diabetes Care 2014;37(Suppl. 1): S14–80	Ontario Health Insurance Plan; The Canadian Institute for Health Information Discharge Abstract Database;The Ontario Mental Health Reporting	Underuse (19.90%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
					System; The National Ambulatory Care Reporting System for Emergency Department visits; the Registered Persons Database; Statistics Canada 2001; Statistics Canada 2006 (April 1, 2011-March 31, 2013)	
Kurdyak, 2017	Diagnostics (Blood tests)	Glycated Hemoglobin (HbA1c) (Diabetes Mellitus)	Glycated hemoglobin (HbA1c) should be measured for most patients with diabetes mellitus once every 3 months to determine if the patient's glycemic goals are being met or maintained during treatment, or when glycemic targets are being consistently achieved, respectively.	Canadian Diabetes Association Clinical Practice Guidelines Expert C, Cheng AY. Canadian Diabetes Association 2013 clinical practice guidelines for the prevention and management of diabetes in Canada. Introduction. Can J Diabetes 2013;37(Suppl. 1): S1–3. American Diabetes A. Standards of medical care in diabetes–2014. Diabetes Care 2014;37(Suppl. 1): S14–80	Ontario Health Insurance Plan; The Canadian Institute for Health Information Discharge Abstract Database;The Ontario Mental Health Reporting System; The National Ambulatory Care Reporting System for Emergency Department	Underuse (62.30%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
					visits; the Registered Persons Database; Statistics Canada 2001; Statistics Canada 2006 (April 1, 2011-March 31, 2013)	
Kurdyak, 2017	Diagnostics (Assessments)	Eye exams (Diabetes Mellitus)	Not provided in study; Archived recommendation (2013) (from results, recommendation: patients with Type II Diabetes should receive at least one retinal eye exam).	Canadian Diabetes Association Clinical Practice Guidelines Expert C, Cheng AY. Canadian Diabetes Association 2013 clinical practice guidelines for the prevention and management of diabetes in Canada. Introduction. Can J Diabetes 2013;37(Suppl. 1): S1–3. American Diabetes A. Standards of medical care in diabetes–2014. Diabetes Care 2014;37(Suppl. 1): S14–80	Ontario Health Insurance Plan; The Canadian Institute for Health Information Discharge Abstract Database;The Ontario Mental Health Reporting System; The National Ambulatory Care Reporting System for Emergency Department visits; the Registered Persons Database; Statistics Canada 2001; Statistics Canada 2006	Underuse (33.00%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
					(April 1, 2011-March 31, 2013)	
Lake, 2020	Diagnostics (Blood tests)	Antinuclear Antibody (Not Specified)	Guidelines recommend only testing for Anti-nuclear Antibodies (ANA) if a patient's clinical history and physical examination show symptoms or signs suggestive of systemic lupus erythematosus, scleroderma, Sjögren syndrome, polymyositis or dermatomyositis. In addition, it is not appropriate to repeat ANA following a positive test result.	Fritzler MJ. Choosing Wisely: review and commentary on anti-nuclear antibody (ANA) testing. Autoimmun Rev 2016;15:272-80. Chow SL, Carter Thorne J, Bell MJ, et al. Choosing Wisely: the Canadian Rheumatology Association's list of 5 items physicians and patients should question. J Rheumatol 2015; 42:682-9. Yazdany J, Schmajuk G, Robbins M, et al. Choosing Wisely: the American College of Rheumatology's Top 5 list of things physicians and patients should question. Arthritis Care Res (Hoboken) 2013; 65:329-39. Solomon DH, Kavanaugh AJ, Schur PH, et al. Evidence-based guidelines for the use of immunologic tests: antinuclear antibody testing. Arthritis Rheum 2002; 47:434-44. Agmon-Levin N, Damoiseaux J, Kallenberg C, et al. International recommendations for the assessment of autoantibodies to cellular antigens referred to as anti-nuclear antibodies. Ann Rheum Dis 2014; 73:17-23. Five things physicians and patients should question [Choosing Wisely]. Philadelphia: American College of Rheumatology; 2013. Available: www.choosingwisely.org/societies/american-college-of-rheumatology-pediatric-rheumatology/ (accessed 2019 July 9).	Ontario Laboratories Information System: Ontario Health Insurance Plan Claims Database; Canadian Institute for Health Information Discharge Abstract Database; Registered Persons Database; ICES Physician Database (2008-2015)	Overuse (30.60%)
Landry, 2011	Diagnostics (Imaging)	Ultrasound-Abdominal (Not Specified)	Not explicitly stated in study. The indication(s) for these abdominal ultrasounds were not clearly indicated in accordance with the	"Canadian Association of Radiologists' 2005 guidelines" Qureshi AI, Alexandrov AV, Tegeler CH, Hobson RW, Baker JD, Hopkins LN. Guidelines for screening of extracranial carotid artery disease: a	Picture Archiving and Communications System (October 1,	Overuse (12.10%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
			Canadian Association of Radiologists' 2005 guidelines.	statement for healthcare professionals from the multidisciplinary practice guidelines committee of the American Society of Neuroimaging; cosponsored by the Society of Vascular and Interventional Neurology. J Neuroimaging 2007;17(1):19-47. American College of Radiology. ACR Appropriateness Criteria. Reston, VA: American College of Radiology; 2009. Available from: www.acr.org/ SecondaryMainMenuCategories/quality_safety/app_criteria.aspx.Accessed 2011 May 11.	2008 - June 30, 2009)	
Landry, 2011	Diagnostics (Imaging)	Ultrasound-Carotid (Not Specified)	Not explicitly stated in study. The indication(s) for these carotid ultrasounds were not clearly indicated in accordance with the Canadian Association of Radiologists' 2005 guidelines.	"Canadian Association of Radiologists' 2005 guidelines" Qureshi AI, Alexandrov AV, Tegeler CH, Hobson RW, Baker JD, Hopkins LN. Guidelines for screening of extracranial carotid artery disease: a statement for healthcare professionals from the multidisciplinary practice guidelines committee of the American Society of Neuroimaging; cosponsored by the Society of Vascular and Interventional Neurology. J Neuroimaging 2007;17(1):19-47. American College of Radiology. ACR Appropriateness Criteria. Reston, VA: American College of Radiology; 2009. Available from: www.acr.org/ SecondaryMainMenuCategories/quality_safety/app_criteria.aspx.Accessed 2011 May 11.	Picture Archiving and Communications System (October 1, 2008 - June 30, 2009)	Overuse (25.20%)
Landry, 2011	Diagnostics (Imaging)	Ultrasound-Pelvic (Not Specified)	Not explicitly stated in study. The indication(s) for these pelvic ultrasounds were not clearly indicated in accordance with the Canadian Association of Radiologists' 2005 guidelines.	"Canadian Association of Radiologists' 2005 guidelines" Qureshi AI, Alexandrov AV, Tegeler CH, Hobson RW, Baker JD, Hopkins LN. Guidelines for screening of extracranial carotid artery disease: a statement for healthcare professionals from the multidisciplinary practice guidelines committee of the American Society of Neuroimaging; cosponsored by	Picture Archiving and Communications System (October 1, 2008 - June 30, 2009)	Overuse (1.60%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				the Society of Vascular and Interventional Neurology. J Neuroimaging 2007;17(1):19-47. American College of Radiology. ACR Appropriateness Criteria. Reston, VA: American College of Radiology; 2009. Available from: www.acr.org/ SecondaryMainMenuCategories/quality_safety/app_criteria.aspx.Accessed 2011 May 11.		
Landry, 2011	Diagnostics (Imaging)	Ultrasound-Soft tissue (Not Specified)	Not explicitly stated in study. The indication(s) for these soft tissue ultrasounds were not clearly indicated in accordance with the Canadian Association of Radiologists' 2005 guidelines.	"Canadian Association of Radiologists' 2005 guidelines" Qureshi AI, Alexandrov AV, Tegeler CH, Hobson RW, Baker JD, Hopkins LN. Guidelines for screening of extracranial carotid artery disease: a statement for healthcare professionals from the multidisciplinary practice guidelines committee of the American Society of Neuroimaging; cosponsored by the Society of Vascular and Interventional Neurology. J Neuroimaging 2007;17(1):19-47. American College of Radiology. ACR Appropriateness Criteria. Reston, VA: American College of Radiology; 2009. Available from: www.acr.org/ SecondaryMainMenuCategories/quality_safety/app_criteria.aspx.Accessed 2011 May 11.	Picture Archiving and Communications System (October 1, 2008 - June 30, 2009)	Overuse (2.40%)
Landry, 2011	Diagnostics (Imaging)	Ultrasound-Thyroid (Not Specified)	Not explicitly stated in study. The indication(s) for these thyroid ultrasounds were not clearly indicated in accordance with the Canadian Association of Radiologists' 2005 guidelines.	"Canadian Association of Radiologists' 2005 guidelines" Qureshi AI, Alexandrov AV, Tegeler CH, Hobson RW, Baker JD, Hopkins LN. Guidelines for screening of extracranial carotid artery disease: a statement for healthcare professionals from the multidisciplinary practice guidelines committee of the American Society of Neuroimaging; cosponsored by the Society of Vascular and Interventional Neurology. J Neuroimaging 2007;17(1):19-47.	Picture Archiving and Communications System (October 1, 2008 - June 30, 2009)	Overuse (18.80%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				American College of Radiology. ACR Appropriateness Criteria. Reston, VA: American College of Radiology; 2009. Available from: www.acr.org/ SecondaryMainMenuCategories/quality_safety/app_criteria.aspx.Accessed 2011 May 11.		
Lee, 2011	Therapeutics (Biophysical Therapy)	Implantable Cardioverter Defibrillator Therapy (Cardiovascular Arrhythmia)	An ICD is indicated for either primary or secondary prevention. Such implantable defibrillators are used for primary prevention when the patient has not yet experienced a lethal arrhythmia or cardiac arrest but might be at future risk for such an event. Implantable defibrillators are used for secondary prevention when patients have had a cardiac arrest or experienced a potentially lethal ventricular arrhythmia and survived the episode.	Lee DS, Birnie D, Cameron D, et al. Design and implementation of a population-based registry of implantable cardioverter defibrillators (ICDs) in Ontario. Heart Rhythm. 2008; 5(9):1250–6. Bardy GH, Lee KL, Mark DB, et al. Amiodarone or an implantable cardioverter-defibrillator for congestive heart failure. N Engl J Med. 2005; 352(3):225–37. Moss AJ. MADIT-II: Substudies and their implications. Card Electrophysiol Rev. 2003; 7(4):430–3. Daubert JP, Moss AJ, Cannom DS, et al. Inappropriate implantable cardioverter-defibrillator shocks in MADIT II. J Am Coll Cardiol, 2008; 51(14):1357–65. Moss AJ, Zareba W, Hall WJ, et al. Prophylactic implantation of a defibrillator in patients with myocardial infarction and reduced ejection fraction. N Engl J Med. 2002; 346(12):877–83. Lee DS, Tran C, Flintoft VF, et al. CCORT/CCS quality indicators for congestive heart failure care. Can J Cardiol 2003; 19:357 364. Tang AS, Ross H, Simpson CS, et al. Canadian Cardiovascular Society/Canadian Heart Rhythm Society position paper on implantable cardioverter defibrillator use in Canada. Can J Cardiol 2005;21 Suppl A:11A–18A.]	Ontario Implantable Cardioverter Defibrillator Database (February 15, 2007-September 30, 2009)	Overuse (3.50%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
Liddy, 2012	Diagnostics (Blood tests)	Fasting blood glucose (CVD)	Recommendation for the frequency of test not specified in study; (from results, recommendation: cardiovascular disease management for patients with Coronary Artery Disease should receive a fasting blood glucose test).	Baskerville NB, Liddy C, Hogg W. Systematic review and meta-analysis of practice facilitation within primary care settings. Ann Fam Med. 2012;10(1):63–74 Liddy C, Hogg W, Russell G, Wells G, Armstrong CD, Akbari A, et al. Improved Delivery of Cardiovascular Care (IDOCC) through outreach facilitation: study protocol and implementation details of a cluster randomized controlled trial in primary care. Implement Sci. 2011; 6:110.	Not specified (April 2007-March 2012)	Underuse (20.00%)
Liddy, 2012	Therapeutics (Medications)	Smoking Cessation-Drug Unknown (CVD)	Not provided in study; (from results, recommendation: patients that smoke should receive a smoking cessation drug for cardiovascular disease management).	Baskerville NB, Liddy C, Hogg W. Systematic review and meta-analysis of practice facilitation within primary care settings. Ann Fam Med. 2012;10(1):63–74 Liddy C, Hogg W, Russell G, Wells G, Armstrong CD, Akbari A, et al. Improved Delivery of Cardiovascular Care (IDOCC) through outreach facilitation: study protocol and implementation details of a cluster randomized controlled trial in primary care. Implement Sci. 2011; 6:110.	Not specified (April 2007-March 2012)	Underuse (76.90%)
Liddy, 2012	Diagnostics (Assessments)	Waist circumference (CVD)	Not provided in study; (from results, recommendation: patients that smoke should have their waist circumference measured for cardiovascular disease management).	Baskerville NB, Liddy C, Hogg W. Systematic review and meta-analysis of practice facilitation within primary care settings. Ann Fam Med. 2012;10(1):63–74 Liddy C, Hogg W, Russell G, Wells G, Armstrong CD, Akbari A, et al. Improved Delivery of Cardiovascular Care (IDOCC) through outreach facilitation: study protocol and implementation details of a cluster randomized controlled trial in primary care. Implement Sci. 2011; 6:110.	Not specified (April 2007-March 2012)	Underuse (90.10%)
Liddy, 2012	Diagnostics (Referrals)	Smoking Cessation Program (CVD)	Not provided in study; (from results, recommendation: patients that smoke	Baskerville NB, Liddy C, Hogg W. Systematic review and meta-analysis of practice facilitation within primary care settings. Ann Fam Med. 2012;10(1):63–74	Not specified (April 2007-March 2012)	Underuse (92.30%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
			should attend a smoking cessation program for cardiovascular disease management).	Liddy C, Hogg W, Russell G, Wells G, Armstrong CD, Akbari A, et al. Improved Delivery of Cardiovascular Care (IDOCC) through outreach facilitation: study protocol and implementation details of a cluster randomized controlled trial in primary care. Implement Sci. 2011; 6:110.		
Liddy, 2012	Diagnostics (Multiple Blood Tests)	Lipids (Various tests - e.g., total cholesterol, HDL, LDL, triglycerides) (Dyslipidemia)	Not provided in study; (from results, recommendation: cardiovascular disease management for patients with Dyslipidemia should receive a lipid profile test).	Baskerville NB, Liddy C, Hogg W. Systematic review and meta-analysis of practice facilitation within primary care settings. Ann Fam Med. 2012;10(1):63–74 Liddy C, Hogg W, Russell G, Wells G, Armstrong CD, Akbari A, et al. Improved Delivery of Cardiovascular Care (IDOCC) through outreach facilitation: study protocol and implementation details of a cluster randomized controlled trial in primary care. Implement Sci. 2011; 6:110.	Not specified (April 2007-March 2012)	Underuse (17.20%)
Liddy, 2012	Therapeutics (Medications)	Multiple Medications (Cardiovascular) (CVD)	Prescribed beta-blocker in patients with a depressed left ventricular ejection fraction (LVEF) (<35% or ≤40%). Lipid-lowering drugs, and specifically statins if tolerated, would be expected evidence-based therapy in all CAD patients. Other eligible antihypertensive therapy, in addition to ACEI, ARB and beta-blocker (including sotalol) therapy, were diuretics and calcium channel blockers. An angiotensin-converting	Baskerville NB, Liddy C, Hogg W. Systematic review and meta-analysis of practice facilitation within primary care settings. Ann Fam Med. 2012;10(1):63–74 Liddy C, Hogg W, Russell G, Wells G, Armstrong CD, Akbari A, et al. Improved Delivery of Cardiovascular Care (IDOCC) through outreach facilitation: study protocol and implementation details of a cluster randomized controlled trial in primary care. Implement Sci. 2011; 6:110.	Not specified (April 2007-March 2012)	Underuse (70.20%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
			enzyme inhibitor (ACEi) and/or angiotensin receptor blocker (ARB) would be recommended evidence-based therapy in patients with diabetes, hypertension, depressed LVEF (<35%or ≤40%), or chronic kidney disease (defined as estimated glomerular filtration rate [eGFR] <60 ml/minute.			
Liddy, 2012	Therapeutics (Medications)	Antihyperglycemics (Diabetes Mellitus)	Not provided in study; (from results, recommendation: patients with type II diabetes should be prescribed glycemic control medication for cardiovascular disease management).	Baskerville NB, Liddy C, Hogg W. Systematic review and meta-analysis of practice facilitation within primary care settings. Ann Fam Med. 2012;10(1):63–74 Liddy C, Hogg W, Russell G, Wells G, Armstrong CD, Akbari A, et al. Improved Delivery of Cardiovascular Care (IDOCC) through outreach facilitation: study protocol and implementation details of a cluster randomized controlled trial in primary care. Implement Sci. 2011; 6:110.	Not specified (April 2007-March 2012)	Underuse (19.50%)
Liddy, 2012	Therapeutics (Medications)	Antihypertensive - Drug Unknown (Hypertension)	Not provided in study; (from results, recommendation: patients with hypertension should be prescribed anti-hypertensive medication for cardiovascular disease management).	Baskerville NB, Liddy C, Hogg W. Systematic review and meta-analysis of practice facilitation within primary care settings. Ann Fam Med. 2012;10(1):63–74 Liddy C, Hogg W, Russell G, Wells G, Armstrong CD, Akbari A, et al. Improved Delivery of Cardiovascular Care (IDOCC) through outreach facilitation: study protocol and implementation details of a cluster randomized controlled trial in primary care. Implement Sci. 2011; 6:110.	Not specified (April 2007-March 2012)	Underuse (5.80%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
Liddy, 2012	Diagnostics (Assessments)	Blood Pressure (CVD)	Not provided in study; (from results, recommendation: cardiovascular disease management for patients with Coronary Artery Disease should have received 2 blood pressure tests during study period).	Baskerville NB, Liddy C, Hogg W. Systematic review and meta-analysis of practice facilitation within primary care settings. Ann Fam Med. 2012;10(1):63–74 Liddy C, Hogg W, Russell G, Wells G, Armstrong CD, Akbari A, et al. Improved Delivery of Cardiovascular Care (IDOCC) through outreach facilitation: study protocol and implementation details of a cluster randomized controlled trial in primary care. Implement Sci. 2011; 6:110.	Not specified (April 2007-March 2012)	Underuse (25.20%)
Liddy, 2012	Diagnostics (Assessments)	Blood Pressure (CVD)	Not provided in study; (from results, recommendation: cardiovascular disease management for patients with Coronary Artery Disease should have received 2 blood pressure tests during study period).	Baskerville NB, Liddy C, Hogg W. Systematic review and meta-analysis of practice facilitation within primary care settings. Ann Fam Med. 2012;10(1):63–74 Liddy C, Hogg W, Russell G, Wells G, Armstrong CD, Akbari A, et al. Improved Delivery of Cardiovascular Care (IDOCC) through outreach facilitation: study protocol and implementation details of a cluster randomized controlled trial in primary care. Implement Sci. 2011; 6:110.	Not specified (April 2007-March 2012)	Underuse (20.60%)
Liddy, 2012	Diagnostics (Imaging)	Carotid Imaging/Doppler (CVD)	Not provided in study; (from results, recommendation: patients that experienced a stroke in the past year should receive imaging from a carotid doppler).	Baskerville NB, Liddy C, Hogg W. Systematic review and meta-analysis of practice facilitation within primary care settings. Ann Fam Med. 2012;10(1):63–74 Liddy C, Hogg W, Russell G, Wells G, Armstrong CD, Akbari A, et al. Improved Delivery of Cardiovascular Care (IDOCC) through outreach facilitation: study protocol and implementation details of a cluster randomized controlled trial in primary care. Implement Sci. 2011; 6:110.	Not specified (April 2007-March 2012)	Underuse (40.40%)
Liddy, 2012	Diagnostics (Imaging)	Computed Tomography-Head (CVA)	Not provided in study; (from results, recommendation: cardiovascular disease management for stroke	Baskerville NB, Liddy C, Hogg W. Systematic review and meta-analysis of practice facilitation within primary care settings. Ann Fam Med. 2012;10(1):63–74	Not specified (April 2007-March 2012)	Underuse (33.80%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
			patients should receive a CT head scan).	Liddy C, Hogg W, Russell G, Wells G, Armstrong CD, Akbari A, et al. Improved Delivery of Cardiovascular Care (IDOCC) through outreach facilitation: study protocol and implementation details of a cluster randomized controlled trial in primary care. Implement Sci. 2011; 6:110.		
Liddy, 2012	Therapeutics (Psychosocial Therapy)	Counselling-Smoking Cessation (CVD)	Not provided in study; (from results, recommendation: patients that smoke should receive smoking cessation counselling for cardiovascular disease management).	Baskerville NB, Liddy C, Hogg W. Systematic review and meta-analysis of practice facilitation within primary care settings. Ann Fam Med. 2012;10(1):63–74 Liddy C, Hogg W, Russell G, Wells G, Armstrong CD, Akbari A, et al. Improved Delivery of Cardiovascular Care (IDOCC) through outreach facilitation: study protocol and implementation details of a cluster randomized controlled trial in primary care. Implement Sci. 2011; 6:110.	Not specified (April 2007-March 2012)	Underuse (47.20%)
Liddy, 2012	Diagnostics (Referrals)	Dietician/Weight Loss Program (CVD)	Not provided in study; (from results, recommendation: obese patients should visit a dietician or attend a weight loss program for cardiovascular disease management).	Baskerville NB, Liddy C, Hogg W. Systematic review and meta-analysis of practice facilitation within primary care settings. Ann Fam Med. 2012;10(1):63–74 Liddy C, Hogg W, Russell G, Wells G, Armstrong CD, Akbari A, et al. Improved Delivery of Cardiovascular Care (IDOCC) through outreach facilitation: study protocol and implementation details of a cluster randomized controlled trial in primary care. Implement Sci. 2011; 6:110.	Not specified (April 2007-March 2012)	Underuse (81.80%)
Liddy, 2012	Diagnostics (Imaging)	Echocardiogram (CVD)	Not provided in study; (from results, recommendation: cardiovascular disease management for stroke patients should receive an echo cardiogram).	Baskerville NB, Liddy C, Hogg W. Systematic review and meta-analysis of practice facilitation within primary care settings. Ann Fam Med. 2012;10(1):63–74 Liddy C, Hogg W, Russell G, Wells G, Armstrong CD, Akbari A, et al. Improved Delivery of Cardiovascular Care (IDOCC) through outreach facilitation: study protocol and implementation	Not specified (April 2007-March 2012)	Underuse (52.10%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				details of a cluster randomized controlled trial in primary care. Implement Sci. 2011; 6:110.		
Liddy, 2012	Diagnostics (Assessments)	Electrocardiogram (CVD)	Not provided in study; (from results, recommendation: cardiovascular disease management for patients that experienced a stroke in the past year should receive an ECG test).	Baskerville NB, Liddy C, Hogg W. Systematic review and meta-analysis of practice facilitation within primary care settings. Ann Fam Med. 2012;10(1):63–74 Liddy C, Hogg W, Russell G, Wells G, Armstrong CD, Akbari A, et al. Improved Delivery of Cardiovascular Care (IDOCC) through outreach facilitation: study protocol and implementation details of a cluster randomized controlled trial in primary care. Implement Sci. 2011; 6:110.	Not specified (April 2007-March 2012)	Underuse (47.90%)
Liddy, 2012	Diagnostics (Blood tests)	Glomerular Filtration Rate (eGFR) (Diabetes Mellitus)	Not provided in study; (from results, recommendation: cardiovascular disease management for patients with Type II Diabetes should receive an Estimate Glomerular Filtration Rate (eGFR) test).	Baskerville NB, Liddy C, Hogg W. Systematic review and meta-analysis of practice facilitation within primary care settings. Ann Fam Med. 2012;10(1):63–74 Liddy C, Hogg W, Russell G, Wells G, Armstrong CD, Akbari A, et al. Improved Delivery of Cardiovascular Care (IDOCC) through outreach facilitation: study protocol and implementation details of a cluster randomized controlled trial in primary care. Implement Sci. 2011; 6:110.	Not specified (April 2007-March 2012)	Underuse (16.20%)
Liddy, 2012	Therapeutics (Medications)	Lipid Lowering - Drug Unknown (Dyslipidemia)	Not provided in study; (from results, recommendation: patients with dyslipidemia should be prescribed lipid lowering medication for cardiovascular disease management).	Baskerville NB, Liddy C, Hogg W. Systematic review and meta-analysis of practice facilitation within primary care settings. Ann Fam Med. 2012;10(1):63–74 Liddy C, Hogg W, Russell G, Wells G, Armstrong CD, Akbari A, et al. Improved Delivery of Cardiovascular Care (IDOCC) through outreach facilitation: study protocol and implementation details of a cluster randomized controlled trial in primary care. Implement Sci. 2011; 6:110.	Not specified (April 2007-March 2012)	Underuse (8.50%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
Liddy, 2012	Diagnostics (Multiple Blood Tests)	Lipids (Various tests - e.g., total cholesterol, HDL, LDL, triglycerides) (CVD)	Not provided in study; (from results, recommendation: cardiovascular disease management for patients with Coronary Artery Disease should receive a lipid profile test).	Baskerville NB, Liddy C, Hogg W. Systematic review and meta-analysis of practice facilitation within primary care settings. Ann Fam Med. 2012;10(1):63–74 Liddy C, Hogg W, Russell G, Wells G, Armstrong CD, Akbari A, et al. Improved Delivery of Cardiovascular Care (IDOCC) through outreach facilitation: study protocol and implementation details of a cluster randomized controlled trial in primary care. Implement Sci. 2011; 6:110.	Not specified (April 2007-March 2012)	Underuse (22.30%)
Liddy, 2012	Diagnostics (Blood tests)	Glycated Hemoglobin (HbA1c) (Diabetes Mellitus)	Not provided in study; (from results, recommendation: patients with Type II Diabetes should receive 2 hemoglobin A1c (HbA1c) tests for cardiovascular disease management).	Baskerville NB, Liddy C, Hogg W. Systematic review and meta-analysis of practice facilitation within primary care settings. Ann Fam Med. 2012;10(1):63–74 Liddy C, Hogg W, Russell G, Wells G, Armstrong CD, Akbari A, et al. Improved Delivery of Cardiovascular Care (IDOCC) through outreach facilitation: study protocol and implementation details of a cluster randomized controlled trial in primary care. Implement Sci. 2011; 6:110.	Not specified (April 2007-March 2012)	Underuse (45.10%)
Liddy, 2012	Diagnostics (Laboratory tests (non-blood tests))	Albumin-to-Creatinine Ratio (Diabetes Mellitus)	Not provided in study; (from results, recommendation: cardiovascular disease management for patients with Type II Diabetes should receive an Albumin-to-creatinine ratio (ACR) test).	Baskerville NB, Liddy C, Hogg W. Systematic review and meta-analysis of practice facilitation within primary care settings. Ann Fam Med. 2012;10(1):63–74 Liddy C, Hogg W, Russell G, Wells G, Armstrong CD, Akbari A, et al. Improved Delivery of Cardiovascular Care (IDOCC) through outreach facilitation: study protocol and implementation details of a cluster randomized controlled trial in primary care. Implement Sci. 2011; 6:110.	Not specified (April 2007-March 2012)	Underuse (44.20%)
Liddy, 2012	Diagnostics (Blood tests)	Fasting blood glucose (CVD)	Recommendation for the frequency of test not specified in study; (from results,	Baskerville NB, Liddy C, Hogg W. Systematic review and meta-analysis of practice facilitation within primary care settings. Ann Fam Med. 2012;10(1):63–74	Not specified (April 2007-March 2012)	Underuse (21.10%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
			recommendation: cardiovascular disease management for patients with Peripheral Vascular Disease should receive a fasting blood glucose test).	Liddy C, Hogg W, Russell G, Wells G, Armstrong CD, Akbari A, et al. Improved Delivery of Cardiovascular Care (IDOCC) through outreach facilitation: study protocol and implementation details of a cluster randomized controlled trial in primary care. Implement Sci. 2011; 6:110.		
Liddy, 2012	Diagnostics (Blood tests)	Fasting blood glucose (CVD)	Recommendation for the frequency of test not specified in study; (from results, recommendation: cardiovascular disease management for stroke patients should receive a fasting blood glucose test).	Baskerville NB, Liddy C, Hogg W. Systematic review and meta-analysis of practice facilitation within primary care settings. Ann Fam Med. 2012;10(1):63–74 Liddy C, Hogg W, Russell G, Wells G, Armstrong CD, Akbari A, et al. Improved Delivery of Cardiovascular Care (IDOCC) through outreach facilitation: study protocol and implementation details of a cluster randomized controlled trial in primary care. Implement Sci. 2011; 6:110.	Not specified (April 2007-March 2012)	Underuse (23.10%)
Liddy, 2012	Therapeutics (Medications)	ACE inhibitor, ARB or beta blocker (CVD)	Not provided in study; (from results, recommendation: patients with coronary artery disease should be prescribed ACE inhibitor, Angiotensin receptor blocker, or beta blockers).	Baskerville NB, Liddy C, Hogg W. Systematic review and meta-analysis of practice facilitation within primary care settings. Ann Fam Med. 2012;10(1):63–74 Liddy C, Hogg W, Russell G, Wells G, Armstrong CD, Akbari A, et al. Improved Delivery of Cardiovascular Care (IDOCC) through outreach facilitation: study protocol and implementation details of a cluster randomized controlled trial in primary care. Implement Sci. 2011; 6:110.	Not specified (April 2007-March 2012)	Underuse (11.50%)
Liddy, 2012	Therapeutics (Medications)	Acetylsalicylic Acid (CVD)	Not provided in study; (from results, recommendation: patients with coronary artery disease should be prescribed ASA for cardiovascular disease management).	Baskerville NB, Liddy C, Hogg W. Systematic review and meta-analysis of practice facilitation within primary care settings. Ann Fam Med. 2012;10(1):63–74 Liddy C, Hogg W, Russell G, Wells G, Armstrong CD, Akbari A, et al. Improved Delivery of Cardiovascular Care (IDOCC) through outreach facilitation: study protocol and implementation	Not specified (April 2007-March 2012)	Underuse (24.00%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				details of a cluster randomized controlled trial in primary care. Implement Sci. 2011; 6:110.		
Liddy, 2012	Therapeutics (Medications)	Acetylsalicylic Acid (CVD)	Not provided in study; (from results, recommendation: patients with peripheral vascular disease should be prescribed ASA for cardiovascular disease management).	Baskerville NB, Liddy C, Hogg W. Systematic review and meta-analysis of practice facilitation within primary care settings. Ann Fam Med. 2012;10(1):63–74 Liddy C, Hogg W, Russell G, Wells G, Armstrong CD, Akbari A, et al. Improved Delivery of Cardiovascular Care (IDOCC) through outreach facilitation: study protocol and implementation details of a cluster randomized controlled trial in primary care. Implement Sci. 2011; 6:110.	Not specified (April 2007-March 2012)	Underuse (24.20%)
Liddy, 2012	Therapeutics (Medications)	Acetylsalicylic Acid (CVD)	Not provided in study; (from results, recommendation: stroke patients should be prescribed ASA for cardiovascular disease management).	Baskerville NB, Liddy C, Hogg W. Systematic review and meta-analysis of practice facilitation within primary care settings. Ann Fam Med. 2012;10(1):63–74 Liddy C, Hogg W, Russell G, Wells G, Armstrong CD, Akbari A, et al. Improved Delivery of Cardiovascular Care (IDOCC) through outreach facilitation: study protocol and implementation details of a cluster randomized controlled trial in primary care. Implement Sci. 2011; 6:110.	Not specified (April 2007-March 2012)	Underuse (21.10%)
Liddy, 2012	Diagnostics (Laboratory tests (non-blood tests))	Albumin-to-Creatinine Ratio (Chronic Kidney Disease)	Not provided in study; (from results, recommendation: cardiovascular disease management for patients with Chronic Kidney Disease should receive an Albumin-to-creatinine ratio (ACR) test).	Baskerville NB, Liddy C, Hogg W. Systematic review and meta-analysis of practice facilitation within primary care settings. Ann Fam Med. 2012;10(1):63–74 Liddy C, Hogg W, Russell G, Wells G, Armstrong CD, Akbari A, et al. Improved Delivery of Cardiovascular Care (IDOCC) through outreach facilitation: study protocol and implementation details of a cluster randomized controlled trial in primary care. Implement Sci. 2011; 6:110.	Not specified (April 2007-March 2012)	Underuse (48.40%)
Ma, 2017	Diagnostics (Blood tests)	Glycated hemoglobin	Glycated hemoglobin (HbA1c) should be	American Society for Clinical Pathology Choosing Wisely Recommendations, 2015. Available at:	Laboratory Information	Overuse (22.90%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
		(HbA1c) (Diabetes mellitus)	measured for most patients with diabetes mellitus once every 3 months to determine if the patient's glycemic goals are being met or maintained during treatment, or when glycemic targets are being consistently achieved, respectively; Conversely, nondiabetic patients should be screened up to every 1–3 years for diabetes using HbA1c and/or fasting plasma glucose, depending on their risk factors for diabetes.	http://www.choosingwisely.org/clinician-lists/american-society-clinical-pathology-suspected-thyroid-disease-evaluation/. Accessed: 3 July 2016. The Canadian Society of Endocrinology and Metabolism Choosing Wisely Canada Recommendations, 2014. Available at: http://www.choosingwiselycanada.org/recommendations/endocrinology-and-metabolism/. Accessed: 3 July 2016 Jonklaas J, Bianco AC, Bauer AJ, Burman KD, Cappola AR, Celi FS, et al. Guidelines for the treatment of hypothyroidism: prepared by the american thyroid association task force on thyroid hormone replacement. Thyroid 2014; 24:1670–751. Garber JR, Cobin RH, Gharib H, Hennessey JV, Klein I, Mechanick JI, et al. Clinical practice guidelines for hypothyroidism in adults: cosponsored by the American Association of Clinical Endocrinologists and the American Thyroid Association. Thyroid 2012; 22:1200–35. Endocrine Society Choosing Wisely Recommendations 2013 [Available from: http://www.choosingwisely.org/societies/endocrine-society/. Accessed: 3 July 2016. Endocrine Society of Australia Choosing Wisely Australia Recommendations, 2016. Available at: http://www.choosingwisely.org.au/getmedia/ffe150c6-0cae-4fa4-a1c5-97d93360c297/CW_Recommendations_ESA_v5.pdf.aspx. Accessed: 3 July 2016.	Systems in Alberta – Cerner Millennium for Calgary, Sunquest for Edmonton, and MediTech for the remaining zones of Alberta. (January 2013-December 2016)	
Maclagan, 2017	*Therapeutics (Multiple medication results)*	Potentially Inappropriate Medications-Benzodiazepines, H2-receptor	The 2015 American Geriatrics Society Beers Criteria were used to identify PIM use for drug-disease/syndrome	American Geriatrics Society 2015 Beers Criteria Update Expert Panel. American Geriatrics Society 2015 updated beers criteria for potentially inappropriate medication use in older adults. J Am Geriatr Soc 2015; 63:2227–2246	Canadian Institute for Health Information Continuing	Overuse (44.30%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
		Antagonists, Antipsychotics, Anticholinergic medications (Studies of Potentially Inappropriate Medications)	interactions in older adults with dementia or cognitive impairment. The four subclasses of medications included were benzodiazepines, H2-receptor antagonists, antipsychotics, and drugs with strong anticholinergic properties; these are collectively referred to as subclasses in the analysis.		Care Reporting System; Resident Assessment Instrument Minimum Dataset; The Registered Persons Database; Ontario Drug Benefit database (April 1, 2011-March 31, 2014)	
MacMillan, 2018	Diagnostics (Blood tests)	Red blood cell folate (Not Specified)	Both serum and red blood cell (RBC) folate tests lack sensitivity and specificity, and there is no established gold standard for folate deficiency, suggesting that these tests are of limited value. As a result, some advocate for empirical treatment with folate supplementation rather than laboratory testing in patients with suspected folate deficiency.	Canadian Agency for Drugs and Technologies in Health. Folate testing: A review of the diagnostic accuracy, clinical utility, cost-effectiveness and guidelines. CADTH: rapid response reports. 2015: 1-37.	University Health Network Hospitals (April 2010 - March 2013; April 2013 - March 2016)	Overuse (0.30%)
Marin, 2020	*Therapeutics (Multiple medication results)*	Potentially Inappropriate Medications-medications not specified (End-stage Kidney Disease)	Not explicitly provided in study; from results, recommendation: Patients with End-Stage Kidney Disease (ESKD) received a potentially	By the American Geriatrics Society 2015 Beers Criteria Update Expert Panel. American geriatrics society 2015 updated beers criteria for potentially inappropriate medication use in older adults. J Am Geriatr Soc. 2015;63(11):2227-2246.	Patient Records and Outcomes Management Information System (June 3, 2015-	Overuse (97.30%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
			inappropriate medication. According to the study, a potentially inappropriate medication with either no clear evidence-based indication or a higher risk of adverse effects in accordance with American Geriatrics Society 2015 Beers Criteria Update.		October 1, 2015)	
Martel, 2018	Diagnostics (Laboratory tests (non-blood tests))	Oncotype-DX Prognostic Tool (Breast Cancer)	Oncotype dx is a prognostic tool that is currently recommended by major clinical practice guidelines in patients with node-negative, hormone receptor–positive, her2-negative breast cancer.	Direction québecoise de cancérologie. Utilisation du test Oncotype DX pour le cancer du sein: Cadre de référence. Quebec City, QC: Gouvernement du Québec; 2012. [Available online at: http://publications.msss.gouv.qc.ca/msss /fichiers/2012/12-902-09W.pdf; cited 29 May 2017]	Genomic Health (May 2012 - December 2014)	Underuse (7.00%)
Martin, 2015	Therapeutics (Medications)	Antimicrobials--medication(s) not specified (Staphylococcus Aureus Bacteremia)	Correct duration of antibiotics was defined as 14 +/− 2 days for uncomplicated SAB or 28-42 +/− 2 days for complicated SAB. Antibiotic duration was only counted as appropriate if clinicians had selected an antibiotic that would adequately treat *S. aureus* as per the guideline and policy, inclusive of cefazolin, cloxacillin, vancomycin, or daptomycin.	Thwaites GE, Edgeworth JD, Gkrania-Klotsas E, Kirby A, Tilley R, TöröK ME, et al. Clinical management of Staphylococcus aureus bacteraemia. Lancet Infect Dis. 2011;11(3):208–22. Liu C, Bayer A, Cosgrove SE, Daum RS, Fridkin SK, Gorwitz RJ, et al. Clinical practice guidelines by the Infectious Diseases Society of America for the treatment of methicillin-resistant Staphylococcus aureus infections in adults and children. Clin Infect Dis. 2011; 52:18–55. Baddour LM, Wilson WR, Bayer AS, Fowler VG Jr, Bolger AF, Levison ME, et al. Infective endocarditis: diagnosis, antimicrobial therapy, and management of complications: a statement for healthcare professionals from the committee on rheumatic fever, endocarditis, and Kawasaki disease, council on cardiovascular disease in the young, and the councils	Hamilton Health Sciences (January 1, 2011- December 31, 2011)	Overuse (11.80%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				on clinical cardiology, stroke, and cardiovascular surgery and anesthesia, American Heart Association: endorsed by the Infectious Diseases Society of America. Circulation. 2005;111(23):394–434.		
Martin, 2015	Diagnostics (Imaging)	Trans-thoracic Echocardiogram (Staphylococcus Aureus Bacteremia)	Guidelines recommend the completion of a trans-thoracic echocardiogram (TEE/TTE) as part of treatment for Staphylococcus Aureus Bacteremia (SAB).	Thwaites GE, Edgeworth JD, Gkrania-Klotsas E, Kirby A, Tilley R, TöröK ME, et al. Clinical management of Staphylococcus aureus bacteraemia. Lancet Infect Dis. 2011;11(3):208–22. Liu C, Bayer A, Cosgrove SE, Daum RS, Fridkin SK, Gorwitz RJ, et al. Clinical practice guidelines by the Infectious Diseases Society of America for the treatment of methicillin-resistant Staphylococcus aureus infections in adults and children. Clin Infect Dis. 2011; 52:18–55. Baddour LM, Wilson WR, Bayer AS, Fowler VG Jr, Bolger AF, Levison ME, et al. Infective endocarditis: diagnosis, antimicrobial therapy, and management of complications: a statement for healthcare professionals from the committee on rheumatic fever, endocarditis, and Kawasaki disease, council on cardiovascular disease in the young, and the councils on clinical cardiology, stroke, and cardiovascular surgery and anesthesia, American Heart Association: endorsed by the Infectious Diseases Society of America. Circulation. 2005;111(23):394–434.	Hamilton Health Sciences (January 1, 2011-December 31, 2011)	Underuse (14.70%)
Martin, 2015	Diagnostics (Blood tests)	Blood cultures (Staphylococcus Aureus Bacteremia)	Guideline recommends obtaining follow-up blood cultures within 3 days of antibiotic initiation for treatment of Staphylococcus Aureus Bacteremia (SAB).	Thwaites GE, Edgeworth JD, Gkrania-Klotsas E, Kirby A, Tilley R, TöröK ME, et al. Clinical management of Staphylococcus aureus bacteraemia. Lancet Infect Dis. 2011;11(3):208–22. Liu C, Bayer A, Cosgrove SE, Daum RS, Fridkin SK, Gorwitz RJ, et al. Clinical practice guidelines by the Infectious Diseases Society of America for the treatment of methicillin-resistant Staphylococcus aureus infections in adults and children. Clin Infect Dis. 2011; 52:18–55.	Hamilton Health Sciences (January 1, 2011-December 31, 2011)	Underuse (12.70%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				Baddour LM, Wilson WR, Bayer AS, Fowler VG Jr, Bolger AF, Levison ME, et al. Infective endocarditis: diagnosis, antimicrobial therapy, and management of complications: a statement for healthcare professionals from the committee on rheumatic fever, endocarditis, and Kawasaki disease, council on cardiovascular disease in the young, and the councils on clinical cardiology, stroke, and cardiovascular surgery and anesthesia, American Heart Association: endorsed by the Infectious Diseases Society of America. Circulation. 2005;111(23):394–434.		
Martin, 2018	Therapeutics (Biophysical Therapy)	Enhanced Recovery After Surgery (ERAS Bundle) (Colorectal Surgery)	The ERAS guideline for colorectal surgery includes the following care elements; Preoperative Care Elements: Preadmission counseling, Nutrition risk screening, Fluid and carbohydrate loading, No prolonged fasting, No/selective bowel preparation, Antibiotic prophylaxis, Thromboprophylaxis, No premedication; Intraoperative Care Elements: Nausea and vomiting prophylaxis, Short-acting anesthetic agents, Midthoracic epidural anesthesia/analgesia, No drains, Avoidance of salt and water overload, Maintenance of normothermia (body warmer/warm intravenous fluids); Postoperative Care	Sandrucci S, Beets G, Braga M, Dejong K, Demartines N. Perioperative nutrition and enhanced recovery after surgery in gastrointestinal cancer patients. A position paper by the ESSO Task Force in collaboration with the ERAS Society (ERAS Coalition). Eur J Surg Oncol.2018;44(4):509-514. Wischmeyer PE, Carli F, Evans DC, et al. American Society for Enhanced Recovery and Perioperative Quality Initiative Joint Consensus Statement on Nutrition Screening and Therapy Within a Surgical Enhanced Recovery Pathway. Anesth Analg. 2018;126(6):1883-1895 Grant MC, Yang D, Wu CL, Makary MA, Wick EC. Impact of enhanced recovery after surgery and fast track surgery pathways on healthcare-associated infections: results from a systematic review and meta-analysis. Ann Surg. 2017;265(1):68-79. Greco M, Capretti G, Beretta L, Gemma M, Pecorelli N, Braga M. Enhanced recovery program in colorectal surgery: a meta-analysis of randomized controlled trials. World JSurg. 2014; 38:1531-1541. Visioni A, Shah R, Gabriel E, Attwood K, Kukar M, Nurkin S. Enhanced recovery after surgery for noncolorectal surgery? A systematic review and	ERAS Interactive Audit System (September 2013 - December 2016)	Underuse (48.80%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
			Elements: Midthoracic epidural anesthesia/analgesia, No nasogastric tubes, Prevention of nausea and vomiting, Avoidance of salt and water overload, Early removal of catheter, Early oral nutrition, Nonopioid oral analgesia/ nonsteroidal anti-inflammatory drugs, Early mobilization, Stimulation of gut motility, Audit of compliance and outcomes.	meta-analysis of major abdominal surgery. Ann Surg. 2018;267(1):57-65. Lau CSM, Chamberlain RS. Enhanced recovery after surgery programs improve patient outcomes and recovery: a meta-analysis. World JSurg. 2017;41(4):899-913. Arends J, Bachmann P, Baracos V, et al. ESPEN guidelines on nutrition in cancer patients. Clin Nutr. 2017;36(1):11-48. Gustafsson UO, Scott MJ, Schwenk W, et al. Guidelines for perioperative care in elective colonic surgery: Enhanced Recovery After Surgery (ERAS(R)) Society recommendations. Clin Nutr. 2012;31(6): 783-800.		
Martin, 2019	Therapeutics (Medications)	Antihyperglycemics-medication(s) not specified (Studies of Potentially Inappropriate Medications)	Not explicitly stated in study; (from results, recommendation: sedative-hypnotics are potentially inappropriate for older adults according to Beers Criteria).	The American Geriatrics Society 2015 Beers Criteria Update Expert Panel. American Geriatrics Society 2015 updated Beers Criteria for potentially inappropriate medication use in older adults.J Am Geriatr Soc. 2015;63(11):2227-2246. doi:10.1111/jgs.13702	3 different pharmacy chains within a 100-km radius of the research center in Montreal, Canada (February 2014-September 2017)	Overuse (13.80%)
Martin, 2019	Therapeutics (Medications)	Nonsteroidal Anti-inflammatory Drugs-medication(s) not specified (Studies of Potentially Inappropriate Medications)	Indication, dose or frequency not stated in study; the following NSAIDs are considered to be potentially inappropriate in these older adults according to the Beers Criteria.	The American Geriatrics Society 2015 Beers Criteria Update Expert Panel. American Geriatrics Society 2015 updated Beers Criteria for potentially inappropriate medication use in older adults.J Am Geriatr Soc. 2015;63(11):2227-2246. doi:10.1111/jgs.13702	3 different pharmacy chains within a 100-km radius of the research center in Montreal, Canada	Overuse (21.70%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
					(February 2014-September 2017)	
Martin, 2019	Therapeutics (Medications)	Sedative-Hypnotics-multiple medications-medications not specified (Studies of Potentially Inappropriate Medications)	Not explicitly stated in study; (from results, recommendation: sedative-hypnotics are potentially inappropriate for older adults according to Beers Criteria).	The American Geriatrics Society 2015 Beers Criteria Update Expert Panel. American Geriatrics Society 2015 updated Beers Criteria for potentially inappropriate medication use in older adults.J Am Geriatr Soc. 2015;63(11):2227-2246. doi:10.1111/jgs.13702	3 different pharmacy chains within a 100-km radius of the research center in Montreal, Canada (February 2014-September 2017)	Overuse (9.00%)
McAlister, 2018	*Diagnostics (Multiple imaging results)*	Cardiac Imaging (Coronary Computed Tomography, Cardiac Stress Test) (CVD)	Guidelines do not recommend preoperative coronary CT scan or cardiac stress tests before non-cardiac surgery. Guidelines do not recommend carotid artery imaging without history of stroke or TIA or patients with syncope but no history of stroke or TIA.	Choosing Wisely (www.choosingwisely. org) and the 'Do not do' recommendations from the National Institute for Health and Care Excellence (www. nice. org. uk)	Discharge Abstract Database; Ambulatory Care Database; Physician Claims Database; Laboratory and Diagnostic Imaging Databases; Alberta Health Care Insurance Registry (2012 - 2015)	Overuse (1.00%)
McAlister, 2018	Diagnostics (Blood tests)	Prostate-specific Antigen (Suspected Prostate Cancer)	Guidelines do not recommend prostate-specific antigen (PSA) testing for men 75 or	Choosing Wisely (www.choosingwisely. org) and the 'Do not do' recommendations from the National Institute for Health and Care Excellence (www. nice. org. uk)	Discharge Abstract Database; Ambulatory Care	Overuse (55.50%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
			older with no history of prostate cancer.		Database; Physician Claims Database; Laboratory and Diagnostic Imaging Databases; Alberta Health Care Insurance Registry (2012 - 2015)	
McAlister, 2018	Diagnostics (Imaging)	Carotid Imaging/Doppler (CVD)	Guidelines do not recommend carotid artery imaging but without history of stroke or TIA.	Choosing Wisely (www.choosingwisely. org) and the 'Do not do' recommendations from the National Institute for Health and Care Excellence (www. nice. org. uk)	Discharge Abstract Database; Ambulatory Care Database; Physician Claims Database; Laboratory and Diagnostic Imaging Databases; Alberta Health Care Insurance Registry (2012 - 2015)	Overuse (0.09%)
McAlister, 2018	Diagnostics (Screening)	Colorectal Cancer Screening-tests not specified (Colorectal Cancer (Sreening-75+ Years))	Guidelines do not recommend colorectal cancer screening in people 75 years or older.	Choosing Wisely (www.choosingwisely. org) and the 'Do not do' recommendations from the National Institute for Health and Care Excellence (www. nice. org. uk)	Discharge Abstract Database; Ambulatory Care Database; Physician Claims	Overuse (1.70%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
					Database; Laboratory and Diagnostic Imaging Databases; Alberta Health Care Insurance Registry (2012 - 2015)	
McAlister, 2018	Diagnostics (Imaging)	Dual X-ray Absorptiometry (DEXA) Scan (Osteoporosis)	Guidelines do not recommend Bone Mineral Density (BMD) testing within 2 years of prior scan.	Choosing Wisely (www.choosingwisely. org) and the 'Do not do' recommendations from the National Institute for Health and Care Excellence (www. nice. org. uk)	Discharge Abstract Database; Ambulatory Care Database; Physician Claims Database; Laboratory and Diagnostic Imaging Databases; Alberta Health Care Insurance Registry (2012 - 2015)	Overuse (11.60%)
McAlister, 2018	Diagnostics (Blood tests)	Homocysteine (CVD)	Guidelines do not recommend homocysteine testing without B12 or folate testing or history of B12/folate deficiency. This result is the percentage of 'at-risk' people receiving this low-value care at least once in the 3 years.	Choosing Wisely (www.choosingwisely. org) and the 'Do not do' recommendations from the National Institute for Health and Care Excellence (www. nice. org. uk)	Discharge Abstract Database; Ambulatory Care Database; Physician Claims Database; Laboratory and	Overuse (0.40%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
					Diagnostic Imaging Databases; Alberta Health Care Insurance Registry (2012 - 2015)	
McAlister, 2018	Diagnostics (Blood tests)	Hypercoagulability testing (Deep Vein Thrombosis/Pulmonary Embolism)	Guidelines do not recommend hypercoagulability testing in patients with first DVT/PE. This result is the percentage of 'at-risk' people receiving this low-value care at least once in the 3 years.	Choosing Wisely (www.choosingwisely. org) and the 'Do not do' recommendations from the National Institute for Health and Care Excellence (www. nice. org. uk)	Discharge Abstract Database; Ambulatory Care Database; Physician Claims Database; Laboratory and Diagnostic Imaging Databases; Alberta Health Care Insurance Registry (2012 - 2015)	Overuse (3.50%)
McAlister, 2018	Diagnostics (Screening)	Papanicolaou (Pap) test (Cervical Cancer (Screening))	Guidelines do not recommend cervical cancer screening for women over 65 with no history of cervical dysplasia or genital cancer.	Choosing Wisely (www.choosingwisely. org) and the 'Do not do' recommendations from the National Institute for Health and Care Excellence (www. nice. org. uk)	Discharge Abstract Database; Ambulatory Care Database; Physician Claims Database; Laboratory and Diagnostic Imaging Databases;	Overuse (15.70%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
					Alberta Health Care Insurance Registry (2012 - 2015)	
McBride, 2019	Diagnostics (Imaging)	Breast Cancer Imaging (Mammograms, breast ultrasounds, and breast MRIs) (Breast Cancer (in remission))	Guidelines recommend surveillance imaging for breast cancer survivors as one test (mammograms, breast ultrasounds and breast MRIs) per follow-up year after breast cancer remission.	Khatcheressian JL, Wolff, AC, Smith TJ, Grunfeld E, Muss HB, ogel VG, Halberg F, Somerfield MR, Davidson NE. American Society of Clinical Oncology 2006 update of the breast cancer follow-up and management guidelines in the adjuvant setting. JCO. 2006;24(31):7. Khatcheressian JL, Hurley P, Bantug E, Esserman LJ, Grunfeld E, Halberg F, Hantel A, Henry NL, Muss HB, Smith TJ, Vogel VG, Wolff AC, Somerfield MR, Davidson NE. Breast Cancer Follow-Up and Management After Primary Treatment: American Society of Clinical Oncology Clinical Practice Guideline Update. J Clin Oncol. 2013;31(7):5. Grunfeld E, Dhesy-Thind S, Levine M. Clinical practice guidelines for the care and treatment of breast cancer: follow-up after treatment for breast cancer (summary of the 2005 update). CMAJ. 2005;172(10):2.	Provincial cancer registries and provincial healthcare insurance plan registries for British Columbia, Manitoba, Nova Scotia and Ontario (2007 - December 31, 2013; 2007 - October 1, 2013; 2007 - March 31, 2015; 2007 - December 31, 2011)	Underuse (35.80%)
McBride, 2019	*Diagnostics (Multiple Diagnostics)*	Cervical Cancer Assessment (multiple components) (Cervical Cancer)	At least one cervical cancer screen for patients aged 20–69 during the entire follow-up period, with no previous cervical cancer, endometrial and ovarian cancer, and no hysterectomy history, was counted as adherence.	Khatcheressian JL, Wolff, AC, Smith TJ, Grunfeld E, Muss HB, ogel VG, Halberg F, Somerfield MR, Davidson NE. American Society of Clinical Oncology 2006 update of the breast cancer follow-up and management guidelines in the adjuvant setting. JCO. 2006;24(31):7. Khatcheressian JL, Hurley P, Bantug E, Esserman LJ, Grunfeld E, Halberg F, Hantel A, Henry NL, Muss HB, Smith TJ, Vogel VG, Wolff AC, Somerfield MR, Davidson NE. Breast Cancer Follow-Up and Management After Primary Treatment: American Society of Clinical Oncology Clinical Practice Guideline Update. J Clin Oncol. 2013;31(7):5.	Provincial cancer registries and provincial healthcare insurance plan registries for British Columbia, Manitoba, Nova Scotia and Ontario (2007 - December 31, 2013; 2007 -	Underuse (29.70%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				Grunfeld E, Dhesy-Thind S, Levine M. Clinical practice guidelines for the care and treatment of breast cancer: follow-up after treatment for breast cancer (summary of the 2005 update). CMAJ. 2005;172(10):2.	October 1, 2013; 2007 - March 31, 2015; 2007 - December 31, 2011)	
McBride, 2019	Diagnostics (Assessments)	Chronic Stable Angina (Breast Cancer)	Appropriate physician visit frequency for breast cancer survivors with Chronic Stable Angina was defined as one visit every 6 months.	Khatcheressian JL, Wolff, AC, Smith TJ, Grunfeld E, Muss HB, ogel VG, Halberg F, Somerfield MR, Davidson NE. American Society of Clinical Oncology 2006 update of the breast cancer follow-up and management guidelines in the adjuvant setting. JCO. 2006;24(31):7. Khatcheressian JL, Hurley P, Bantug E, Esserman LJ, Grunfeld E, Halberg F, Hantel A, Henry NL, Muss HB, Smith TJ, Vogel VG, Wolff AC, Somerfield MR, Davidson NE. Breast Cancer Follow-Up and Management After Primary Treatment: American Society of Clinical Oncology Clinical Practice Guideline Update. J Clin Oncol. 2013;31(7):5. Grunfeld E, Dhesy-Thind S, Levine M. Clinical practice guidelines for the care and treatment of breast cancer: follow-up after treatment for breast cancer (summary of the 2005 update). CMAJ. 2005;172(10):2.	Provincial cancer registries and provincial healthcare insurance plan registries for British Columbia, Manitoba, Nova Scotia and Ontario (2007 - December 31, 2013; 2007 - October 1, 2013; 2007 - March 31, 2015; 2007 - December 31, 2011)	Underuse (32.80%)
McBride, 2019	*Diagnostics (Multiple Diagnostics)*	Colorectal Cancer Assessment (multiple components) (Colorectal Cancer)	Guideline was considered adherent when at least one colon cancer screening event for women aged 50–64 during follow-up was completed.	Khatcheressian JL, Wolff, AC, Smith TJ, Grunfeld E, Muss HB, ogel VG, Halberg F, Somerfield MR, Davidson NE. American Society of Clinical Oncology 2006 update of the breast cancer follow-up and management guidelines in the adjuvant setting. JCO. 2006;24(31):7. Khatcheressian JL, Hurley P, Bantug E, Esserman LJ, Grunfeld E, Halberg F, Hantel A, Henry NL, Muss HB, Smith TJ, Vogel VG, Wolff AC, Somerfield MR, Davidson NE. Breast Cancer Follow-Up and Management After Primary Treatment: American Society of Clinical Oncology Clinical Practice Guideline Update. J Clin Oncol. 2013;31(7):5.	Provincial cancer registries and provincial healthcare insurance plan registries for British Columbia, Manitoba, Nova Scotia and Ontario (2007 - December 31,	Underuse (51.60%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				Grunfeld E, Dhesy-Thind S, Levine M. Clinical practice guidelines for the care and treatment of breast cancer: follow-up after treatment for breast cancer (summary of the 2005 update). CMAJ. 2005;172(10):2.	2013; 2007 - October 1, 2013; 2007 - March 31, 2015; 2007 - December 31, 2011)	
McBride, 2019	*Diagnostics (Multiple imaging results)*	Combined Surveillance Breast Imaging (Mammograms, Breast Ultrasounds and Breast Magnetic Resonance Imaging) (Breast Cancer Survivors)	Guidelines recommend surveillance imaging for breast cancer survivors as one test (mammograms, breast ultrasounds and breast MRIs) per follow-up year after breast cancer remission.	Khatcheressian JL, Wolff, AC, Smith TJ, Grunfeld E, Muss HB, ogel VG, Halberg F, Somerfield MR, Davidson NE. American Society of Clinical Oncology 2006 update of the breast cancer follow-up and management guidelines in the adjuvant setting. JCO. 2006;24(31):7. Khatcheressian JL, Hurley P, Bantug E, Esserman LJ, Grunfeld E, Halberg F, Hantel A, Henry NL, Muss HB, Smith TJ, Vogel VG, Wolff AC, Somerfield MR, Davidson NE. Breast Cancer Follow-Up and Management After Primary Treatment: American Society of Clinical Oncology Clinical Practice Guideline Update. J Clin Oncol. 2013;31(7):5. Grunfeld E, Dhesy-Thind S, Levine M. Clinical practice guidelines for the care and treatment of breast cancer: follow-up after treatment for breast cancer (summary of the 2005 update). CMAJ. 2005;172(10):2.	Provincial cancer registries and provincial healthcare insurance plan registries for British Columbia, Manitoba, Nova Scotia and Ontario (2007 - December 31, 2013; 2007 - October 1, 2013; 2007 - March 31, 2015; 2007 - December 31, 2011)	Overuse (4.00%)
McBride, 2019	Diagnostics (Assessments)	Congestive Heart Failure (Breast Cancer)	Appropriate physician visit frequency for breast cancer survivors with Congestive Heart Failure was defined as one visit every 6 months.	Khatcheressian JL, Wolff, AC, Smith TJ, Grunfeld E, Muss HB, ogel VG, Halberg F, Somerfield MR, Davidson NE. American Society of Clinical Oncology 2006 update of the breast cancer follow-up and management guidelines in the adjuvant setting. JCO. 2006;24(31):7. Khatcheressian JL, Hurley P, Bantug E, Esserman LJ, Grunfeld E, Halberg F, Hantel A, Henry NL, Muss HB, Smith TJ, Vogel VG, Wolff AC, Somerfield MR, Davidson NE. Breast Cancer Follow-Up and Management After Primary Treatment: American	Provincial cancer registries and provincial healthcare insurance plan registries for British Columbia, Manitoba, Nova Scotia and Ontario (2007 -	Underuse (26.70%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				Society of Clinical Oncology Clinical Practice Guideline Update. J Clin Oncol. 2013;31(7):5. Grunfeld E, Dhesy-Thind S, Levine M. Clinical practice guidelines for the care and treatment of breast cancer: follow-up after treatment for breast cancer (summary of the 2005 update). CMAJ. 2005;172(10):2.	December 31, 2013; 2007 - October 1, 2013; 2007 - March 31, 2015; 2007 - December 31, 2011)	
McBride, 2019	Diagnostics (Assessments)	COPD (Breast Cancer)	Appropriate physician visit frequency for breast cancer survivors with Chronic Obstructive Pulmonary Disease was defined as one visit every 6 months.	Khatcheressian JL, Wolff, AC, Smith TJ, Grunfeld E, Muss HB, ogel VG, Halberg F, Somerfield MR, Davidson NE. American Society of Clinical Oncology 2006 update of the breast cancer follow-up and management guidelines in the adjuvant setting. JCO. 2006;24(31):7. Khatcheressian JL, Hurley P, Bantug E, Esserman LJ, Grunfeld E, Halberg F, Hantel A, Henry NL, Muss HB, Smith TJ, Vogel VG, Wolff AC, Somerfield MR, Davidson NE. Breast Cancer Follow-Up and Management After Primary Treatment: American Society of Clinical Oncology Clinical Practice Guideline Update. J Clin Oncol. 2013;31(7):5. Grunfeld E, Dhesy-Thind S, Levine M. Clinical practice guidelines for the care and treatment of breast cancer: follow-up after treatment for breast cancer (summary of the 2005 update). CMAJ. 2005;172(10):2.	Provincial cancer registries and provincial healthcare insurance plan registries for British Columbia, Manitoba, Nova Scotia and Ontario (2007 - December 31, 2013; 2007 - October 1, 2013; 2007 - March 31, 2015; 2007 - December 31, 2011)	Underuse (33.70%)
McBride, 2019	Diagnostics (Assessments)	Diabetes (Breast Cancer Survivors)	Appropriate physician visit frequency for breast cancer survivors with Diabetes was defined as one visit every 6 months.	Khatcheressian JL, Wolff, AC, Smith TJ, Grunfeld E, Muss HB, ogel VG, Halberg F, Somerfield MR, Davidson NE. American Society of Clinical Oncology 2006 update of the breast cancer follow-up and management guidelines in the adjuvant setting. JCO. 2006;24(31):7. Khatcheressian JL, Hurley P, Bantug E, Esserman LJ, Grunfeld E, Halberg F, Hantel A, Henry NL, Muss HB, Smith TJ, Vogel VG, Wolff AC, Somerfield MR, Davidson NE. Breast Cancer Follow-Up and	Provincial cancer registries and provincial healthcare insurance plan registries for British Columbia, Manitoba, Nova Scotia	Underuse (19.10%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				Management After Primary Treatment: American Society of Clinical Oncology Clinical Practice Guideline Update. J Clin Oncol. 2013;31(7):5. Grunfeld E, Dhesy-Thind S, Levine M. Clinical practice guidelines for the care and treatment of breast cancer: follow-up after treatment for breast cancer (summary of the 2005 update). CMAJ. 2005;172(10):2.	and Ontario (2007 - December 31, 2013; 2007 - October 1, 2013; 2007 - March 31, 2015; 2007 - December 31, 2011)	
McBride, 2019	Diagnostics (Imaging)	Dual X-ray Absorptiometry Scan (Osteoporosis)	Guideline adherence was considered when at least one bone densitometry was completed during breast cancer follow-up for women aged 65 years or older.	Khatcheressian JL, Wolff, AC, Smith TJ, Grunfeld E, Muss HB, ogel VG, Halberg F, Somerfield MR, Davidson NE. American Society of Clinical Oncology 2006 update of the breast cancer follow-up and management guidelines in the adjuvant setting. JCO. 2006;24(31):7. Khatcheressian JL, Hurley P, Bantug E, Esserman LJ, Grunfeld E, Halberg F, Hantel A, Henry NL, Muss HB, Smith TJ, Vogel VG, Wolff AC, Somerfield MR, Davidson NE. Breast Cancer Follow-Up and Management After Primary Treatment: American Society of Clinical Oncology Clinical Practice Guideline Update. J Clin Oncol. 2013;31(7):5. Grunfeld E, Dhesy-Thind S, Levine M. Clinical practice guidelines for the care and treatment of breast cancer: follow-up after treatment for breast cancer (summary of the 2005 update). CMAJ. 2005;172(10):2.	Provincial cancer registries and provincial healthcare insurance plan registries for British Columbia, Manitoba, Nova Scotia and Ontario (2007 - December 31, 2013; 2007 - October 1, 2013; 2007 - March 31, 2015; 2007 - December 31, 2011)	Underuse (66.40%)
McBride, 2019	Diagnostics (Assessments)	Transient Ischemic Attack (Breast Cancer)	Appropriate physician visit frequency for breast cancer survivors with Transient Ischemic Attack was defined as yearly visits.	Khatcheressian JL, Wolff, AC, Smith TJ, Grunfeld E, Muss HB, ogel VG, Halberg F, Somerfield MR, Davidson NE. American Society of Clinical Oncology 2006 update of the breast cancer follow-up and management guidelines in the adjuvant setting. JCO. 2006;24(31):7. Khatcheressian JL, Hurley P, Bantug E, Esserman LJ, Grunfeld E, Halberg F, Hantel A, Henry NL, Muss HB, Smith TJ, Vogel VG, Wolff AC, Somerfield	Provincial cancer registries and provincial healthcare insurance plan registries for British Columbia, Manitoba,	Underuse (28.50%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				MR, Davidson NE. Breast Cancer Follow-Up and Management After Primary Treatment: American Society of Clinical Oncology Clinical Practice Guideline Update. J Clin Oncol. 2013;31(7):5. Grunfeld E, Dhesy-Thind S, Levine M. Clinical practice guidelines for the care and treatment of breast cancer: follow-up after treatment for breast cancer (summary of the 2005 update). CMAJ. 2005;172(10):2.	Nova Scotia and Ontario (2007 - December 31, 2013; 2007 - October 1, 2013; 2007 - March 31, 2015; 2007 - December 31, 2011)	
McCracken, 2017	*Therapeutics (Multiple medication results)*	Polypharmacy in older adults (Studies of Potentially Inappropriate Medications)	For the present study, ≥9 medications were chosen as the definition as one of the most robust studies done in Canada did the same, and our results will likely be most comparable to data also collected in this country. In Jokanovic et al's systematic review of prevalence, 24 studies used nine medications or greater as the cut-off versus 11 studies using five medications.	Jokanovic N, Tan EC, Dooley MJ, et al. Prevalence and factors associated with polypharmacy in long-term care facilities: a systematic review. J Am Med Dir Assoc 2015; 16:535.e1–535.e12.	Local health authority database (June 24, 2014 - November 2014)	Overuse (48.00%)
McDonald, 2011	Therapeutics (Psychosocial Therapy)	Counselling-Prenatal Care (weight gain, smoking, alcohol, working during pregnancy, medications in pregnancy, vitamins and minerals, exercise/active living, and/or	Guidelines recommend that women are counselled by a healthcare provider (HCP) on additional calorie intake during their pregnancy.	Institute of Medicine. Weight gain during pregnancy: reexamining the guidelines. Washington, DC: The National Academies Press; 2009. Health Canada. Canadian gestational weight gain recommendations. Health Canada [2009 [cited 2010 June 22]. Available at: http://www.hc-sc.gc.ca/fn-an/nutrition/prenatal/qagest-gros-qr-eng.php. Accessed Jan. 3, 2011.	N/A (June 2010-October 2010)	Underuse (82.10%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
		nutrition) (Prenatal)				
McDonald, 2011	Therapeutics (Psychosocial Therapy)	Counselling-Prenatal Care (weight gain, smoking, alcohol, working during pregnancy, medications in pregnancy, vitamins and minerals, exercise/active living, and/or nutrition) (Prenatal)	Guidelines recommend that women are counselled by a healthcare provider (HCP) on vitamin and mineral supplements during their pregnancy.	Institute of Medicine. Weight gain during pregnancy: reexamining the guidelines. Washington, DC: The National Academies Press; 2009. Health Canada. Canadian gestational weight gain recommendations. Health Canada [2009 [cited 2010 June 22]. Available at: http://www.hc-sc.gc.ca/fn-an/nutrition/prenatal/qagest-gros-qr-eng.php. Accessed Jan. 3, 2011.	N/A (June 2010-October 2010)	Underuse (3.20%)
McDonald, 2012	Therapeutics (Psychosocial Therapy)	Counselling-Prenatal Care (weight gain, smoking, alcohol, working during pregnancy, medications in pregnancy, vitamins and minerals, exercise/active living, and/or nutrition) (Prenatal)	Guidelines recommend that underweight women (BMI < 18.5 kg/m2) gain 12.5 to 18 kg (28 to 40 lbs), normal weight women (BMI 18.5 to 24.9 kg/m2) gain 11.5 to 16 kg (25 to 35 lbs), overweight women (BMI 25 to 29.9 kg/m2) gain 7 to 11.5 kg (15 to 25 lbs), and obese women (BMI ≥ 30 kg/m2) gain 5 to 9 kg (11 to 20 lbs).	Rasmussen KM, Yaktine AL, eds; Committee to Reexamine IOM Pregnancy Weight Guidelines; Institute of Medicine; National Research Council Institute of Medicine. Weight gain during pregnancy: reexamining the guidelines. Washington, DC: The National Academies Press; 2009. Health Canada. Canadian Gestational Weight Gain Recommendations. Ottawa: Health Canada; 20010. Available at: http://www.hc-sc.gc.ca/fn-an/nutrition/prenatal/qa-gest-gros-qr-eng.php. Accessed June 22, 2010.	N/A (June 2010-October 2010)	Underuse (89.60%)
McKenna, 2015	Therapeutics (Medications)	Antimicrobials (COPD)	Antibiotics are recommended for COPD patients with purulent exacerbations.	O'Donnell DE, Aaron S, Bourbeau J, et al. Canadian Thoracic Society recommendations for management of chronic obstructive pulmonary disease — 2007 update. Can Respir J 2007; 14:5B-32B.	Alberta Health Services (January 1, 2011-December 31, 2011)	Underuse (80.10%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
McKenna, 2015	Therapeutics (Biophysical Therapy)	Assisted Ventilation (COPD)	Assisted ventilation is recommended for patients with respiratory failure before intubation.	O'Donnell DE, Aaron S, Bourbeau J, et al. Canadian Thoracic Society recommendations for management of chronic obstructive pulmonary disease — 2007 update. Can Respir J 2007; 14:5B-32B.	Alberta Health Services (January 1, 2011-December 31, 2011)	Underuse (97.70%)
McKenna, 2015	Diagnostics (Multiple Blood Tests)	CBC, Electrolytes, Cardiac Enzymes (COPD)	Not provided in study; (from results, recommendation: CBC, electrolytes and cardiac enzyme blood tests should be taken from a patient being treated for COPD in Emergency Department).	O'Donnell DE, Aaron S, Bourbeau J, et al. Canadian Thoracic Society recommendations for management of chronic obstructive pulmonary disease — 2007 update. Can Respir J 2007; 14:5B-32B.	Alberta Health Services (January 1, 2011-December 31, 2011)	Underuse (54.90%)
McKenna, 2015	Therapeutics (Medications)	Corticosteroids-Drug Unknown (COPD)	Corticosteroids recommended for moderate to severe COPD exacerbations in ED and at discharge.	O'Donnell DE, Aaron S, Bourbeau J, et al. Canadian Thoracic Society recommendations for management of chronic obstructive pulmonary disease — 2007 update. Can Respir J 2007; 14:5B-32B.	Alberta Health Services (January 1, 2011-December 31, 2011)	Underuse (72.60%)
McKenna, 2015	Therapeutics (Medications)	Corticosteroids-Inhaled (COPD)	Not provided in study; (from results, recommendation: patients with COPD should be prescribed inhaled corticosteroids for management of an exacerbation in the Emergency Department).	O'Donnell DE, Aaron S, Bourbeau J, et al. Canadian Thoracic Society recommendations for management of chronic obstructive pulmonary disease — 2007 update. Can Respir J 2007; 14:5B-32B.	Alberta Health Services (January 1, 2011-December 31, 2011)	Underuse (57.00%)
McKenna, 2015	Diagnostics (Assessments)	Electrocardiogram (COPD)	Not provided in study; (from results, recommendation: patients being treated for COPD should receive an ECG test in the Emergency Department).	O'Donnell DE, Aaron S, Bourbeau J, et al. Canadian Thoracic Society recommendations for management of chronic obstructive pulmonary disease — 2007 update. Can Respir J 2007; 14:5B-32B.	Alberta Health Services (January 1, 2011-December 31, 2011)	Underuse (66.50%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
McKenna, 2015	Diagnostics (Imaging)	Radiography-Chest (COPD)	Chest radiography is recommended for all patients presenting to the Emergency Department with COPD.	O'Donnell DE, Aaron S, Bourbeau J, et al. Canadian Thoracic Society recommendations for management of chronic obstructive pulmonary disease — 2007 update. Can Respir J 2007; 14:5B-32B.	Alberta Health Services (January 1, 2011-December 31, 2011)	Underuse (35.00%)
McKenna, 2015	Therapeutics (Medications)	Short-acting Anticholinergics (COPD)	Inhaled SABA (short acting Beta-agonists)-Short-acting are recommended for COPD exacerbations; Long-acting are not recommended for COPD exacerbations.	O'Donnell DE, Aaron S, Bourbeau J, et al. Canadian Thoracic Society recommendations for management of chronic obstructive pulmonary disease — 2007 update. Can Respir J 2007; 14:5B-32B.	Alberta Health Services (January 1, 2011-December 31, 2011)	Underuse (51.10%)
McKenna, 2015	Diagnostics (Blood tests)	Blood cultures (COPD)	Not provided in study; (from results, recommendation: blood cultures should be taken from a patient being treated for COPD in the Emergency Department).	O'Donnell DE, Aaron S, Bourbeau J, et al. Canadian Thoracic Society recommendations for management of chronic obstructive pulmonary disease — 2007 update. Can Respir J 2007; 14:5B-32B.	Alberta Health Services (January 1, 2011-December 31, 2011)	Underuse (95.50%)
McKenna, 2015	Therapeutics (Medications)	Short-acting Beta-Agonists (SABA) (COPD)	Inhaled SABA (short acting Beta-agonists)-Short-acting recommended for COPD exacerbations; Long-acting not recommended for COPD exacerbations.	O'Donnell DE, Aaron S, Bourbeau J, et al. Canadian Thoracic Society recommendations for management of chronic obstructive pulmonary disease — 2007 update. Can Respir J 2007; 14:5B-32B.	Alberta Health Services (January 1, 2011-December 31, 2011)	Underuse (41.40%)
McKenna, 2015	Diagnostics (Laboratory tests (non-blood tests))	Sputum sample (COPD)	Collection of a sputum sample is recommended for patients with very poor lung function, with frequent exacerbations or who have been taking antibiotics in the preceding 3 months.	O'Donnell DE, Aaron S, Bourbeau J, et al. Canadian Thoracic Society recommendations for management of chronic obstructive pulmonary disease — 2007 update. Can Respir J 2007; 14:5B-32B.	Alberta Health Services (January 1, 2011-December 31, 2011)	Underuse (97.00%)
McKinnon, 2019	Therapeutics (Medications)	Antiemetic- Drug Unknown	Guidelines for pediatric oncology patients	Dupuis LL, Boodhan S, Sung L, et al. Guideline for classification of the acute emetogenic potential of	Alberta Children's	Underuse (71.00%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
		(Pediatric Oncology)	undergoing chemotherapy recommend certain antiemetics, dose and frequency for highly emetogenic chemotherapy (HEC) AND moderately emetogenic chemotherapy (MEC). HEC guideline recommendation for prophylaxis: 1. Aprepitant 125 mg PO ×1 on day 1 then 80 mg PO once daily × 2 days, if >/= to 12 years of age and 2. Dexamethasone 6 mg/m2/dose IV/PO q6h *if permitted, dose reduced if given with aprepitant and 3. Granisetron 40 mcg/kg/dose IV as a single daily dose OR ondansetron 5 mg/m2/dose (0.15 mg/kg/dose) IV/PO pretherapy × 1 and then q8h; MEC guideline recommendation for prophylaxis: 1. Dexamethasone if ≤0.6m2: 2 mg/dose IV/PO q12h, if >0.6m2: 4mg/dose IV/PO q12h *if permitted, dose reduced if given with aprepitant and 2. Granisetron 40	antineoplastic medication in pediatric cancer patients. Pediatr Blood Cancer. 2011; 57:191–198. Dupuis L, Boodhan S, Holdsworth M, et al. Guideline for the prevention of acute nausea and vomiting due to antineoplastic medication in pediatric cancer patients. Pediatr Blood Cancer. 2013; 60:1073–1082	Hospital; Stollery Children's Hospital; IWK Health Centre; Janeway Children's Health & Rehabilitation Centre (January 2012 - December 2015)	

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
			mcg/kg/dose IV as a single daily dose or ondansetron 5 mg/m2/dose (0.15 mg/kg/dose) IV/PO pretherapy × 1 and then q8h			
Minian, 2019	Diagnostics (Referrals)	Alcohol Dependence Resources (Alcohol Addiction)	Guidelines recommend women drink less than one alcoholic beverage and men less than two alcoholic beverages a day. Patients drinking above the guidelines should be provided with a brief alcohol reduction or abstinence intervention; and provided with a resource to stop drinking or reduce drinking.	Gulliver SB, Kamholz BW, Helstrom AW. Smoking cessation and alcohol abstinence: what do the data tell us? Alcohol Res. 2006;29(3):208. Baca CT, Yahne CE. Smoking cessation during substance abuse treatment: what you need to know. J Subst Abuse Treat. 2009;36(2):205–19. De P. The Canadian Cancer Society's perspective on alcohol and the evidence supporting it. Canadian Cancer Society. 2013.	STOP portal (April 2016-September 2017)	Underuse (55.00%)
Mohareb, 2015	Therapeutics (Acute care procedures)	Angiography (Ischemic Heart Disease)	In suspected stable IHD, coronary angiography is done to confirm or rule out the presence of obstructive coronary artery disease (CAD) such that appropriate secondary prevention medications can be initiated and the need for coronary revascularization can be assessed. Appropriateness categories and scores for angiography were based on Appropriate Use Criteria (AUC) for	Patel MR, Bailey SR, Bonow RO, Chambers CE, Chan PS, Dehmer GJ, et al. ACCF/SCAI/AATS/AHA/ASE/ASNC/HFSA/HRS/SCCM/SCCT/SCMR/STS 2012 appropriate use criteria for diagnostic catheterization: a report of the American College of Cardiology Foundation Appropriate Use Criteria Task Force, Society for Cardiovascular Angiography and Interventions, American Association for Thoracic Surgery, American Heart Association, American Society of Echocardiography, American Society of Nuclear Cardiology, Heart Failure Society of America, Heart Rhythm Society, Society of Critical Care Medicine, Society of Cardiovascular Computed Tomography, Society for Cardiovascular Magnetic Resonance, and Society of Thoracic Surgeons. J Am Coll Cardiol. 2012; 59:1995-2027. [PMID: 22578925] doi: 10.1016/j.jacc.2012.03.003 ('Appropriate use criteria	The Cardiac Care Network; Institute for Clinical Evaluative Sciences; The Canadian Institute for Health Information Discharge Abstract Database; Ontario Registered Persons Database; Statistics	Overuse (10.80%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
			diagnostic catheterization.	(AUC) for diagnostic catheterization', led by the American College of Cardiology)	Canada (October 1, 2008-Septermber 30, 2011)	
Morgan, 2016	*Therapeutics (Multiple medication results)*	Potentially Inappropriate Medications-medications not specified (Studies of Potentially Inappropriate Medications)	All prescriptions meeting the Beers Criteria based on drug, dosage and duration were identified as potentially inappropriate.	American Geriatrics Society Beers Criteria Update Expert Panel. American Geriatrics Society updated Beers Criteria for potentially inappropriate medication use in older adults. J Am Geriatr Soc 2012; 60:616-31. Drug use among seniors on public drug programs in Canada, 2012. Ottawa: Canadian Institute for Health Information; 2014.	National Prescription Drug Utilization Information System database (January 2013-December 2013)	Overuse (37.20%)
Morgen, 2015	Diagnostics (Blood tests)	Thyroid Stimulating Hormone (Diabetes mellitus)	TSH testing is recommended for patients taking thyroxine with a recent dose change should be tested after 8 to 12 weeks. Other clinical categories should be tested no more often than every 2 months; Should not be repeated within 8 weeks.	van Walraven C, Naylor C. Do we know what inappropriate laboratory utilization is? a systematic review of laboratory clinical audits. JAMA. 1998; 280:550-558. Zhi M, Ding EL, Theisen-Toupal J, et al. The landscape of inappropriate laboratory testing: a 15-year meta-analysis. PLoS One. 2013;8: e78962. Anderson TJ, Grégoire J, Hegele RA, et al. 2012 update of the Canadian Cardiovascular Society guidelines for the diagnosis and treatment of dyslipidemia for the prevention of cardiovascular disease in the adult. Can J Cardiol. 2013; 29:151-167. Canadian Diabetes Association Clinical Practice Guidelines Expert Committee, Cheng AYY. Canadian Diabetes Association 2013 clinical practice guidelines for the prevention and management of diabetes in Canada: introduction. Can J Diabetes. 2013;37(suppl 1): S1-S3. Alberta Health Services. Alberta Health Services Laboratory Bulletin—March 28, 2014. http://www.albertahealthservices.ca/LabServices/wf-	Information system of CalgaryLaboratory Services (2010)	Overuse (7.20%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				lab-bulletin-new-nemoglobin-a1c-testutilization-criteria.pdf. Accessed September 12, 2014. Towards Optimized Practice Program. Clinical practice guidelines: investigation and management of primary thyroid dysfunction. 2008. http://www.topalbertadoctors.org/download/350/thyroid_guideline.pdf. Accessed August 18, 2014. Smellie WSA, Wilson D, McNulty CAM, et al. Best practice in primary care pathology: review 1. J Clin Pathol. 2005; 58:1016-1024. Health Quality Ontario. Serum vitamin B12 testing: a rapid review. 2012. http://www.hqontario.ca/Portals/0/Documents/eds/rapid-reviews/vitamin-b12-121212-en.pdf. Accessed August 19, 2014. Moyer VA; U.S. Preventive Services Task Force. Vitamin D and calcium supplementation to prevent fractures in adults: U.S. Preventive Services Task Force recommendation statement. Ann Intern Med. 2013; 158:691-696. Nestle M, Nesheim MC. To supplement or not to supplement: the U.S. Preventive Services Task Force recommendations on calcium and vitamin D. Ann Intern Med. 2013; 158:701-702. Rizzoli R, Boonen S, Brandi M-L, et al. Vitamin D supplementation in elderly or postmenopausal women: a 2013 update of the 2008 recommendations from the European Society for Clinical and Economic Aspects of Osteoporosis and Osteoarthritis (ESCEO). Curr Med Res Opin. 2013; 29:305-313. Prentice RL, Pettinger MB, Jackson RD, et al. Health risks and benefits from calcium and vitamin D supplementation: Women's Health Initiative clinical trial and cohort study. Osteoporos Int. 2013; 24:567-580.		

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				Health Quality Ontario. Ferritin testing: a rapid review. 2012. http://www.hqontario.ca/Portals/0/Documents/eds/rapidreviews/ferritin-121212-en.pdf. Accessed August 19, 2014. Oh RC, Franzos T, Montoya C. Clinical inquiry: how best to diagnose iron-deficiency anemia in patients with inflammatory disease? J Fam Pract. 2012; 61:160-161. Bacon BR, Adams PC, Kowdley KV, et al. Diagnosis and management of hemochromatosis: 2011 practice guideline by the American Association for the Study of Liver Diseases. Hepatology. 2011; 54:328-343. Brittenham GM, Cohen AR, McLaren CE, et al. Hepatic iron stores and plasma ferritin concentration in patients with sickle cell anemia and thalassemia major. Am J Hematol. 1993; 42:81-85. Cappellini MD, Porter J, El-Beshlawy A, et al. Tailoring iron chelation by iron intake and serum ferritin: the prospective EPIC study of deferasirox in 1744 patients with transfusion dependent anemias. Haematologica. 2010; 95:557-566		
Morgen, 2015	Diagnostics (Blood tests)	Vitamin B12 (Not Specified)	This test has low diagnostic accuracy and is not indicated for routine screening, and there are no guidelines to support retesting a patient with a normal result or retesting a patient with an abnormal result unless noncompliance with therapy is suspected; No repeats <1 year.	van Walraven C, Naylor C. Do we know what inappropriate laboratory utilization is? a systematic review of laboratory clinical audits. JAMA. 1998; 280:550-558. Zhi M, Ding EL, Theisen-Toupal J, et al. The landscape of inappropriate laboratory testing: a 15-year meta-analysis. PLoS One. 2013;8: e78962. Anderson TJ, Grégoire J, Hegele RA, et al. 2012 update of the Canadian Cardiovascular Society guidelines for the diagnosis and treatment of dyslipidemia for the prevention of cardiovascular disease in the adult. Can J Cardiol. 2013; 29:151-167.	Information system of Calgary Laboratory Services (2010)	Overuse (28.40%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				Canadian Diabetes Association Clinical Practice Guidelines Expert Committee, Cheng AYY. Canadian Diabetes Association 2013 clinical practice guidelines for the prevention and management of diabetes in Canada: introduction. Can J Diabetes. 2013;37(suppl 1): S1-S3. Alberta Health Services. Alberta Health Services Laboratory Bulletin—March 28, 2014. http://www.albertahealthservices.ca/LabServices/wf-lab-bulletin-new-nemoglobin-a1c-testutilization-criteria.pdf. Accessed September 12, 2014. Towards Optimized Practice Program. Clinical practice guidelines: investigation and management of primary thyroid dysfunction. 2008. http://www.topalbertadoctors.org/download/350/thyroid_guideline.pdf. Accessed August 18, 2014. Smellie WSA, Wilson D, McNulty CAM, et al. Best practice in primary care pathology: review 1. J Clin Pathol. 2005; 58:1016-1024. Health Quality Ontario. Serum vitamin B12 testing: a rapid review. 2012. http://www.hqontario.ca/Portals/0/Documents/eds/rapid-reviews/vitamin-b12-121212-en.pdf. Accessed August 19, 2014. Moyer VA; U.S. Preventive Services Task Force. Vitamin D and calcium supplementation to prevent fractures in adults: U.S. Preventive Services Task Force recommendation statement. Ann Intern Med. 2013; 158:691-696. Nestle M, Nesheim MC. To supplement or not to supplement: the U.S. Preventive Services Task Force recommendations on calcium and vitamin D. Ann Intern Med. 2013; 158:701-702. Rizzoli R, Boonen S, Brandi M-L, et al. Vitamin D supplementation in elderly or postmenopausal		

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				women: a 2013 update of the 2008 recommendations from the European Society for Clinical and Economic Aspects of Osteoporosis and Osteoarthritis (ESCEO). Curr Med Res Opin. 2013; 29:305-313. Prentice RL, Pettinger MB, Jackson RD, et al. Health risks and benefits from calcium and vitamin D supplementation: Women's Health Initiative clinical trial and cohort study. Osteoporos Int. 2013; 24:567-580. Health Quality Ontario. Ferritin testing: a rapid review. 2012. http://www.hqontario.ca/Portals/0/Documents/eds/rapidreviews/ferritin-121212-en.pdf. Accessed August 19, 2014. Oh RC, Franzos T, Montoya C. Clinical inquiry: how best to diagnose iron-deficiency anemia in patients with inflammatory disease? J Fam Pract. 2012; 61:160-161. Bacon BR, Adams PC, Kowdley KV, et al. Diagnosis and management of hemochromatosis: 2011 practice guideline by the American Association for the Study of Liver Diseases. Hepatology. 2011; 54:328-343. Brittenham GM, Cohen AR, McLaren CE, et al. Hepatic iron stores and plasma ferritin concentration in patients with sickle cell anemia and thalassemia major. Am J Hematol. 1993; 42:81-85. Cappellini MD, Porter J, El-Beshlawy A, et al. Tailoring iron chelation by iron intake and serum ferritin: the prospective EPIC study of deferasirox in 1744 patients with transfusion dependent anemias. Haematologica. 2010; 95:557-566		
Morgen, 2015	Diagnostics (Blood tests)	Vitamin D (Not Specified)	The primary reason to repeat a normal test would be to monitor	van Walraven C, Naylor C. Do we know what inappropriate laboratory utilization is? a systematic	Information system of Calgary	Overuse (24.50%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
			supplementation to achieve higher levels of vitamin D, which is currently not recommended due to potential risks of renal calculi in the context of no demonstrated benefit for hip fracture or other potential benefits; No repeats of normal values <1 year.	review of laboratory clinical audits. JAMA. 1998; 280:550-558. Zhi M, Ding EL, Theisen-Toupal J, et al. The landscape of inappropriate laboratory testing: a 15-year meta-analysis. PLoS One. 2013;8: e78962. Anderson TJ, Grégoire J, Hegele RA, et al. 2012 update of the Canadian Cardiovascular Society guidelines for the diagnosis and treatment of dyslipidemia for the prevention of cardiovascular disease in the adult. Can J Cardiol. 2013; 29:151-167. Canadian Diabetes Association Clinical Practice Guidelines Expert Committee, Cheng AYY. Canadian Diabetes Association 2013 clinical practice guidelines for the prevention and management of diabetes in Canada: introduction. Can J Diabetes. 2013;37(suppl 1): S1-S3. Alberta Health Services. Alberta Health Services Laboratory Bulletin—March 28, 2014. http://www.albertahealthservices.ca/LabServices/wf-lab-bulletin-new-nemoglobin-a1c-testutilization-criteria.pdf. Accessed September 12, 2014. Towards Optimized Practice Program. Clinical practice guidelines: investigation and management of primary thyroid dysfunction. 2008. http://www.topalbertadoctors.org/download/350/thyroid_guideline.pdf. Accessed August 18, 2014. Smellie WSA, Wilson D, McNulty CAM, et al. Best practice in primary care pathology: review 1. J Clin Pathol. 2005; 58:1016-1024. Health Quality Ontario. Serum vitamin B12 testing: a rapid review. 2012. http://www.hqontario.ca/Portals/0/Documents/eds/rapid-reviews/vitamin-b12-121212-en.pdf. Accessed August 19, 2014.	Laboratory Services (2010)	

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				Moyer VA; U.S. Preventive Services Task Force. Vitamin D and calcium supplementation to prevent fractures in adults: U.S. Preventive Services Task Force recommendation statement. Ann Intern Med. 2013; 158:691-696. Nestle M, Nesheim MC. To supplement or not to supplement: the U.S. Preventive Services Task Force recommendations on calcium and vitamin D. Ann Intern Med. 2013; 158:701-702. Rizzoli R, Boonen S, Brandi M-L, et al. Vitamin D supplementation in elderly or postmenopausal women: a 2013 update of the 2008 recommendations from the European Society for Clinical and Economic Aspects of Osteoporosis and Osteoarthritis (ESCEO). Curr Med Res Opin. 2013; 29:305-313. Prentice RL, Pettinger MB, Jackson RD, et al. Health risks and benefits from calcium and vitamin D supplementation: Women's Health Initiative clinical trial and cohort study. Osteoporos Int. 2013; 24:567-580. Health Quality Ontario. Ferritin testing: a rapid review. 2012. http://www.hqontario.ca/Portals/0/Documents/eds/rapidreviews/ferritin-121212-en.pdf. Accessed August 19, 2014. Oh RC, Franzos T, Montoya C. Clinical inquiry: how best to diagnose iron-deficiency anemia in patients with inflammatory disease? J Fam Pract. 2012; 61:160-161. Bacon BR, Adams PC, Kowdley KV, et al. Diagnosis and management of hemochromatosis: 2011 practice guideline by the American Association for the Study of Liver Diseases. Hepatology. 2011; 54:328-343.		

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				Brittenham GM, Cohen AR, McLaren CE, et al. Hepatic iron stores and plasma ferritin concentration in patients with sickle cell anemia and thalassemia major. Am J Hematol. 1993; 42:81-85. Cappellini MD, Porter J, El-Beshlawy A, et al. Tailoring iron chelation by iron intake and serum ferritin: the prospective EPIC study of deferasirox in 1744 patients with transfusion dependent anemias. Haematologica. 2010; 95:557-566		
Morgen, 2015	Diagnostics (Blood tests)	Ferritin (Not Specified)	Ferritin is indicated for the diagnosis of iron deficiency or iron overload states. In both situations, a normal result essentially rules out the disease. It may be appropriate to monitor serum ferritin in the specific clinical situation of patients with transfusion-dependent anemia, but very few of these patients will have normal results; No repeats of normal values <1 year.	van Walraven C, Naylor C. Do we know what inappropriate laboratory utilization is? a systematic review of laboratory clinical audits. JAMA. 1998; 280:550-558. Zhi M, Ding EL, Theisen-Toupal J, et al. The landscape of inappropriate laboratory testing: a 15-year meta-analysis. PLoS One. 2013;8: e78962. Anderson TJ, Grégoire J, Hegele RA, et al. 2012 update of the Canadian Cardiovascular Society guidelines for the diagnosis and treatment of dyslipidemia for the prevention of cardiovascular disease in the adult. Can J Cardiol. 2013; 29:151-167. Canadian Diabetes Association Clinical Practice Guidelines Expert Committee, Cheng AYY. Canadian Diabetes Association 2013 clinical practice guidelines for the prevention and management of diabetes in Canada: introduction. Can J Diabetes. 2013;37(suppl 1): S1-S3. Alberta Health Services. Alberta Health Services Laboratory Bulletin—March 28, 2014. http://www.albertahealthservices.ca/LabServices/wf-lab-bulletin-new-nemoglobin-a1c-testutilization-criteria.pdf. Accessed September 12, 2014. Towards Optimized Practice Program. Clinical practice guidelines: investigation and management of	Information system of Calgary Laboratory Services (2010)	Overuse (35.80%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				primary thyroid dysfunction. 2008. http://www.topalbertadoctors.org/download/350/thyroid_guideline.pdf. Accessed August 18, 2014. Smellie WSA, Wilson D, McNulty CAM, et al. Best practice in primary care pathology: review 1. J Clin Pathol. 2005; 58:1016-1024. Health Quality Ontario. Serum vitamin B12 testing: a rapid review. 2012. http://www.hqontario.ca/Portals/0/Documents/eds/rapid-reviews/vitamin-b12-121212-en.pdf. Accessed August 19, 2014. Moyer VA; U.S. Preventive Services Task Force. Vitamin D and calcium supplementation to prevent fractures in adults: U.S. Preventive Services Task Force recommendation statement. Ann Intern Med. 2013; 158:691-696. Nestle M, Nesheim MC. To supplement or not to supplement: the U.S. Preventive Services Task Force recommendations on calcium and vitamin D. Ann Intern Med. 2013; 158:701-702. Rizzoli R, Boonen S, Brandi M-L, et al. Vitamin D supplementation in elderly or postmenopausal women: a 2013 update of the 2008 recommendations from the European Society for Clinical and Economic Aspects of Osteoporosis and Osteoarthritis (ESCEO). Curr Med Res Opin. 2013; 29:305-313. Prentice RL, Pettinger MB, Jackson RD, et al. Health risks and benefits from calcium and vitamin D supplementation: Women's Health Initiative clinical trial and cohort study. Osteoporos Int. 2013; 24:567-580. Health Quality Ontario. Ferritin testing: a rapid review. 2012. http://www.hqontario.ca/Portals/0/Documents/eds/rapidreviews/ferritin-121212-en.pdf. Accessed August 19, 2014.		

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				Oh RC, Franzos T, Montoya C. Clinical inquiry: how best to diagnose iron-deficiency anemia in patients with inflammatory disease? J Fam Pract. 2012; 61:160-161. Bacon BR, Adams PC, Kowdley KV, et al. Diagnosis and management of hemochromatosis: 2011 practice guideline by the American Association for the Study of Liver Diseases. Hepatology. 2011; 54:328-343. Brittenham GM, Cohen AR, McLaren CE, et al. Hepatic iron stores and plasma ferritin concentration in patients with sickle cell anemia and thalassemia major. Am J Hematol. 1993; 42:81-85. Cappellini MD, Porter J, El-Beshlawy A, et al. Tailoring iron chelation by iron intake and serum ferritin: the prospective EPIC study of deferasirox in 1744 patients with transfusion dependent anemias. Haematologica. 2010; 95:557-566		
Morgen, 2015	Diagnostics (Blood tests)	Glycated hemoglobin (HbA1c) (Diabetes mellitus)	HbA1c represents an average effect over several months, and it is not useful to test more frequently. Diabetic patients not meeting their glycemic goals (HbA1c generally 6%-7%) should be screened every 3 months. Those consistently meeting goals may be screened every 6 months. Patients without diabetes (HbA1c <6%) should be screened every 1 to 3 years, depending on risk profile; No repeats <3	van Walraven C, Naylor C. Do we know what inappropriate laboratory utilization is? a systematic review of laboratory clinical audits. JAMA. 1998; 280:550-558. Zhi M, Ding EL, Theisen-Toupal J, et al. The landscape of inappropriate laboratory testing: a 15-year meta-analysis. PLoS One. 2013;8: e78962. Anderson TJ, Grégoire J, Hegele RA, et al. 2012 update of the Canadian Cardiovascular Society guidelines for the diagnosis and treatment of dyslipidemia for the prevention of cardiovascular disease in the adult. Can J Cardiol. 2013; 29:151-167. Canadian Diabetes Association Clinical Practice Guidelines Expert Committee, Cheng AYY. Canadian Diabetes Association 2013 clinical practice guidelines for the prevention and management of	Information system of Calgary Laboratory Services (2010)	Overuse (28.10%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
			months (abnormal values) or <1 year (normal values).	diabetes in Canada: introduction. Can J Diabetes. 2013;37(suppl 1): S1-S3. Alberta Health Services. Alberta Health Services Laboratory Bulletin—March 28, 2014. http://www.albertahealthservices.ca/LabServices/wf-lab-bulletin-new-nemoglobin-a1c-testutilization-criteria.pdf. Accessed September 12, 2014. Towards Optimized Practice Program. Clinical practice guidelines: investigation and management of primary thyroid dysfunction. 2008. http://www.topalbertadoctors.org/download/350/thyroid_guideline.pdf. Accessed August 18, 2014. Smellie WSA, Wilson D, McNulty CAM, et al. Best practice in primary care pathology: review 1. J Clin Pathol. 2005; 58:1016-1024. Health Quality Ontario. Serum vitamin B12 testing: a rapid review. 2012. http://www.hqontario.ca/Portals/0/Documents/eds/rapid-reviews/vitamin-b12-121212-en.pdf. Accessed August 19, 2014. Moyer VA; U.S. Preventive Services Task Force. Vitamin D and calcium supplementation to prevent fractures in adults: U.S. Preventive Services Task Force recommendation statement. Ann Intern Med. 2013; 158:691-696. Nestle M, Nesheim MC. To supplement or not to supplement: the U.S. Preventive Services Task Force recommendations on calcium and vitamin D. Ann Intern Med. 2013; 158:701-702. Rizzoli R, Boonen S, Brandi M-L, et al. Vitamin D supplementation in elderly or postmenopausal women: a 2013 update of the 2008 recommendations from the European Society for Clinical and Economic Aspects of Osteoporosis and Osteoarthritis (ESCEO). Curr Med Res Opin. 2013; 29:305-313.		

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				Prentice RL, Pettinger MB, Jackson RD, et al. Health risks and benefits from calcium and vitamin D supplementation: Women's Health Initiative clinical trial and cohort study. Osteoporos Int. 2013; 24:567-580. Health Quality Ontario. Ferritin testing: a rapid review. 2012. http://www.hqontario.ca/Portals/0/Documents/eds/rapidreviews/ferritin-121212-en.pdf. Accessed August 19, 2014. Oh RC, Franzos T, Montoya C. Clinical inquiry: how best to diagnose iron-deficiency anemia in patients with inflammatory disease? J Fam Pract. 2012; 61:160-161. Bacon BR, Adams PC, Kowdley KV, et al. Diagnosis and management of hemochromatosis: 2011 practice guideline by the American Association for the Study of Liver Diseases. Hepatology. 2011; 54:328-343. Brittenham GM, Cohen AR, McLaren CE, et al. Hepatic iron stores and plasma ferritin concentration in patients with sickle cell anemia and thalassemia major. Am J Hematol. 1993; 42:81-85. Cappellini MD, Porter J, El-Beshlawy A, et al. Tailoring iron chelation by iron intake and serum ferritin: the prospective EPIC study of deferasirox in 1744 patients with transfusion dependent anemias. Haematologica. 2010; 95:557-566		
Morgen, 2015	Diagnostics (Blood tests)	Lipid profile (Not Specified)	Serum cholesterol changes slowly, and repeat testing is not useful before the interval specified. Exception: A lipid panel might reasonably be repeated at 1 month in	van Walraven C, Naylor C. Do we know what inappropriate laboratory utilization is? a systematic review of laboratory clinical audits. JAMA. 1998; 280:550-558. Zhi M, Ding EL, Theisen-Toupal J, et al. The landscape of inappropriate laboratory testing: a 15-year meta-analysis. PLoS One. 2013;8: e78962.	Information system of Calgary Laboratory Services (2010)	Overuse (10.50%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
			patients undergoing treatment intensification; No repeats <12 weeks.	Anderson TJ, Grégoire J, Hegele RA, et al. 2012 update of the Canadian Cardiovascular Society guidelines for the diagnosis and treatment of dyslipidemia for the prevention of cardiovascular disease in the adult. Can J Cardiol. 2013; 29:151-167. Canadian Diabetes Association Clinical Practice Guidelines Expert Committee, Cheng AYY. Canadian Diabetes Association 2013 clinical practice guidelines for the prevention and management of diabetes in Canada: introduction. Can J Diabetes. 2013;37(suppl 1): S1-S3. Alberta Health Services. Alberta Health Services Laboratory Bulletin—March 28, 2014. http://www.albertahealthservices.ca/LabServices/wf-lab-bulletin-new-nemoglobin-a1c-testutilization-criteria.pdf. Accessed September 12, 2014. Towards Optimized Practice Program. Clinical practice guidelines: investigation and management of primary thyroid dysfunction. 2008. http://www.topalbertadoctors.org/download/350/thyroid_guideline.pdf. Accessed August 18, 2014. Smellie WSA, Wilson D, McNulty CAM, et al. Best practice in primary care pathology: review 1. J Clin Pathol. 2005; 58:1016-1024. Health Quality Ontario. Serum vitamin B12 testing: a rapid review. 2012. http://www.hqontario.ca/Portals/0/Documents/eds/rapid-reviews/vitamin-b12-121212-en.pdf. Accessed August 19, 2014. Moyer VA; U.S. Preventive Services Task Force. Vitamin D and calcium supplementation to prevent fractures in adults: U.S. Preventive Services Task Force recommendation statement. Ann Intern Med. 2013; 158:691-696.		

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				Nestle M, Nesheim MC. To supplement or not to supplement: the U.S. Preventive Services Task Force recommendations on calcium and vitamin D. Ann Intern Med. 2013; 158:701-702. Rizzoli R, Boonen S, Brandi M-L, et al. Vitamin D supplementation in elderly or postmenopausal women: a 2013 update of the 2008 recommendations from the European Society for Clinical and Economic Aspects of Osteoporosis and Osteoarthritis (ESCEO). Curr Med Res Opin. 2013; 29:305-313. Prentice RL, Pettinger MB, Jackson RD, et al. Health risks and benefits from calcium and vitamin D supplementation: Women's Health Initiative clinical trial and cohort study. Osteoporos Int. 2013; 24:567-580. Health Quality Ontario. Ferritin testing: a rapid review. 2012. http://www.hqontario.ca/Portals/0/Documents/eds/rapidreviews/ferritin-121212-en.pdf. Accessed August 19, 2014. Oh RC, Franzos T, Montoya C. Clinical inquiry: how best to diagnose iron-deficiency anemia in patients with inflammatory disease? J Fam Pract. 2012; 61:160-161. Bacon BR, Adams PC, Kowdley KV, et al. Diagnosis and management of hemochromatosis: 2011 practice guideline by the American Association for the Study of Liver Diseases. Hepatology. 2011; 54:328-343. Brittenham GM, Cohen AR, McLaren CE, et al. Hepatic iron stores and plasma ferritin concentration in patients with sickle cell anemia and thalassemia major. Am J Hematol. 1993; 42:81-85. Cappellini MD, Porter J, El-Beshlawy A, et al. Tailoring iron chelation by iron intake and serum		

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				ferritin: the prospective EPIC study of deferasirox in 1744 patients with transfusion dependent anemias. Haematologica. 2010; 95:557-566		
Olson, 2014	Therapeutics (Biophysical Therapy)	Radiation Therapy (Bone Cancer)	A single fraction (SF) of Radiation Therapy (RT) provides pain control equivalent to that with a more prolonged course of multiple fractions (MF) in the setting of painful bone metastases. In addition, MFRT courses are less convenient for patients, produce more acute toxicity, and are more costly to patients and the health care system.	Chow E, Zeng L, Salvo N, et al. Update on the systematic review of palliative radiotherapy trials for bone metastases. Clin Oncol 2012; 24:112-124. Wu JS, Wong R, Johnston M, et al., Cancer Care Ontario Practice Guidelines Initiative Supportive Care Group. Metaanalysis of dose-fractionation radiotherapy trials for the palliation of painful bone metastases. Int J Radiat Oncol Biol Phys 2003; 55:594-605. Wu JS, Wong RK, Lloyd NS, et al. Radiotherapy fractionation for the palliation of uncomplicated painful bone metastases an evidence-based practice guideline. BMC Cancer 2004; 4:71.	British Columbia Cancer Agency Radiation Therapy database and Cancer Agency Information System (2007 - 2011)	Underuse (50.80%)
Pai, 2013	Therapeutics (Medications)	Venous Thromboembolism Prophylaxis (Cancer)	VTE prophylaxis should be ordered for patients with at least one of the following risk factors: 1) congestive heart failure; 2) severe respiratory disease (e.g., COPD or ILD); 3) immobility (i.e. confined to bed or needs assistance to ambulate) plus one or more of the following risk factors: acute ischemic stroke, active cancer or malignancy-associated disease, sepsis (e.g., severe pneumonia), acute neurologic disease (e.g., demyelinating disease),	Geerts WH, Bergqvist D, Pineo GF, et al: Prevention of venous thromboembolism: American College of Chest Physicians Evidence Based Clinical Practice Guidelines (8th Edition). Chest 2008, 133:381S–453S.	Not specified (January 2009-April 2009)	Underuse (33.00%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
			inflammatory bowel disease, prior venous thromboembolism or thrombophilia.			
Panju, 2011	Therapeutics (Medications)	Venous Thromboembolism Prophylaxis (Cancer)	Not provided in study; (from results, recommendation: patients should receive pharmacological VTE prophylaxis within 24 hours of admission to hospital).	Geerts WH, Bergquist D, Pineo GF et al. Prevention of venous thromboembolism: American College of Chest Physicians evidence-based clinical practice guidelines (8th Edition). Chest 2008; 133:381S–453S. http://dx.doi.org/10.1378/chest.08-0656	McMaster University Hospital; Hamilton General Hospital (January 1, 2007-July 1, 2007)	Underuse (46.50%)
Papastergiou, 2019	*Therapeutics (Multiple medication results)*	Potentially Inappropriate Medications-medications not specified (Studies of Potentially Inappropriate Medications)	In accordance with BEERs criteria, specific medications should not be prescribed to older adults; and may result in poor patient outcomes, including increase adverse drug reactions, hospitalizations and mortality.	Holland R, Desborough J, Goodyer L, Hall S, Wright D, Loke YK. Does pharmacist-led medication review help to reduce hospital admissions and deaths in older people? A systematic review and meta-analysis. Br J Clin Pharmacol 2008;65(3):303-16. Lenaghan E, Holland R, Brooks A. Home-based medication review in a high risk elderly population in primary care—the POLYMED randomised controlled trial. Age Ageing 2007;36(3):292-7. American Geriatrics Society 2015 Beers Criteria Update Expert Panel. American Geriatrics Society 2015 updated Beers criteria for potentially inappropriate medication use in older adults. J Am Geriatr Soc 2015;63(11):2227-46. Penninkilampi R, Eslick GD. A systematic review and meta-analysis of the risk of dementia associated with benzodiazepine use, after controlling for protopathic bias. CNS Drugs 2018;32(6):485-97.	Home visits (January 2016-March 2017)	Overuse (36.80%)
Pardhan, 2019	Diagnostics (Imaging)	Carotid Imaging/Doppler (CVD)	Carotid imaging is recommended to determine whether carotid stenosis (narrowing of certain	Heart & Stroke Foundation. Canadian Stroke Best Practices Stroke Quality Advisory Committee. Quality of Stroke Care in Canada. Update 2016 Final (R12). Accessed April 15, 2019 at https://www.strokebestpractices.ca/-/media/1-	Institute for Clinical Evaluative Sciences (2017-2018)	Underuse (15.60%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
			blood vessels in the neck) is present.	strokebestpractices/quality/english/2016strokekeyindicators.ashx		
Pasricha, 2018	Therapeutics (Medications)	Opioids-medication(s) not specified (Dental Pain)	Recommendations do not recommend an initial opioid dose to exceed 50 MME.	Busse JW, Craigie S, Juurlink DN, Buckley DN, Wang L, Couban RJ, Agoritsas T, Akl EA, Carrasco-Labra A, Cooper L, Cull C, da Costa BR, Frank JW, Grant G, Iorio A, Persaud N, Stern S, Tugwell P, Vandvik PO, Guyatt GH. Guideline for opioid therapy and chronic noncancer pain. CMAJ 2017;189: E659–66. Dowell D, Haegerich TM, Chou R. CDC guideline for prescribing opioids for chronic pain—United States, 2016. MMWR Recomm Rep 2016;65: 1–49.	Narcotics Monitoring System; Ontario Cancer Registry; Activity Level Reporting database; Canadian Institute for Health Information's Discharge Abstract Database; Canadian Institute for Health Information's National Ambulatory Care Reporting System; Ontario Health Insurance Plan Claims History Database; Ontario Health Insurance Plan Registered Persons Database (April 1, 2015	Overuse (23.90%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
					- March 31, 2016)	
Pasricha, 2018	Therapeutics (Medications)	Opioids-medication(s) not specified (Dental Pain)	Recommendations do not recommend an opioid prescription to exceed a 7 days' supply.	Busse JW, Craigie S, Juurlink DN, Buckley DN, Wang L, Couban RJ, Agoritsas T, Akl EA, Carrasco-Labra A, Cooper L, Cull C, da Costa BR, Frank JW, Grant G, Iorio A, Persaud N, Stern S, Tugwell P, Vandvik PO, Guyatt GH. Guideline for opioid therapy and chronic noncancer pain. CMAJ 2017;189: E659–66. Dowell D, Haegerich TM, Chou R. CDC guideline for prescribing opioids for chronic pain—United States, 2016. MMWR Recomm Rep 2016;65: 1–49.	Narcotics Monitoring System; Ontario Cancer Registry; Activity Level Reporting database; Canadian Institute for Health Information's Discharge Abstract Database; Canadian Institute for Health Information's National Ambulatory Care Reporting System; Ontario Health Insurance Plan Claims History Database; Ontario Health Insurance Plan Registered Persons Database (April 1, 2015	Overuse (17.40%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
					- March 31, 2016)	
Pelletier, 2016	Diagnostics (Screening)	Mammography (Breast Cancer (Screening))	Guideline recommends that women with an abnormal screening mammogram receive a follow-up examination approximately 6 months later. The authors of this study define a short-interval follow-up recommendation as a follow-up between 4 and 11 months made after imaging assessment of an abnormal screen.	Investigation of lesions detected by mammography. The Steering Committee on Clinical Practice Guidelines for the Care and Treatment of Breast Cancer. Canadian Association of Radiation Oncologists. CMAJ 1998;158: S9e14.	Breast Imaging Reporting and Data System (January 1, 2007 - December 31, 2008)	Underuse (73.10%)
Pendrith, 2017	Diagnostics (Imaging)	Computed Tomography or Magnetic Resonance Imaging-Lower Spine (Lower Back Pain)	Guidelines do not recommend imaging for lower back pain unless red flags are present.	Choosing Wisely Canada family medicine: eleven things physicians and patients should question. Ottawa: Canadian Medical Association/Toronto: University of Toronto; 2014. Available: www.choosingwiselycanada.org/recommendations/family medicine/ (accessed 2015 Feb. 6). American Academy of Familty Physicians. Fifteen things physicians and patients should question. In: Choosing Wisely: an initiative of the ABIM Foundation. Philadelphia: ABIM Foundation; 2013. Available: www.choosingwisely.org/ societies/american-academy-of-family-physicians/ (ac cessed 2015 Nov. 23). Choosing Wisely Canada radiology: five things physicians and patients should question. Ottawa: Canadian Medical Association/Toronto: University of Toronto; 2014. Available: www.choosingwiselycanada.org/recommendations/radiology/ (accessed 2015 Feb. 6). Choosing Wisely Canada pathology: five things physicians and patients should question. Ottawa:	Institute for Clinical Evaluative Sciences; Registered Persons Database; Ontario Health Insurance Plan (April 1, 2008 - March 31, 2013)	Overuse (4.50%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				Canadian Medical Association/Toronto: University of Toronto; 2014; Available: www.choosingwiselycanada.org/recommendations/ pathology/ (accessed 2015 Feb. 6). American College of Rheumatology. Five things physicians and patients should question. In: Choosing Wisely: an initiative of the ABIM Foundation. Table Philadelphia: ABIM Foundation; 2013. Available: www.choosingwisely.org/ societies/ american-college-of-rheumatology/ (accessed 2015 Nov. 23). Chow SL, Carter Thorne J, Bell MJ, et al.; Canadian Rheumatology Association Choosing Wisely Committee. Choosing wisely: the Canadian Rheumatology Association's list of 5 Items physicians and patients should question. J Rheumatol 2015; 42:682-9. Iron K, Jaakimainen L, Rothwell D, et al. Investigation of acute lower back pain in Ontario: are guidelines being followed? Toronto: Institute for Clinical Evaluative (ICES); 2004. Jaglal S, Hawker G, Croxford R, et al. Impact of a change in physician reimbursement on bone mineral density testing in Ontario, Canada: a population-based study. CMAJ Open 2014;2: E45-50. Lofters AK, Moineddin R, Hwang SW, et al. Low rates of cervical cancer screening among urban immigrants: a population-based study in Ontario, Canada. Med Care 2010; 48:611-8. Colla CH, Morden NE, Sequist TD; et al. Choosing wisely: prevalence and correlates of low-value health care services in the United States. J Gen Intern Med 2015; 30:221-8.		

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				Schwartz AL, Landon BE, Elshaug AG, et al. Measuring low-value care in Medicare. JAMA Intern Med 2014; 174:1067-76. Allin S, Munce S, Jaglal S, et al. Capture of osteoporosis and fracture information in an electronic medical record database from primary care. AMIA Annu Symp Proc 2014; 2014:240-8. Rosenberg A, Agiro A. Gottlieb Met al. Early trends among seven recommendations from the Choosing Wisely campaign. JAMA Intern Med 2015; 175:1913-20. Murphy J, Kennedy EB, Dunn S, et al. Ontario Cervical Screening Program; Program in Evidence-based Care. Cervical screening: a guideline for clinical practice in Ontario. J Obstet Gynaecol Can 2012; 34:453-8 Provincial strategy for x-ray computed tomography (CT) and/or magnetic resonance imaging (MRI) for low back pain. INFOBulletin No 4569. North York (ON): Ontario Ministry of Health and Long-Term Care; 2012. Available: www.health.gov.on.ca/en/pro/programs/ohip/bulletins/4000/ bul4569.pdf (accessed 2015 Nov. 23).		
Pendrith, 2017	Diagnostics (Imaging)	Dual X-ray Absorptiometry (DEXA) Scan (Osteoporosis)	Guidelines do not recommend that DEXA scans are repeated more than every 2 years.	Choosing Wisely Canada family medicine: eleven things physicians and patients should question. Ottawa: Canadian Medical Association/Toronto: University of Toronto; 2014. Available: www.choosingwiselycanada.org/recommendations/family medicine/ (accessed 2015 Feb. 6). American Academy of Familty Physicians. Fifteen things physicians and patients should question. In: Choosing Wisely: an initiative of the ABIM Foundation. Philadelphia: ABIM Foundation; 2013. Available: www.choosingwisely.org/	Institute for Clinical Evaluative Sciences; Registered Persons Database; Ontario Health Insurance Plan (April 1, 2008 - March 31, 2013)	Overuse (21.00%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				societies/american-academy-of-family-physicians/ (ac cessed 2015 Nov. 23). Choosing Wisely Canada radiology: five things physicians and patients should question. Ottawa: Canadian Medical Association/Toronto: University of Toronto; 2014. Available: www.choosingwiselycanada.org/recommendations/radiology/ (accessed 2015 Feb. 6). Choosing Wisely Canada pathology: five things physicians and patients should question. Ottawa: Canadian Medical Association/Toronto: University of Toronto; 2014; Available: www.choosingwiselycanada.org/recommendations/pathology/ (accessed 2015 Feb. 6). American College of Rheumatology. Five things physicians and patients should question. In: Choosing Wisely: an initiative of the ABIM Foundation. Table Philadelphia: ABIM Foundation; 2013. Available: www.choosingwisely.org/ societies/ american-college-of-rheumatology/ (accessed 2015 Nov. 23). Chow SL, Carter Thorne J, Bell MJ, et al.; Canadian Rheumatology Association Choosing Wisely Committee. Choosing wisely: the Canadian Rheumatology Association's list of 5 Items physicians and patients should question. J Rheumatol 2015; 42:682-9. Iron K, Jaakimainen L, Rothwell D, et al. Investigation of acute lower back pain in Ontario: are guidelines being followed? Toronto: Institute for Clinical Evaluative (ICES); 2004. Jaglal S, Hawker G, Croxford R, et al. Impact of a change in physician reimbursement on bone mineral density testing in Ontario, Canada: a population-based study. CMAJ Open 2014;2: E45-50.		

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				Lofters AK, Moineddin R, Hwang SW, et al. Low rates of cervical cancer screening among urban immigrants: a population-based study in Ontario, Canada. Med Care 2010; 48:611-8. Colla CH, Morden NE, Sequist TD; et al. Choosing wisely: prevalence and correlates of low-value health care services in the United States. J Gen Intern Med 2015; 30:221-8. Schwartz AL, Landon BE, Elshaug AG, et al. Measuring low-value care in Medicare. JAMA Intern Med 2014; 174:1067-76. Allin S, Munce S, Jaglal S, et al. Capture of osteoporosis and fracture information in an electronic medical record database from primary care. AMIA Annu Symp Proc 2014; 2014:240-8. Rosenberg A, Agiro A. Gottlieb Met al. Early trends among seven recommendations from the Choosing Wisely campaign. JAMA Intern Med 2015; 175:1913-20. Murphy J, Kennedy EB, Dunn S, et al. Ontario Cervical Screening Program; Program in Evidence-based Care. Cervical screening: a guideline for clinical practice in Ontario. J Obstet Gynaecol Can 2012; 34:453-8 Provincial strategy for x-ray computed tomography (CT) and/or magnetic resonance imaging (MRI) for low back pain. INFOBulletin No 4569. North York (ON): Ontario Ministry of Health and Long-Term Care; 2012. Available: www.health.gov.on.ca/en/pro/programs/ohip/bulletins/4000/ bul4569.pdf (accessed 2015 Nov. 23).		
Pendrith, 2017	Diagnostics (Screening)	Papanicolaou (Pap) test	Guidelines do not recommend screening women with	Choosing Wisely Canada family medicine: eleven things physicians and patients should question. Ottawa: Canadian Medical Association/Toronto:	Institute for Clinical Evaluative	Overuse (8.00%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
		(Cervical Cancer (Screening))	Papanicolaou tests if they are under 21 years of age or over 69 years of age.	University of Toronto; 2014. Available: www.choosingwiselycanada.org/recommendations/family medicine/ (accessed 2015 Feb. 6). American Academy of Familty Physicians. Fifteen things physicians and patients should question. In: Choosing Wisely: an initiative of the ABIM Foundation. Philadelphia: ABIM Foundation; 2013. Available: www.choosingwisely.org/ societies/american-academy-of-family-physicians/ (ac cessed 2015 Nov. 23). Choosing Wisely Canada radiology: five things physicians and patients should question. Ottawa: Canadian Medical Association/Toronto: University of Toronto; 2014. Available: www.choosingwiselycanada.org/recommendations/radiology/ (accessed 2015 Feb. 6). Choosing Wisely Canada pathology: five things physicians and patients should question. Ottawa: Canadian Medical Association/Toronto: University of Toronto; 2014; Available: www.choosingwiselycanada.org/recommendations/ pathology/ (accessed 2015 Feb. 6). American College of Rheumatology. Five things physicians and patients should question. In: Choosing Wisely: an initiative of the ABIM Foundation. Table Philadelphia: ABIM Foundation; 2013. Available: www.choosingwisely.org/ societies/ american-college-of-rheumatology/ (accessed 2015 Nov. 23). Chow SL, Carter Thorne J, Bell MJ, et al.; Canadian Rheumatology Association Choosing Wisely Committee. Choosing wisely: the Canadian Rheumatology Association's list of 5 Items physicians and patients should question. J Rheumatol 2015; 42:682-9.	Sciences; Registered Persons Database; Ontario Health Insurance Plan (April 1, 2008 - March 31, 2013)	

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				Iron K, Jaakimainen L, Rothwell D, et al. Investigation of acute lower back pain in Ontario: are guidelines being followed? Toronto: Institute for Clinical Evaluative (ICES); 2004. Jaglal S, Hawker G, Croxford R, et al. Impact of a change in physician reimbursement on bone mineral density testing in Ontario, Canada: a population-based study. CMAJ Open 2014;2: E45-50. Lofters AK, Moineddin R, Hwang SW, et al. Low rates of cervical cancer screening among urban immigrants: a population-based study in Ontario, Canada. Med Care 2010; 48:611-8. Colla CH, Morden NE, Sequist TD; et al. Choosing wisely: prevalence and correlates of low-value health care services in the United States. J Gen Intern Med 2015; 30:221-8. Schwartz AL, Landon BE, Elshaug AG, et al. Measuring low-value care in Medicare. JAMA Intern Med 2014; 174:1067-76. Allin S, Munce S, Jaglal S, et al. Capture of osteoporosis and fracture information in an electronic medical record database from primary care. AMIA Annu Symp Proc 2014; 2014:240-8. Rosenberg A, Agiro A. Gottlieb Met al. Early trends among seven recommendations from the Choosing Wisely campaign. JAMA Intern Med 2015; 175:1913-20. Murphy J, Kennedy EB, Dunn S, et al. Ontario Cervical Screening Program; Program in Evidence-based Care. Cervical screening: a guideline for clinical practice in Ontario. J Obstet Gynaecol Can 2012; 34:453-8		

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				Provincial strategy for x-ray computed tomography (CT) and/or magnetic resonance imaging (MRI) for low back pain. INFOBulletin No 4569. North York (ON): Ontario Ministry of Health and Long-Term Care; 2012. Available: www.health.gov.on.ca/en/pro/programs/ohip/bulletins/4000/ bul4569.pdf (accessed 2015 Nov. 23).		
Plitt, 2016	Diagnostics (Screening)	Syphilis (Prenatal)	Recommended that pregnant women receive 3 prenatal screening tests (PSTs) during their first trimester, mid-gestation and at delivery.	Public Health Agency of Canada. Canadian Guidelines on Sexually Transmitted Infections, 2013 ed. Ottawa, ON: Her Majesty the Queen in Right of Canada, 2013. Available at: http://www.phac-aspc.gc.ca/std-mts/sti-its/cgsti-ldcits/index-eng.php (Accessed December 10, 2014).	Alberta Vital Statistics Registry; Alberta Health Care Insurance Plan, Notice of Birth, Supplemental Enhanced Service Event Physician Claims, and the Alberta Provincial Laboratory for Public Health (January 1, 2010-December 31, 2011)	Underuse (79.30%)
Price, 2019	Diagnostics (Assessments)	Asthma Control (Asthma)	Guidelines recommend that asthma control should be assessed at each visit.	Lougheed MD, Lemière C, Dell SD, et al. Canadian Thoracic Society Asthma Management Continuum--2010 Consensus Summary for children six years of age and over, and adults. Can Respir J 2010; 17:15–24. British Thoracic Society, Scottish Intercollegiate Guidelines Network. British guideline on the management of asthma: a national clinical guideline. 2016 https://www. brit- thoracic. org. uk/ document-library/ clinical- information/ asthma/ btssign-asthma- guideline- 2016/ (Cited Feb 2018).	Not specified (August 2012 - July 31, 2013)	Underuse (95.00%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				Ernst P, Fitzgerald JM, Spier S. Canadian asthma consensus conference summary of recommendations. Can Respir J 1996; 3:89–101. British Thoracic Society Scottish Intercollegiate Guidelines Network. British guideline on the management of asthma. Thorax 2003;58(Suppl 1): i1–94. British Thoracic Society, Research Unit of the Royal College of Physicians of London, King's Fund Centre, National Asthma Campaign. Guidelines for management of asthma in adults: I--Chronic persistent asthma. Statement by the British Thoracic Society, Research Unit of the Royal College of Physicians of London, King' s Fund Centre, National Asthma Campaign. BMJ 1990; 301:651–3. Lemière C, Bai T, Balter M, et al. Adult asthma consensus guidelines update 2003. Can Respir J 2004; 11:9A–18. National Institute for Health and Care Excellence (NICE). Asthma: diagnosis, monitoring and chronic asthma management. London: NICE, 2017.		
Price, 2019	Diagnostics (Assessments)	Asthma Control (Asthma)	Guideline recommends that a written asthma action plan (AAP) (i.e., an individualised self-management plan) is produced by a health-care professional for a patient with asthma.	Lougheed MD, Lemière C, Dell SD, et al. Canadian Thoracic Society Asthma Management Continuum--2010 Consensus Summary for children six years of age and over, and adults. Can Respir J 2010; 17:15–24. British Thoracic Society, Scottish Intercollegiate Guidelines Network. British guideline on the management of asthma: a national clinical guideline. 2016 https://www. brit- thoracic. org. uk/ document-library/ clinical- information/ asthma/ btssign-asthma- guideline- 2016/ (Cited Feb 2018).	Not specified (August 2012 - July 31, 2013)	Underuse (100.00%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				Ernst P, Fitzgerald JM, Spier S. Canadian asthma consensus conference summary of recommendations. Can Respir J 1996; 3:89–101. British Thoracic Society Scottish Intercollegiate Guidelines Network. British guideline on the management of asthma. Thorax 2003;58(Suppl 1): i1–94. British Thoracic Society, Research Unit of the Royal College of Physicians of London, King's Fund Centre, National Asthma Campaign. Guidelines for management of asthma in adults: I--Chronic persistent asthma. Statement by the British Thoracic Society, Research Unit of the Royal College of Physicians of London, King' s Fund Centre, National Asthma Campaign. BMJ 1990; 301:651–3. Lemière C, Bai T, Balter M, et al. Adult asthma consensus guidelines update 2003. Can Respir J 2004; 11:9A–18. National Institute for Health and Care Excellence (NICE). Asthma: diagnosis, monitoring and chronic asthma management. London: NICE, 2017.		
Redwood, 2019	Therapeutics (Biophysical Therapy)	Enhanced Recovery After Surgery (ERAS Bundle) (Breast Reconstruction Surgery)	Recommended that patients undergoing alloplastic breast reconstruction surgery receive Enhanced Recovery after Surgery (ERAS) recommendations, including: preoperative patient education and counseling, reduced preoperative fasting, prophylactic antiemetic treatment, early postoperative feeding,	Temple-Oberle C, Shea-Budgell MA, Tan M, et al; ERAS Society. Consensus review of optimal perioperative care in breast reconstruction: Enhanced Recovery after Surgery (ERAS) Society recommendations. Plast Reconstr Surg. 2017; 139:1056e–1071e.	Synoptec (August 2015 - April 2018)	Underuse (47.00%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
			and multimodal pain management.			
Redwood, 2019	Therapeutics (Biophysical Therapy)	Enhanced Recovery After Surgery (ERAS Bundle) (Breast Reconstruction Surgery)	Recommended that patients undergoing autogenous breast reconstruction surgery receive Enhanced Recovery after Surgery (ERAS) recommendations, including: preoperative patient education and counseling, reduced preoperative fasting, prophylactic antiemetic treatment, early postoperative feeding, and multimodal pain management.	Temple-Oberle C, Shea-Budgell MA, Tan M, et al; ERAS Society. Consensus review of optimal perioperative care in breast reconstruction: Enhanced Recovery after Surgery (ERAS) Society recommendations. Plast Reconstr Surg. 2017; 139:1056e–1071e.	Synoptec (August 2015 - April 2018)	Underuse (28.00%)
Remfry, 2015	*Diagnostics (Multiple imaging results)*	Cardiac Imaging (Transthoracic Echocardiography Transesophageal Echocardiography, Single-photon Emission Tomography Myocardial Perfusion Imaging, Diagnostic Cardiac Catheterization) (Suspected CVD)	Not explicitly stated in study, but authors classified appropriateness of TTEs, TEEs, SPECTs and diagnostic catheterizations based on current guidelines. From results, these cardiac images were deemed 'rarely appropriate.'	American College of Cardiology Foundation Appropriate Use Criteria Task F, American Society of E, American Heart A, American Society of Nuclear C, Heart Failure Society of A, Heart Rhythm S, et al. ACCF/ASE/AHA/ASNC/ HFSA/HRS/SCAI/SCCM/SCCT/SCMR 2011 Appropriate Use Criteria for Echocardiography. A Report of the American College of Cardiology Foundation Appropriate Use Criteria Task Force, American Society of Echocardiography, American Heart Association, American Society of Nuclear Cardiology, Heart Failure Society of America, Heart Rhythm Society, Society for Cardiovascular Angiography and Interventions, Society of Critical Care Medicine, Society of Cardiovascular Computed Tomography, and Society for Cardiovascular Magnetic Resonance Endorsed by the American College of Chest Physicians. J Am Coll Cardiol. 2011;57(9):1126–66. Hendel RC, Berman DS, Di Carli MF, Heidenreich PA, Henkin RE, Pellikka PA, et al.	Toronto General Hospital; Toronto Western Hospital; Mount Sinai Hospital (August 26, 2013 - March 8, 2014)	Overuse (5.00%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				ACCF/ASNC/ACR/AHA/ASE/SCCT/SCMR/SNM 2009 Appropriate Use Criteria for Cardiac Radionuclide Imaging: A Report of the American College of Cardiology Foundation Appropriate Use Criteria Task Force, the American Society of Nuclear Cardiology, the American College of Radiology, the American Heart Association, the American Society of Echocardiography, the Society of Cardiovascular Computed Tomography, the Society for Cardiovascular Magnetic Resonance, and the Society of Nuclear Medicine. J Am Coll Cardiol. 2009;53(23):2201–29. Patel MR, Bailey SR, Bonow RO, Chambers CE, Chan PS, Dehmer GJ, et al. ACCF/SCAI/AATS/AHA/ASE/ASNC/HFSA/HRS/SCCM/SCCT/SCMR/STS 2012 appropriate use criteria for diagnostic catheterization: a report of the American College of Cardiology Foundation Appropriate Use Criteria Task Force, Society for Cardiovascular Angiography and Interventions, American Association for Thoracic Surgery, American Heart Association, American Society of Echocardiography, American Society of Nuclear Cardiology, Heart Failure Society of America, Heart Rhythm Society, Society of Critical Care Medicine, Society of Cardiovascular Computed Tomography, Society for Cardiovascular Magnetic Resonance, and Society of Thoracic Surgeons. J Am Coll Cardiol. 2012;59(22):1995–2027. Carr JJ, Hendel RC, White RD, Patel MR, Wolk MJ, Bettmann MA, et al. 2013 appropriate utilization of cardiovascular imaging: a methodology for the development of joint criteria for the appropriate utilization of cardiovascular imaging by the American College of Cardiology Foundation and American College of Radiology. J Am Coll Cardiol. 2013;61(21):2199–206.		

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
Remfry, 2015	Diagnostics (Imaging)	Transthoracic Echocardiogram (Trans-thoracic Echocardiogram (TTE) (hospitalized patients with suspected cardiac issues))	Not explicitly stated in study, but authors classified appropriateness of TTEs based on the 2011 AUC for echocardiography. From results, these TTEs were deemed 'rarely appropriate.'	American College of Cardiology Foundation Appropriate Use Criteria Task F, American Society of E, American Heart A, American Society of Nuclear C, Heart Failure Society of A, Heart Rhythm S, et al. ACCF/ASE/AHA/ASNC/ HFSA/HRS/SCAI/SCCM/SCCT/SCMR 2011 Appropriate Use Criteria for Echocardiography. A Report of the American College of Cardiology Foundation Appropriate Use Criteria Task Force, American Society of Echocardiography, American Heart Association, American Society of Nuclear Cardiology, Heart Failure Society of America, Heart Rhythm Society, Society for Cardiovascular Angiography and Interventions, Society of Critical Care Medicine, Society of Cardiovascular Computed Tomography, and Society for Cardiovascular Magnetic Resonance Endorsed by the American College of Chest Physicians. J Am Coll Cardiol. 2011;57(9):1126–66. Hendel RC, Berman DS, Di Carli MF, Heidenreich PA, Henkin RE, Pellikka PA, et al. ACCF/ASNC/ACR/AHA/ASE/SCCT/SCMR/SNM 2009 Appropriate Use Criteria for Cardiac Radionuclide Imaging: A Report of the American College of Cardiology Foundation Appropriate Use Criteria Task Force, the American Society of Nuclear Cardiology, the American College of Radiology, the American Heart Association, the American Society of Echocardiography, the Society of Cardiovascular Computed Tomography, the Society for Cardiovascular Magnetic Resonance, and the Society of Nuclear Medicine. J Am Coll Cardiol. 2009;53(23):2201–29. Patel MR, Bailey SR, Bonow RO, Chambers CE, Chan PS, Dehmer GJ, et al. ACCF/SCAI/AATS/AHA/ASE/ASNC/HFSA/HRS/SCCM/SCCT/SCMR/STS 2012 appropriate use criteria for diagnostic catheterization: a report of the	Toronto General Hospital; Toronto Western Hospital; Mount Sinai Hospital (August 26, 2013 - March 8, 2014)	Overuse (7.00%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				American College of Cardiology Foundation Appropriate Use Criteria Task Force, Society for Cardiovascular Angiography and Interventions, American Association for Thoracic Surgery, American Heart Association, American Society of Echocardiography, American Society of Nuclear Cardiology, Heart Failure Society of America, Heart Rhythm Society, Society of Critical Care Medicine, Society of Cardiovascular Computed Tomography, Society for Cardiovascular Magnetic Resonance, and Society of Thoracic Surgeons. J Am Coll Cardiol. 2012;59(22):1995–2027. Carr JJ, Hendel RC, White RD, Patel MR, Wolk MJ, Bettmann MA, et al. 2013 appropriate utilization of cardiovascular imaging: a methodology for the development of joint criteria for the appropriate utilization of cardiovascular imaging by the American College of Cardiology Foundation and American College of Radiology. J Am Coll Cardiol. 2013;61(21):2199–206.		
Riddell, 2017	Therapeutics (Acute care procedures)	Caesarean delivery (Pregnant Women)	Canadian guidelines recommend that women should not be diagnosed as having labour dystocia and receive a caesarean delivery until they have reached 3–4 cm dilation and are 80–90% effaced.	Fraser W, Krauss I, Boulvain M, Oppenheimer L, Millne K, Liston RM, et al. Dystocia. Society of Obstetricians and Gynaecologists Canada (SOGC) Policy Statement, No.40. J Soc Obstet Gynaecol Canada 1995; 17:985–1001.	Better Outcomes Registry & Network Ontario; Alberta Perinatal Health Program; British Columbia Perinatal Data Registry (2008 - 2012)	Overuse (22.00%)
Rigby, 2017	Therapeutics (Medications)	Antipsychotics-medication(s) not specified	The STOPP (Screening Tool of Older Persons' Prescriptions) criteria were developed to	Grimes D, Gordon J, Snelgrove B, et al. Canadian guidelines on Parkinson's disease. Can J Neurol Sci. 2012;39(4 Suppl 4): S1-30	Health Data Nova Scotia of Dalhousie University	Overuse (40.10%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
		(Parkinson's Disease)	identify potentially inappropriate prescribing practices. One criterion identifies antipsychotics (i.e., other than quetiapine or clozapine) in those with parkinsonism or Lewy body disease as a potentially inappropriate prescribing practice because of the risk of severe extrapyramidal side effects.	Ferreira JJ, Katzenschlager R, Bloem BR, et al. Summary of the recommendations of the EFNS/MDS–ES review on therapeutic management of Parkinson's disease. Eur J Neurol. 2013;20(1):5-15. Available at: http://onlinelibrary.wiley.com/doi/10.1111/j.1468-1331.2012.03866.x/full. Miyasaki JM, Shannon K, Voon V, et al. Practice parameter: evaluation and treatment of depression, psychosis, and dementia in Parkinson disease (an evidence-based review): report of the Quality Standards Subcommittee of the American Academy of Neurology. Neurology. 2006;66(7):996-1002.	(April 1, 2009-March 31, 2014)	
Roux, 2020	Therapeutics (Medications)	Skeletal Muscle Relaxants-medication(s) not specified (Studies of Potentially Inappropriate Medications)	Potentially Inappropriate Medications (PIMs) were identified using the American Geriatrics Society 2015 version of the Beers criteria and skeletal muscle relaxants medications should be avoided generally in older adults.	Tommelein E, Mehuys E, Petrovic M et al. Potentially inappropriate prescribing in community-dwelling older people across Europe: a systematic literature review. Eur J Clin Pharmacol 2015; 71: 1415–27. American Geriatrics Society 2015 Beers Criteria Update Expert Panel. American Geriatrics Society 2015 updated beers criteria for potentially inappropriate medication use in older adults. J Am Geriatr Soc 2015; 63: 2227–46.	Quebec Integrated Chronic Disease Surveillance System database (April 1, 2014-March 31, 2015)	Overuse (3.00%)
Roux, 2020	*Therapeutics (Multiple medication results)*	Analgesics-pentazocine and meperidine (Studies of Potentially Inappropriate Medications)	Potentially Inappropriate Medications (PIMs) were identified using the American Geriatrics Society 2015 version of the Beers criteria and analgesics (include pentazocine and meperidine) should be avoided generally in older adults.	Tommelein E, Mehuys E, Petrovic M et al. Potentially inappropriate prescribing in community-dwelling older people across Europe: a systematic literature review. Eur J Clin Pharmacol 2015; 71: 1415–27. American Geriatrics Society 2015 Beers Criteria Update Expert Panel. American Geriatrics Society 2015 updated beers criteria for potentially inappropriate medication use in older adults. J Am Geriatr Soc 2015; 63: 2227–46.	Quebec Integrated Chronic Disease Surveillance System database (April 1, 2014-March 31, 2015)	Overuse (0.10%)
Roux, 2020	Therapeutics (Medications)	Antidepressants-medication(s) not	Potentially Inappropriate	Tommelein E, Mehuys E, Petrovic M et al. Potentially inappropriate prescribing in community-	Quebec Integrated	Overuse (5.00%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
		specified (Studies of Potentially Inappropriate Medications)	Medications (PIMs) were identified using the American Geriatrics Society 2015 version of the Beers criteria and antidepressants (including tricyclic antidepressants and paroxetime) medications should be avoided generally in older adults.	dwelling older people across Europe: a systematic literature review. Eur J Clin Pharmacol 2015; 71: 1415–27. American Geriatrics Society 2015 Beers Criteria Update Expert Panel. American Geriatrics Society 2015 updated beers criteria for potentially inappropriate medication use in older adults. J Am Geriatr Soc 2015; 63: 2227–46.	Chronic Disease Surveillance System database (April 1, 2014-March 31, 2015)	
Roux, 2020	Therapeutics (Medications)	Antidiuretic-Desmopressin (Studies of Potentially Inappropriate Medications)	Potentially Inappropriate Medications (PIMs) were identified using the American Geriatrics Society 2015 version of the Beers criteria and desmopressin medications should be avoided generally in older adults.	Tommelein E, Mehuys E, Petrovic M et al. Potentially inappropriate prescribing in community-dwelling older people across Europe: a systematic literature review. Eur J Clin Pharmacol 2015; 71: 1415–27. American Geriatrics Society 2015 Beers Criteria Update Expert Panel. American Geriatrics Society 2015 updated beers criteria for potentially inappropriate medication use in older adults. J Am Geriatr Soc 2015; 63: 2227–46.	Quebec Integrated Chronic Disease Surveillance System database (April 1, 2014-March 31, 2015)	Overuse (0.08%)
Roux, 2020	Therapeutics (Medications)	Antihyperglycemics-medication(s) not specified (Studies of Potentially Inappropriate Medications)	Potentially Inappropriate Medications (PIMs) were identified using the American Geriatrics Society 2015 version of the Beers criteria and long-duration sulfonylureas medications should be avoided generally in older adults.	Tommelein E, Mehuys E, Petrovic M et al. Potentially inappropriate prescribing in community-dwelling older people across Europe: a systematic literature review. Eur J Clin Pharmacol 2015; 71: 1415–27. American Geriatrics Society 2015 Beers Criteria Update Expert Panel. American Geriatrics Society 2015 updated beers criteria for potentially inappropriate medication use in older adults. J Am Geriatr Soc 2015; 63: 2227–46.	Quebec Integrated Chronic Disease Surveillance System database (April 1, 2014-March 31, 2015)	Overuse (3.30%)
Roux, 2020	*Therapeutics (Multiple medication results)*	Antiparkinsonian medications-multiple medications-medications not specified (Studies	Potentially Inappropriate Medications (PIMs) were identified using the American Geriatrics Society 2015 version of	Tommelein E, Mehuys E, Petrovic M et al. Potentially inappropriate prescribing in community-dwelling older people across Europe: a systematic literature review. Eur J Clin Pharmacol 2015; 71: 1415–27.	Quebec Integrated Chronic Disease Surveillance System	Overuse (0.10%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
		of Potentially Inappropriate Medications)	the Beers criteria and antiparkinsonian medications should be avoided generally in older adults.	American Geriatrics Society 2015 Beers Criteria Update Expert Panel. American Geriatrics Society 2015 updated beers criteria for potentially inappropriate medication use in older adults. J Am Geriatr Soc 2015; 63: 2227–46.	database (April 1, 2014-March 31, 2015)	
Roux, 2020	Therapeutics (Medications)	Antipsychotics-medication(s) not specified (Studies of Potentially Inappropriate Medications)	Potentially Inappropriate Medications (PIMs) were identified using the American Geriatrics Society 2015 version of the Beers criteria and antipsychotic medications should be avoided generally in older adults.	Tommelein E, Mehuys E, Petrovic M et al. Potentially inappropriate prescribing in community-dwelling older people across Europe: a systematic literature review. Eur J Clin Pharmacol 2015; 71: 1415–27. American Geriatrics Society 2015 Beers Criteria Update Expert Panel. American Geriatrics Society 2015 updated beers criteria for potentially inappropriate medication use in older adults. J Am Geriatr Soc 2015; 63: 2227–46.	Quebec Integrated Chronic Disease Surveillance System database (April 1, 2014-March 31, 2015)	Overuse (5.60%)
Roux, 2020	Therapeutics (Medications)	Antispasmodics-medication(s) not specified (Studies of Potentially Inappropriate Medications)	Potentially Inappropriate Medications (PIMs) were identified using the American Geriatrics Society 2015 version of the Beers criteria and antispasmodic medications should be avoided generally in older adults.	Tommelein E, Mehuys E, Petrovic M et al. Potentially inappropriate prescribing in community-dwelling older people across Europe: a systematic literature review. Eur J Clin Pharmacol 2015; 71: 1415–27. American Geriatrics Society 2015 Beers Criteria Update Expert Panel. American Geriatrics Society 2015 updated beers criteria for potentially inappropriate medication use in older adults. J Am Geriatr Soc 2015; 63: 2227–46.	Quebec Integrated Chronic Disease Surveillance System database (April 1, 2014-March 31, 2015)	Overuse (0.10%)
Roux, 2020	Therapeutics (Medications)	Antithrombotic-medication not specified (Studies of Potentially Inappropriate Medications)	Potentially Inappropriate Medications (PIMs) were identified using the American Geriatrics Society 2015 version of the Beers criteria and antithrombotic medications should be avoided generally in older adults.	Tommelein E, Mehuys E, Petrovic M et al. Potentially inappropriate prescribing in community-dwelling older people across Europe: a systematic literature review. Eur J Clin Pharmacol 2015; 71: 1415–27. American Geriatrics Society 2015 Beers Criteria Update Expert Panel. American Geriatrics Society 2015 updated beers criteria for potentially inappropriate medication use in older adults. J Am Geriatr Soc 2015; 63: 2227–46.	Quebec Integrated Chronic Disease Surveillance System database (April 1, 2014-March 31, 2015)	Overuse (0.02%)
Roux, 2020	Therapeutics (Medications)	Barbiturates (Studies of Potentially	Potentially Inappropriate Medications (PIMs)	Tommelein E, Mehuys E, Petrovic M et al. Potentially inappropriate prescribing in community-dwelling older people across Europe: a systematic	Quebec Integrated Chronic	Overuse (0.10%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
		Inappropriate Medications)	were identified using the American Geriatrics Society 2015 version of the Beers criteria and barbiturate medications should be avoided generally in older adults.	literature review. Eur J Clin Pharmacol 2015; 71: 1415–27. American Geriatrics Society 2015 Beers Criteria Update Expert Panel. American Geriatrics Society 2015 updated beers criteria for potentially inappropriate medication use in older adults. J Am Geriatr Soc 2015; 63: 2227–46.	Disease Surveillance System database (April 1, 2014-March 31, 2015)	
Roux, 2020	Therapeutics (Medications)	Benzodiazepines-medication(s) not specified (Studies of Potentially Inappropriate Medications)	Potentially Inappropriate Medications (PIMs) were identified using the American Geriatrics Society 2015 version of the Beers criteria and benzodiazepine medications should be avoided generally in older adults.	Tommelein E, Mehuys E, Petrovic M et al. Potentially inappropriate prescribing in community-dwelling older people across Europe: a systematic literature review. Eur J Clin Pharmacol 2015; 71: 1415–27. American Geriatrics Society 2015 Beers Criteria Update Expert Panel. American Geriatrics Society 2015 updated beers criteria for potentially inappropriate medication use in older adults. J Am Geriatr Soc 2015; 63: 2227–46.	Quebec Integrated Chronic Disease Surveillance System database (April 1, 2014-March 31, 2015)	Overuse (25.70%)
Roux, 2020	*Therapeutics (Multiple medication results)*	Cardiovascular Medications-Disopyramide, Dronedarone, Digoxin, Short-acting Nifedipine, Amiodarone (Studies of Potentially Inappropriate Medications)	Potentially Inappropriate Medications (PIMs) were identified using the American Geriatrics Society 2015 version of the Beers criteria and cardiovascular medications (including disopyramide, dronedarone, digoxin, short-acting nifedipine and amiodarone) medications should be avoided generally in older adults.	Tommelein E, Mehuys E, Petrovic M et al. Potentially inappropriate prescribing in community-dwelling older people across Europe: a systematic literature review. Eur J Clin Pharmacol 2015; 71: 1415–27. American Geriatrics Society 2015 Beers Criteria Update Expert Panel. American Geriatrics Society 2015 updated beers criteria for potentially inappropriate medication use in older adults. J Am Geriatr Soc 2015; 63: 2227–46.	Quebec Integrated Chronic Disease Surveillance System database (April 1, 2014-March 31, 2015)	Overuse (0.60%)
Roux, 2020	Therapeutics (Medications)	Central Alpha Blockers-medication(s) not specified (Studies of Potentially	Potentially Inappropriate Medications (PIMs) were identified using the American Geriatrics Society 2015 version of	Tommelein E, Mehuys E, Petrovic M et al. Potentially inappropriate prescribing in community-dwelling older people across Europe: a systematic literature review. Eur J Clin Pharmacol 2015; 71: 1415–27.	Quebec Integrated Chronic Disease Surveillance System	Overuse (1.30%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
		Inappropriate Medications)	the Beers criteria and central alpha blocker medications should be avoided generally in older adults.	American Geriatrics Society 2015 Beers Criteria Update Expert Panel. American Geriatrics Society 2015 updated beers criteria for potentially inappropriate medication use in older adults. J Am Geriatr Soc 2015; 63: 2227–46.	database (April 1, 2014-March 31, 2015)	
Roux, 2020	Therapeutics (Medications)	First Generation Antihistamines-multiple medications-medications not specified (Studies of Potentially Inappropriate Medications)	Potentially Inappropriate Medications (PIMs) were identified using the American Geriatrics Society 2015 version of the Beers criteria and first generation antihistamine medications should be avoided generally in older adults.	Tommelein E, Mehuys E, Petrovic M et al. Potentially inappropriate prescribing in community-dwelling older people across Europe: a systematic literature review. Eur J Clin Pharmacol 2015; 71: 1415–27. American Geriatrics Society 2015 Beers Criteria Update Expert Panel. American Geriatrics Society 2015 updated beers criteria for potentially inappropriate medication use in older adults. J Am Geriatr Soc 2015; 63: 2227–46.	Quebec Integrated Chronic Disease Surveillance System database (April 1, 2014-March 31, 2015)	Overuse (1.90%)
Roux, 2020	Therapeutics (Medications)	Non-benzodiazepine and Benzodiazepine Receptor Agonist Hypnotics (Studies of Potentially Inappropriate Medications)	Potentially Inappropriate Medications (PIMs) were identified using the American Geriatrics Society 2015 version of the Beers criteria and Non-benzodiazepine hypnotic medications should be avoided generally in older adults.	Tommelein E, Mehuys E, Petrovic M et al. Potentially inappropriate prescribing in community-dwelling older people across Europe: a systematic literature review. Eur J Clin Pharmacol 2015; 71: 1415–27. American Geriatrics Society 2015 Beers Criteria Update Expert Panel. American Geriatrics Society 2015 updated beers criteria for potentially inappropriate medication use in older adults. J Am Geriatr Soc 2015; 63: 2227–46.	Quebec Integrated Chronic Disease Surveillance System database (April 1, 2014-March 31, 2015)	Overuse (0.01%)
Roux, 2020	Therapeutics (Medications)	Nonsteroidal Anti-inflammatory Drugs-medication(s) not specified (Studies of Potentially Inappropriate Medications)	Potentially Inappropriate Medications (PIMs) were identified using the American Geriatrics Society 2015 version of the Beers criteria and chronic use of NSAIDs (>90 days) (except for indomethacin and ketorolac, which are inappropriate when	Tommelein E, Mehuys E, Petrovic M et al. Potentially inappropriate prescribing in community-dwelling older people across Europe: a systematic literature review. Eur J Clin Pharmacol 2015; 71: 1415–27. American Geriatrics Society 2015 Beers Criteria Update Expert Panel. American Geriatrics Society 2015 updated beers criteria for potentially inappropriate medication use in older adults. J Am Geriatr Soc 2015; 63: 2227–46.	Quebec Integrated Chronic Disease Surveillance System database (April 1, 2014-March 31, 2015)	Overuse (0.50%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
			used once) medications should be avoided generally in older adults.			
Roux, 2020	Therapeutics (Medications)	Peripheral Alpha-1 Blockers-medication(s) not specified (Studies of Potentially Inappropriate Medications)	Potentially Inappropriate Medications (PIMs) were identified using the American Geriatrics Society 2015 version of the Beers criteria and peripheral alpha-1 blocker medications should be avoided generally in older adults.	Tommelein E, Mehuys E, Petrovic M et al. Potentially inappropriate prescribing in community-dwelling older people across Europe: a systematic literature review. Eur J Clin Pharmacol 2015; 71: 1415–27. American Geriatrics Society 2015 Beers Criteria Update Expert Panel. American Geriatrics Society 2015 updated beers criteria for potentially inappropriate medication use in older adults. J Am Geriatr Soc 2015; 63: 2227–46.	Quebec Integrated Chronic Disease Surveillance System database (April 1, 2014-March 31, 2015)	Overuse (1.20%)
Roux, 2020	Therapeutics (Medications)	Proton Pump Inhibitors-medication(s) not specified (Studies of Potentially Inappropriate Medications)	Potentially Inappropriate Medications (PIMs) were identified using the American Geriatrics Society 2015 version of the Beers criteria and Proton Pump Inhibitors (PPI) taken longer than 56 days should be avoided generally in older adults.	Tommelein E, Mehuys E, Petrovic M et al. Potentially inappropriate prescribing in community-dwelling older people across Europe: a systematic literature review. Eur J Clin Pharmacol 2015; 71: 1415–27. American Geriatrics Society 2015 Beers Criteria Update Expert Panel. American Geriatrics Society 2015 updated beers criteria for potentially inappropriate medication use in older adults. J Am Geriatr Soc 2015; 63: 2227–46.	Quebec Integrated Chronic Disease Surveillance System database (April 1, 2014-March 31, 2015)	Overuse (21.30%)
Rowe, 2018	Therapeutics (Psychosocial Therapy)	Education Post-Concussion (Mild Traumatic Brain Injury or Concussion)	Recommended that patients diagnosed with a concussion receive structured discharge instructions and educational advice about the symptoms, sequelae, and normal progression of concussion provided by ED staff.	Leddy JJ, Sandhu H, SodhiV, et al. Rehabilitation of concussion and post-concussion syndrome. Sports Health 2012; 4:147–54. Rohling ML, Faust ME, Beverly B, Demakis G. Effectiveness of cognitive rehabilitation following acquired brain injury: a meta-analytic re-examination of Cicerone et al's (2000, 2005) systematic reviews. Neuropsychology. 2009;23(1):20-39.	Not specified (April 2013 - April 2015)	Underuse (52.00%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
Sadatsafvi, 2017	Therapeutics (Medications)	Short-acting Beta-Agonists-medication(s) not specified (Asthma)	Inappropriate prescription was defined as greater than two puffs of a short-acting beta-agonists (SABA) per week if no Inhaled corticosteroids (ICS) was used and nine or more canisters of SABA and no more than 100 mg (beclomethasone equivalent) per day of ICS. Appropriate prescription was defined as receiving fewer than two puffs per week in the absence of ICS or filling prescriptions for four or fewer SABA canisters per year and at least 400 mg per day of ICS. Individuals could fall into a "gray zone," in which the definition for either appropriate or inappropriate prescription was not satisfied.	Global Initiative for Asthma. GINA Report, Global Strategy for Asthma Management and Prevention, 2015. http://ginasthma.org/gina-reports/. Accessed July 7, 2016	British Columbia administrative databases (January 1, 2007-December 31, 2013)	Overuse (5.30%)
Sauro, 2019	Therapeutics (Biophysical Therapy)	Albumin Transfusion (Fluid Resuscitation)	Recommended that albumin should not be used for fluid resuscitation.	Fowler RA, Mittmann N, Geerts W, et al. Cost-effectiveness of dalteparin vs unfractionated heparin for the prevention of venous thromboembolism in critically ill patients. JAMA 2014; 312:2135–45. Hirsh J, Raschke R. Heparin and low-molecular-weight heparin: the Seventh ACCP Conference on Antithrombotic and Thrombolytic Therapy. Chest 2004;126(3 Suppl):188s–203.	eCritical TRACER (January 1, 2014 - December 31, 2014)	Overuse (20.00%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				Li G, Cook DJ, Levine MA, et al. Competing risk analysis for evaluation of dalteparin versus unfractionated heparin for venous thromboembolism in medical-surgical critically Ill patients. Medicine 2015;94: e1479. Alberta Health Services. Venous thromboembolism prophylaxis (document #PS09-01). 2016. https:// extranet. ahsnet. ca/ teams/ policydocuments/ 1/ clp-venous- thromboembolism- prophylaxis- ps09- 01-guideline. pdf. Rhodes A, Evans LE, Alhazzani W, et al. Surviving sepsis campaign: International guidelines for management of sepsis and septic shock: 2016. Crit Care Med 2017; 45:486–552. Finfer S, Bellomo R, Boyce N, et al. A comparison of albumin and saline for fluid resuscitation in the intensive care unit. N Engl J Med 2004; 350:2247–56. Lyu PF, Hockenberry JM, Gaydos LM, et al. Impact of a sequential intervention on albumin utilization in critical Care. Crit Care Med 2016; 44:1307–13. Navickis RJ, Greenhalgh DG, Wilkes MM. Albumin in burn shock resuscitation: a meta-analysis of controlled clinical studies. J Burn Care Res 2016;37: e268–78. Patel A, Laffan MA, Waheed U, et al. Randomised trials of human albumin for adults with sepsis: systematic review and metaanalysis with trial sequential analysis of all-cause mortality. BMJ 2014;349: g4561. European Association for the Study of the Liver. EASL clinical practice guidelines on the management of ascites, spontaneous bacterial peritonitis, and		

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				hepatorenal syndrome in cirrhosis. J Hepatol 2010; 53:397–417. Bernardi M, Caraceni P, Navickis RJ, et al. Albumin infusion in patients undergoing large-volume paracentesis: a meta-analysis of randomized trials. Hepatology 2012; 55:1172–81.		
Sauro, 2019	Therapeutics (Medications)	Venous Thromboembolism Prophylaxis (Not Specified)	Recommended that Low Molecular Weight Heparin (LMWH) be prescribed to patients for venous thromboembolism (VTE) prophylaxis (unless otherwise contraindicated). Contraindications to pharmacological prophylaxis included a diagnosis potentially associated with a high risk of bleeding, daily assessed platelet count <50×109/L, International Normalized Ratio (INR) ≥2, Partial Thromboplastin Time (PTT) ≥55 s or receipt of therapeutic anticoagulation.	Fowler RA, Mittmann N, Geerts W, et al. Cost-effectiveness of dalteparin vs unfractionated heparin for the prevention of venous thromboembolism in critically ill patients. JAMA 2014; 312:2135–45. Hirsh J, Raschke R. Heparin and low-molecular-weight heparin: the Seventh ACCP Conference on Antithrombotic and Thrombolytic Therapy. Chest 2004;126(3 Suppl):188s–203. Li G, Cook DJ, Levine MA, et al. Competing risk analysis for evaluation of dalteparin versus unfractionated heparin for venous thromboembolism in medical-surgical critically Ill patients. Medicine 2015;94: e1479. Alberta Health Services. Venous thromboembolism prophylaxis (document #PS09-01). 2016. https:// extranet. ahsnet. ca/ teams/ policydocuments/ 1/ clp-venous- thromboembolism- prophylaxis- ps09- 01-guideline. pdf. Rhodes A, Evans LE, Alhazzani W, et al. Surviving sepsis campaign: International guidelines for management of sepsis and septic shock: 2016. Crit Care Med 2017; 45:486–552. Finfer S, Bellomo R, Boyce N, et al. A comparison of albumin and saline for fluid resuscitation in the intensive care unit. N Engl J Med 2004; 350:2247–56.	eCritical TRACER (January 1, 2014 - December 31, 2014)	Overuse (45.30%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				Lyu PF, Hockenberry JM, Gaydos LM, et al. Impact of a sequential intervention on albumin utilization in critical Care. Crit Care Med 2016; 44:1307–13. Navickis RJ, Greenhalgh DG, Wilkes MM. Albumin in burn shock resuscitation: a meta-analysis of controlled clinical studies. J Burn Care Res 2016;37: e268–78. Patel A, Laffan MA, Waheed U, et al. Randomised trials of human albumin for adults with sepsis: systematic review and metaanalysis with trial sequential analysis of all-cause mortality. BMJ 2014;349: g4561. European Association for the Study of the Liver. EASL clinical practice guidelines on the management of ascites, spontaneous bacterial peritonitis, and hepatorenal syndrome in cirrhosis. J Hepatol 2010; 53:397–417. Bernardi M, Caraceni P, Navickis RJ, et al. Albumin infusion in patients undergoing large-volume paracentesis: a meta-analysis of randomized trials. Hepatology 2012; 55:1172–81.		
Sauro, 2019	Therapeutics (Medications)	Venous Thromboembolism Prophylaxis (Cancer)	Recommended that Low Molecular Weight Heparin (LMWH) be prescribed to patients for venous thromboembolism (VTE) prophylaxis (unless otherwise contraindicated). Contraindications to pharmacological prophylaxis included a diagnosis potentially associated with a high risk of bleeding, daily	Fowler RA, Mittmann N, Geerts W, et al. Cost-effectiveness of dalteparin vs unfractionated heparin for the prevention of venous thromboembolism in critically ill patients. JAMA 2014; 312:2135–45. Hirsh J, Raschke R. Heparin and low-molecular-weight heparin: the Seventh ACCP Conference on Antithrombotic and Thrombolytic Therapy. Chest 2004;126(3 Suppl):188s–203. Li G, Cook DJ, Levine MA, et al. Competing risk analysis for evaluation of dalteparin versus unfractionated heparin for venous thromboembolism in medical-surgical critically Ill patients. Medicine 2015;94: e1479.	eCritical TRACER (January 1, 2014 - December 31, 2014)	Underuse (61.30%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
			assessed platelet count <50×109/L, International Normalized Ratio (INR) ≥2, Partial Thromboplastin Time (PTT) ≥55 s or receipt of therapeutic anticoagulation.	Alberta Health Services. Venous thromboembolism prophylaxis (document #PS09-01). 2016. https:// extranet. ahsnet. ca/ teams/ policydocuments/ 1/ clp-venous- thromboembolism- prophylaxis- ps09- 01-guideline. pdf. Rhodes A, Evans LE, Alhazzani W, et al. Surviving sepsis campaign: International guidelines for management of sepsis and septic shock: 2016. Crit Care Med 2017; 45:486–552. Finfer S, Bellomo R, Boyce N, et al. A comparison of albumin and saline for fluid resuscitation in the intensive care unit. N Engl J Med 2004; 350:2247–56. Lyu PF, Hockenberry JM, Gaydos LM, et al. Impact of a sequential intervention on albumin utilization in critical Care. Crit Care Med 2016; 44:1307–13. Navickis RJ, Greenhalgh DG, Wilkes MM. Albumin in burn shock resuscitation: a meta-analysis of controlled clinical studies. J Burn Care Res 2016;37: e268–78. Patel A, Laffan MA, Waheed U, et al. Randomised trials of human albumin for adults with sepsis: systematic review and metaanalysis with trial sequential analysis of all-cause mortality. BMJ 2014;349: g4561. European Association for the Study of the Liver. EASL clinical practice guidelines on the management of ascites, spontaneous bacterial peritonitis, and hepatorenal syndrome in cirrhosis. J Hepatol 2010; 53:397–417. Bernardi M, Caraceni P, Navickis RJ, et al. Albumin infusion in patients undergoing large-volume		

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				paracentesis: a meta-analysis of randomized trials. Hepatology 2012; 55:1172–81.		
Sawler, 2020	Therapeutics (Biophysical Therapy)	Plasma Exchange (Not Specified)	Guidelines recommend prompt initiation of plasma exchange, preferably within 4–8 h, in all patients who present with a microangiopathic hemolytic anemia (MAHA) and thrombocytopenia in the absence of other causes.	G.A. Rock, K.H. Shumak, N.A. Buskard, et al., Comparison of plasma exchange with plasma infusion in the treatment of thrombotic thrombocytopenic purpura. Canadian Apheresis Study Group, N Engl J Med 325 (1991) 393–397. M. Scully, B.J. Hunt, S. Benjamin, R. Liesner, P. Rose, F. Peyvandi, B. Cheung, S.J. Machin, British Committee for Standards in Haematology, Guidelines on the diagnosis and management of thrombotic thrombocytopenic purpura and other thrombotic microangiopathies, Br J Haematol 158 (2012) 323–335. C. Howell, K. Douglas, G. Cho, K. El-Ghariani, P. Taylor, D. Potok, et al., Guideline on the clinical use of apheresis procedures for the treatment of patients and collection of cellular therapy products. British Committee for Standards in Haematology, Transfus Med 25 (2015) 57–78.	Foothills Medical Centre; University of Alberta Hospital (January 2008-December 2018)	Underuse (63.80%)
Scales, 2016	Therapeutics (Biophysical Therapy)	Withdrawing Life-Sustaining Treatment (Cardiovascular Arrest)	Appropriate neurologic prognostication was defined as follows: (1a) no withdrawal of life support treatment (WLST) leading to death based on estimates of neurologic prognosis during the first 72 hours and (1b) no WLST leading to death in the absence of at least one clinical predictor of poor neurologic prognosis observed between 72 hours and 7 days or (2)	Morrison LJ, Deakin CD, Morley PT, Callaway CW, Kerber RE, Kronick SL, Lavonas EJ, Link MS, Neumar RW, Otto CW, et al. Advanced life support: 2010 international consensus on cardiopulmonary resuscitation and emergency cardiovascular care science with treatment recommendations. Circulation 2010;122: S345–S421 Peberdy MA, Callaway CW, Neumar RW, Geocadin RG, Zimmerman JL, Donnino M, Gabrielli A, Silvers SM, Zaritsky AL, Merchant R, et al. Post-cardiac arrest care: 2010 American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care. Circulation 2010;122: S768–S786.	Not specified (June 1, 2011-June 30, 2014)	Overuse (32.00%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
			surviving beyond 7 days.	Callaway CW, Donnino MW, Fink EL, Geocadin RG, Golan E, Kern KB, Leary M, Meurer WJ, Peberdy MA, Thompson TM, et al. Post-cardiac arrest care: 2015 American Heart Association Guidelines Update for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care. Circulation 2015;132: S465–S482.		
Schuh, 2017	*Therapeutics (Multiple medication results)*	Pharmacotherapy (Epinephrine, Salbutamol, Hypertonic saline, Corticosteroid) (Acute Bronchiolitis)	Administration of inhaled epinephrine, salbutamol, hypertonic saline, or systemic corticosteroids in the Emergency Department (ED) are not routinely recommended in bronchiolitis for pediatric patients.	American Academy of Pediatrics Subcommittee on Diagnosis and Management of Bronchiolitis. Diagnosis and management of bronchiolitis. Pediatrics. 2006;118(4):1774–1793 Ralston SL, Lieberthal AS, Meissner HC, et al; American Academy of Pediatrics. Clinical practice guideline: the diagnosis, management, and prevention of bronchiolitis [published correction appears in Pediatrics. 2014;134(5): e1474–e1502]. Pediatrics. 2014;134(5). Available at: www.pediatrics.org/cgi/content/full/134/5/e1474 Friedman JN, Rieder MJ, Walton JM; Canadian Paediatric Society, Acute Care Committee, Drug Therapy and Hazardous Substances Committee. Bronchiolitis: Recommendations for diagnosis, monitoring and management of children one to 24 months of age. Paediatr Child Health. 2014;19(9):485–498 Scottish Intercollegiate Guidelines Network. Bronchiolitis in Children: A National Clinical Guideline. Edinburgh, UK: Scottish Intercollegiate Guideline Network; 2006. Guideline No. 91 Turner T, Wilkinson F, Harris C, Mazza D; Health for Kids Guideline Development Group. Evidence based guideline for the management of bronchiolitis. Aust Fam Physician. 2008;37(6 spec no):6–13 Barben J, Kuehni CE, Trachsel D, Hammer J; Swiss Paediatric Respiratory Research Group. Management	Pediatric Emergency Research Network Hospitals (January 1, 2013 - December 31, 2013)	Overuse (46.00%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				of acute bronchiolitis: can evidence based guidelines alter clinical practice? Thorax. 2008;63(12):1103–1109 National Institute for Health and Care Excellence. Bronchiolitis in children: diagnosis and management. 2015. Available at: https://www.nice.org.uk/guidance/ng9. Accessed June 24, 2016		
Schuh, 2017	Diagnostics (Imaging)	Radiography-Chest (Bronchiolitis)	Use of chest radiography in not routinely recommended in bronchiolitis.	American Academy of Pediatrics Subcommittee on Diagnosis and Management of Bronchiolitis. Diagnosis and management of bronchiolitis. Pediatrics. 2006;118(4):1774–1793 Ralston SL, Lieberthal AS, Meissner HC, et al; American Academy of Pediatrics. Clinical practice guideline: the diagnosis, management, and prevention of bronchiolitis [published correction appears in Pediatrics. 2014;134(5): e1474–e1502]. Pediatrics. 2014;134(5). Available at: www.pediatrics.org/cgi/content/full/134/5/e1474 Friedman JN, Rieder MJ, Walton JM; Canadian Paediatric Society, Acute Care Committee, Drug Therapy and Hazardous Substances Committee. Bronchiolitis: Recommendations for diagnosis, monitoring and management of children one to 24 months of age. Paediatr Child Health. 2014;19(9):485–498 Scottish Intercollegiate Guidelines Network. Bronchiolitis in Children: A National Clinical Guideline. Edinburgh, UK: Scottish Intercollegiate Guideline Network; 2006. Guideline No. 91 Turner T, Wilkinson F, Harris C, Mazza D; Health for Kids Guideline Development Group. Evidence based guideline for the management of bronchiolitis. Aust Fam Physician. 2008;37(6 spec no):6–13	Pediatric Emergency Research Network Hospitals (January 1, 2013 - December 31, 2013)	Overuse (34.00%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				Barben J, Kuehni CE, Trachsel D, Hammer J; Swiss Paediatric Respiratory Research Group. Management of acute bronchiolitis: can evidence based guidelines alter clinical practice? Thorax. 2008;63(12):1103–1109 National Institute for Health and Care Excellence. Bronchiolitis in children: diagnosis and management. 2015. Available at: https://www.nice.org.uk/guidance/ng9. Accessed June 24, 2016		
Scovil, 2019	Diagnostics (Screening)	Pressure Ulcer (Spinal Cord Injury Patients)	Recommended that an overall risk assessment rate be completed for preventing pressure injuries in Spinal Cord Injury (SCI) patients. Specific screening tool not specified in study.	Consortium for Spinal Cord Medicine. Pressure ulcer prevention and treatment following spinal cord injury: a clinical practice guideline for health-care professionals. J Spinal Cord Med 2001;24(Suppl 1): S40-101. Houghton PE, Campbell KE; CPG Panel. Canadian best practice guidelines for the prevention and management of pressure ulcers in people with spinal cord injury. Available at: http://onf.org/system/ attachments/168/original/ Pressure_ Ulcers_Best_Practice_Guideline_Final_web4.pdf. Accessed January 12, 2018. Regan M, Teasell RW, Keast D, Aubut JL, Foulon BL, Mehta S. Pressure ulcers following spinal cord injury. In: Eng JJ, Teasell RW, Miller WC, Wolfe DL, Townson AF, Hsieh JTC, Connolly SJ, Mehta S, Sakakibara BM, editors. Spinal Cord Injury Rehabilitation Evidence. Version 3.0. 2010. Available at: http://scireproject.com/ wp-content/uploads/pressure_ulcers.pdf. Accessed December 18, 2018.	Glenrose Rehabilitation Hospital; Foothills Medical Centre; Parkwood Institute - St. Joseph's Health Care; Toronto Rehabilitation Institute University Health Network; Centre Inte´gre´ Universitaire de Sante´ et de Services Sociaux du Centre-Sud-de- l'ıˆle-de-Montre´aldInstitut deRe´adaptation Gingras-Lindsay-de-	Underuse (54.30%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
					Montre´al; and Centre Inte´gre´ Universitaire de Sante´ et de ServicesSociaux de la Capitale-NationaledInstitut de Re´adaptation enDe´ficience Physique de Québec (2011 - 2015)	
Scovil, 2019	Therapeutics (Psychosocial Therapy)	Patient Education-at least 1 type (Spinal Cord Injury Patients)	Recommended that the delivery of educational materials be completed for preventing pressure injuries in Spinal Cord Injury (SCI) patients.	Consortium for Spinal Cord Medicine. Pressure ulcer prevention and treatment following spinal cord injury: a clinical practice guideline for health-care professionals. J Spinal Cord Med 2001;24(Suppl 1): S40-101. Houghton PE, Campbell KE; CPG Panel. Canadian best practice guidelines for the prevention and management of pressure ulcers in people with spinal cord injury. Available at: http://onf.org/system/ attachments/168/original/ Pressure_ Ulcers_Best_Practice_Guideline_Final_web4.pdf. Accessed January 12, 2018. Regan M, Teasell RW, Keast D, Aubut JL, Foulon BL, Mehta S. Pressure ulcers following spinal cord injury. In: Eng JJ, Teasell RW, Miller WC, Wolfe DL, Townson AF, Hsieh JTC, Connolly SJ, Mehta S, Sakakibara BM, editors. Spinal Cord Injury Rehabilitation Evidence. Version 3.0. 2010. Available at: http://scireproject.com/ wp-content/uploads/pressure_ulcers.pdf. Accessed December 18, 2018.	Glenrose Rehabilitation Hospital; Foothills Medical Centre; Parkwood Institute - St. Joseph's Health Care; Toronto Rehabilitation Institute University Health Network; Centre Inte´gre´ Universitaire de Sante´ et de Services Sociaux du Centre-Sud-de- l'ıˆle-de-Montre´aldIns	Underuse (71.00%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
					titut deRe´adaptation Gingras-Lindsay-de-Montre´al; and Centre Inte´gre´ Universitaire de Sante´ et de ServicesSociaux de la Capitale-NationaledInstitut de Re´adaptation enDe´ficience Physique de Québec (2011 - 2015)	
Sharma, 2019	Therapeutics (Medications)	Opioids-medication(s) not specified (Studies of Potentially Inappropriate Medications)	Clinical practice guidelines for the management of anxiety disorders and insomnia suggest that benzodiazepine receptor modulator treatment is appropriate for short-term use in adults (aged 20 to 64) and in some cases as second-line treatment. Concurrent use of these medications is a risk factor for fatal opioid overdose.	Busse JW, Craigie S, Juurlink DN, et al. Guideline for opioid therapy and chronic noncancer pain. CMAJ 2017;189: E659–66. CPSA. Clinical toolkit benzodiazepines: use and taper. CPSA, 2015. Katzman MA, Bleau P, Blier P, et al. Canadian clinical practice guidelines for the management of anxiety, posttraumatic stress and obsessive-compulsive disorders. BMC Psychiatry 2014;14(Suppl 1):S1. Canadian Pharmacists Association. RxTx, 2019. Available: https://www.e-therapeutics.ca/search TOP. T.O.P. Guideline for Adult Primary Insomnia [Internet], 2010. Available: http://www.topalbertadoctors.org/download/439/insomnia_management_guideline.pdf	Alberta Netcare's Pharmaceutical InformationNetwork (January 1, 2017-December 31, 2017)	Overuse (17.60%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				Ismp Canada. Essential clinical skills for opioid prescribers, 2017. Available: https://www.ismp-canada.org/download/OpioidStewardship/Opioid-Prescribing-Skills.pdf Centers for Disease Control and Prevention. Guideline for prescribing opioids for chronic pain, 2016. Available: https://www.cdc.gov/drugoverdose/pdf/Guidelines_Factsheet-a.pdf Gudin JA, Mogali S, Jones JD, et al. Risks, management, and monitoring of combination opioid, benzodiazepines, and/or alcohol use. Postgrad Med 2013; 125:115–30.		
Shih, 2017	Therapeutics (Biophysical Therapy)	Intravenous Immune Globulin Transfusion (Not Specified)	Medical conditions requiring IVIG (adapted from Canadian guideline) by specialty: Haematology: Fetal/Neonatal alloimmune thrombocytopenia, Haemolytic disease of the fetus and newborn, Immune thrombocytopenic purpura (ITP), Post-transfusion purpura, Acquired haemophilia, Acquired red cell aplasia, Acquired von Willebrand's disease, Allogeneic bone marrow or stem cell transplantation, Autoimmune haemolytic anaemia, Autoimmune neutropenia,	Leong, H., Stachnik, J., Bonk, M.E., Matuszewski, K.A. (2008) Unlabeled uses of intravenous immune globulin. American Journal of Health-System Pharmacy, 65, 1815–1824. Ontario Regional Blood Coordinating Network (ORBCoN). (2012c) Ontario Intravenous Immune Globulin (IVIG) Utilization Management Guidelines Version 2.0	Not specified (January 2014-December 2014)	Overuse (56.70%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
			Haemolytic transfusion reaction, Haemolytic transfusion reaction in sickle cell disease, Haemolytic uremic syndrome (HUS) and thrombotic thrombocytopenic purpura (TTP), Virus associated hemophagocytic syndrome; Neurology: Chronic inflammatory demyelinating polyneuropathy (CIDP), Guillain–Barré syndrome (GBS), Multifocal motor neuropathy (MMN), Myasthenia gravis (MG), Acute disseminated encephalomyelitis (ADEM), Lambert-Eaton myasthenic syndrome (LEMS), Multiple sclerosis (MS), Paediatric autoimmune neuropsychiatric disorders associated with streptococcal infections (PANDAS), Polymyositis, Rasmussen's encephalitis, Stiff person's syndrome; Dermatology: Dermatomyositis, Pemphigus vulgaris (PV) and variants, Toxic epidermal			

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
			necrolysis/Stevens-Johnson syndrome; Rheumatology: Juvenile dermatomyositis, Kawasaki disease; Infectious diseases: Staphylococcal toxic shock, Invasive group streptococcal fasciitis with associated toxic shock; Immunology: Primary immune deficiency (PID) and secondary immune deficiency (SID), Haematopoietic stem cell transplant in primary immunodeficiencies; Solid organ transplantation: Acute antibody mediated rejection in patients who have received living donor/deceased kidney donor transplant, Kidney transplant from living donor to whom the patient is sensitised, Kidney transplantation with donor-specific antibodies in recipient.			
Shurrab, 2017	Therapeutics (Medications)	Oral Anticoagulation Therapy (Not Specified)	Guidelines for stroke prevention recommend OAC for atrial fibrillation patients ≥65 years old.	Verma A, Cairns JA, Mitchell LB, Macle L, Stiell IG, Gladstone D, et al. 2014 focused update of the Canadian Cardiovascular Society Guidelines for the management of atrial fibrillation. Can J Cardiol. 2014; 30:1114–30.	Not specified (May, 2015)	Underuse (37.00%)
Siemens, 2020	Therapeutics (Biophysical Therapy)	Chemotherapy (Neoadjuvant or Adjuvant) (Bladder Cancer)	Not explicitly provided in study; from results, recommendation: patients with bladder	Kassouf W, Aprikian A, Black P, et al. Recommendations for the improvement of bladder cancer quality of care in Canada: A consensus document reviewed and endorsed by Bladder Cancer	Ontario Cancer Registry (2009-2013)	Underuse (81.30%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
			cancer should receive neoadjuvant chemotherapy (NACT) after a radical cystectomy.	Canada (BCC), Canadian Urologic Oncology Group (CUOG), and Canadian Urological Association (CUA), December 2015. Can Urol Assoc J 2016;10: E46-80. https://doi.org/10.5489/cuaj.3583		
Silberberg, 2017	Therapeutics (Medications)	Multiple Medications (Cardiovascular) (Diabetes Mellitus)	Not explicitly stated in study; (from results, recommendation: patients with Atrial Fibrillation (AF) and Type II Diabetes should be prescribed an antiplatelet and/or anticoagulation therapy and a lipid-lowering drug).	Smith SC, Benjamin EJ, Bonow RO, Braun LT, Creager MA, Franklin BA, Gibbons RJ, Grundy SM, Hiratzka LF, Jones DW, LloydJones DM, Minissian M, Mosca L, Peterson ED, Sacco RL, Spertus J, Stein JH, Taubert KA. AHA/ACCF secondary prevention and risk reduction therapy for patients with coronary and other atherosclerotic vascular disease: 2011 update. A guideline from the American Heart Association and American College of Cardiology Foundation. J Am Coll Cardiol 2011; 58:2432e2446. Stone JA, Fitchett D, Grover S, Lewanczuk R, Lin P. Vascular protection in people with diabetes. Can J Diabetes 2013;37: S100eS104. McKelvie RS, Moe GW, Ezekowitz JA, Heckman GA, Costigan J, Ducharme A, Estrella-Holder E, Giannetti N, Grzeslo A, Harkness K, Howlett JG, Kouz S, Leblanc K, Mann E, Nigam A, O'Meara E, Rajda M, Steinhart B, Swiggum E, Le VV, Zieroth S, Arnold JM, Ashton T, D'Astous M, Dorian P, Haddad H, Isaac DL, Leblanc MH, Liu P, Rao V, Ross HJ, Sussex B. The 2012 Canadian Cardiovascular Society heart failure management guidelines update: focus on acute and chronic heart failure. Can J Cardiol 2013; 29:168e181. Campbell NRC, Poirier L, Tremblay G, Lindsay P, Reid D, Tobe SW. Canadian hypertension education program: the science supporting new 2011 CHEP recommendations with an emphasis on health advocacy and knowledge translation. Can J Cardiol 2011; 27:407e414. Abramson BL, Huckell V, Anand S, Forbes T, Gupta A, Harris K, Junaid A, Lindsay T, McAlister F,	Not specified (February 2011-September 2013)	Underuse (51.10%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				Roussin A, Saw J, Teo KK, Turpie AG, Verma S. Canadian Cardiovascular Society Consensus Conference: peripheral arterial disease - executive summary. Can J Cardiol 2005; 21:997e1006.		
Silberberg, 2017	Therapeutics (Medications)	Multiple Medications (Cardiovascular) (CVD)	Not explicitly stated in study; (from results, recommendation: patients with Atrial Fibrillation (AF) and heart failure should be prescribed an angiotensin-converting enzyme inhibitor (ACEi) and/or angiotensin receptor blocker (ARB)).	Smith SC, Benjamin EJ, Bonow RO, Braun LT, Creager MA, Franklin BA, Gibbons RJ, Grundy SM, Hiratzka LF, Jones DW, LloydJones DM, Minissian M, Mosca L, Peterson ED, Sacco RL, Spertus J, Stein JH, Taubert KA. AHA/ACCF secondary prevention and risk reduction therapy for patients with coronary and other atherosclerotic vascular disease: 2011 update. A guideline from the American Heart Association and American College of Cardiology Foundation. J Am Coll Cardiol 2011; 58:2432e2446. Stone JA, Fitchett D, Grover S, Lewanczuk R, Lin P. Vascular protection in people with diabetes. Can J Diabetes 2013;37: S100eS104. McKelvie RS, Moe GW, Ezekowitz JA, Heckman GA, Costigan J, Ducharme A, Estrella-Holder E, Giannetti N, Grzeslo A, Harkness K, Howlett JG, Kouz S, Leblanc K, Mann E, Nigam A, O'Meara E, Rajda M, Steinhart B, Swiggum E, Le VV, Zieroth S, Arnold JM, Ashton T, D'Astous M, Dorian P, Haddad H, Isaac DL, Leblanc MH, Liu P, Rao V, Ross HJ, Sussex B. The 2012 Canadian Cardiovascular Society heart failure management guidelines update: focus on acute and chronic heart failure. Can J Cardiol 2013; 29:168e181. Campbell NRC, Poirier L, Tremblay G, Lindsay P, Reid D, Tobe SW. Canadian hypertension education program: the science supporting new 2011 CHEP recommendations with an emphasis on health advocacy and knowledge translation. Can J Cardiol 2011; 27:407e414. Abramson BL, Huckell V, Anand S, Forbes T, Gupta A, Harris K, Junaid A, Lindsay T, McAlister F,	Not specified (February 2011-September 2013)	Underuse (59.80%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				Roussin A, Saw J, Teo KK, Turpie AG, Verma S. Canadian Cardiovascular Society Consensus Conference: peripheral arterial disease - executive summary. Can J Cardiol 2005; 21:997e1006.		
Silberberg, 2017	Therapeutics (Medications)	Multiple Medications (Cardiovascular) (Hypertension)	Not explicitly stated in study; (from results, recommendation: patients with Atrial Fibrillation (AF) and hypertension should be prescribed a ACEi and/or ARB, a lipid-lowering drug, and other antihypertensive therapies).	Smith SC, Benjamin EJ, Bonow RO, Braun LT, Creager MA, Franklin BA, Gibbons RJ, Grundy SM, Hiratzka LF, Jones DW, LloydJones DM, Minissian M, Mosca L, Peterson ED, Sacco RL, Spertus J, Stein JH, Taubert KA. AHA/ACCF secondary prevention and risk reduction therapy for patients with coronary and other atherosclerotic vascular disease: 2011 update. A guideline from the American Heart Association and American College of Cardiology Foundation. J Am Coll Cardiol 2011; 58:2432e2446. Stone JA, Fitchett D, Grover S, Lewanczuk R, Lin P. Vascular protection in people with diabetes. Can J Diabetes 2013;37: S100eS104. McKelvie RS, Moe GW, Ezekowitz JA, Heckman GA, Costigan J, Ducharme A, Estrella-Holder E, Giannetti N, Grzeslo A, Harkness K, Howlett JG, Kouz S, Leblanc K, Mann E, Nigam A, O'Meara E, Rajda M, Steinhart B, Swiggum E, Le VV, Zieroth S, Arnold JM, Ashton T, D'Astous M, Dorian P, Haddad H, Isaac DL, Leblanc MH, Liu P, Rao V, Ross HJ, Sussex B. The 2012 Canadian Cardiovascular Society heart failure management guidelines update: focus on acute and chronic heart failure. Can J Cardiol 2013; 29:168e181. Campbell NRC, Poirier L, Tremblay G, Lindsay P, Reid D, Tobe SW. Canadian hypertension education program: the science supporting new 2011 CHEP recommendations with an emphasis on health advocacy and knowledge translation. Can J Cardiol 2011; 27:407e414. Abramson BL, Huckell V, Anand S, Forbes T, Gupta A, Harris K, Junaid A, Lindsay T, McAlister F,	Not specified (February 2011-September 2013)	Underuse (3.30%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				Roussin A, Saw J, Teo KK, Turpie AG, Verma S. Canadian Cardiovascular Society Consensus Conference: peripheral arterial disease - executive summary. Can J Cardiol 2005; 21:997e1006.		
Silberberg, 2017	Therapeutics (Medications)	Multiple Medications (Cardiovascular) (CVD)	Not explicitly stated in study; (from results, recommendation: patients with Atrial Fibrillation (AF) and peripheral arterial disease (PAD) should be prescribed a beta-blocker, an ACEi and/or ARB, and antihypertensive therapy).	Smith SC, Benjamin EJ, Bonow RO, Braun LT, Creager MA, Franklin BA, Gibbons RJ, Grundy SM, Hiratzka LF, Jones DW, LloydJones DM, Minissian M, Mosca L, Peterson ED, Sacco RL, Spertus J, Stein JH, Taubert KA. AHA/ACCF secondary prevention and risk reduction therapy for patients with coronary and other atherosclerotic vascular disease: 2011 update. A guideline from the American Heart Association and American College of Cardiology Foundation. J Am Coll Cardiol 2011; 58:2432e2446. Stone JA, Fitchett D, Grover S, Lewanczuk R, Lin P. Vascular protection in people with diabetes. Can J Diabetes 2013;37: S100eS104. McKelvie RS, Moe GW, Ezekowitz JA, Heckman GA, Costigan J, Ducharme A, Estrella-Holder E, Giannetti N, Grzeslo A, Harkness K, Howlett JG, Kouz S, Leblanc K, Mann E, Nigam A, O'Meara E, Rajda M, Steinhart B, Swiggum E, Le VV, Zieroth S, Arnold JM, Ashton T, D'Astous M, Dorian P, Haddad H, Isaac DL, Leblanc MH, Liu P, Rao V, Ross HJ, Sussex B. The 2012 Canadian Cardiovascular Society heart failure management guidelines update: focus on acute and chronic heart failure. Can J Cardiol 2013; 29:168e181. Campbell NRC, Poirier L, Tremblay G, Lindsay P, Reid D, Tobe SW. Canadian hypertension education program: the science supporting new 2011 CHEP recommendations with an emphasis on health advocacy and knowledge translation. Can J Cardiol 2011; 27:407e414. Abramson BL, Huckell V, Anand S, Forbes T, Gupta A, Harris K, Junaid A, Lindsay T, McAlister F,	Not specified (February 2011-September 2013)	Underuse (44.90%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				Roussin A, Saw J, Teo KK, Turpie AG, Verma S. Canadian Cardiovascular Society Consensus Conference: peripheral arterial disease - executive summary. Can J Cardiol 2005; 21:997e1006.		
Silverman, 2017	Therapeutics (Medications)	Antimicrobials--medication(s) not specified (Nonbacterial Acute Upper Respiratory Infections)	Antibiotics should be prescribed for bacterial acute upper respiratory infections (AURIs); and should not be prescribed for nonbacterial acute upper respiratory infections (AURIs) including viral bronchitis, rhinosinusitis, and the common cold.	Hickner JM, Bartlett JG, Besser RE, Gonzales R, Hoffman JR, Sande MA; American Academy of Family Physicians. Principles of appropriate antibiotic use for acute rhinosinusitis in adults: background. Ann Intern Med. 2001; 134:498-505. [PMID: 11255528] Gonzales R, Bartlett JG, Besser RE, Cooper RJ, Hickner JM, Hoffman JR, et al. Principles of appropriate antibiotic use for treatment of acute respiratory tract infections in adults: background, specific aims, and methods. Ann Intern Med. 2001; 134:479-86. [PMID: 11255524] Harris AM, Hicks LA, Qaseem A; High Value Care Task Force of the American College of Physicians and for the Centers for Disease Control and Prevention. Appropriate antibiotic use for acute respiratory tract infection in adults: advice for high-value care from the American College of Physicians and the Centers for Disease Control and Prevention. Ann Intern Med. 2016; 164:425-34. [PMID: 26785402] doi:10.7326/M15-1840	Registered Persons Database;the Ontario Health Insurance Plan Database; theOntario Drug Benefit Database; the Canadian Institutefor Health Information Discharge Abstract Database;the National Ambulatory Care Reporting System Database; the ICES Physician Database; the Immigration, Refugees and Citizenship Canada Permanent ResidentDatabase; the Corporate Provider	Overuse (46.20%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
					Database; and theClient Agency Program Enrolment Database. (January 1, 2012-December 31, 2012)	
Simos, 2015	Diagnostics (Imaging)	Imaging-type not specified (Breast Cancer (Stage I))	Recommends no imaging for patients with stage I breast cancer and a bone scan for those with stage II breast cancer; Examples of types of imaging mentioned in 'discussion section' of study: thoracic radiography, thoracic CT, abdominal and pelvic imaging, ultrasonography, isotope bone scans, MRI, positron emission tomography; However, results do not specify the type of imaging.	Myers RE, Johnston M, Pritchard K, et al.; Breast Cancer Disease Site Group of the Cancer Care Ontario Practice Guidelines Initiative. Baseline staging tests in primary breast cancer: a practice guideline. CMAJ 2001; 164:1439-44. Clinical practice guideline BR-012 (version 2): staging investigations for asymptomatic and newly diagnosed breast cancer. Edmonton: Alberta Health Services; 2011 (revised 2012). Available: www.albertahealthservices.ca/hp/if-hp-cancer-guide-br012-staging-investigations.pdf (accessed 2015 May 8). Eastern Health Cancer Care clinical practice guidelines: staging of primary breast cancer. St. John's: Eastern Health; 2011. Available: www.easternhealth.ca/WebInWeb.aspx?d=4&id=1516&p=1495 (accessed 2015 May 8). Clinical practice guidelines in oncology: breast cancer (version 1). Fort Washington (PA): National Comprehensive Cancer Network: 2014. Available: www.nccn.org/professionals/physician_gls/pdf/breast.pdf (accessed 2015 May 8). Registration required to access content. Senkus E, Kyriakides S, Penault-Llorca F, et al. Primary breast cancer: ESMO clinical practice guidelines for diagnosis, treatment, and follow-up. Ann Oncol 2013;24 Suppl 6:vi7-23.	Ontario Cancer Registry; Institute of Clinical Evaluative Sciences (2007-2012)	Overuse (79.60%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
Singer, 2018	Therapeutics (Medications)	Antimicrobials (Bacterial Infections)	Prescriptions falling outside of evidence informed guidelines will be considered inappropriate and those within these guideline-based standards will be considered appropriate. Appropriate antimicrobial prescription codes were identified for each listed group 1 diagnosis according to Infectious Diseases Society of America (IDSA), Canadian Pediatric Society, and American Academy of Pediatrics guideline-based standards.	Gupta K, Hooton TM, Naber KG et al.; Infectious Diseases Society of America; European Society for Microbiology and Infectious Diseases. International clinical practice guidelines for the treatment of acute uncomplicated cystitis and pyelonephritis in women: a 2010 update by the Infectious Diseases Society of America and the European Society for Microbiology and Infectious Diseases. Clin Infect Dis 2011; 52: e103–20. Subcommittee on Urinary Tract Infection, Steering Committee on Quality Improvement and Management. Urinary tract infection: clinical practice guidelines for the diagnosis and management of the initial UTI in febrile infants and children 2 to 24 months. Pediatrics 2011; 128: 595–610. Robinson J, Finlay J, Lang M, Bortolussi R. Urinary tract infection in infants and children: diagnosis and management. Paediatr Child Health 2014; 19: 315–319. Shulman ST, Bisno AL, Clegg HW et al. Clinical practice guideline for the diagnosis and management of group A streptococcal pharyngitis: 2012 update by the Infectious Diseases Society of America. Clin Infect Dis 2012; 55: 1279–82. Stevens D, Bisno A, Chambers H et al. Practice guidelines for the diagnosis and management of skin and soft tissue infections: 2014 update by the Infectious Diseases Society of America. Clin Infect Dis 2014; 59: 147–59. Le Saux N, Robinson JL; Canadian Paediatric Society, Infectious Diseases and Immunization Committee. Uncomplicated pneumonia in healthy Canadian children and youth: practice points for management. Paediatr Child Health 2015; 20: 441 50.	Manitoba Primary Care Research Network repository (June 30, 2013 - June 30, 2015; 2009 - 2016)	Underuse (3.80%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				Mandell LA, Wunderink RG, Anzueto A et al.; Infectious Diseases Society of America; American Thoracic Society. Infectious Diseases Society of America/American Thoracic Society consensus guidelines on the management of community-acquired pneumonia in adults. Clin Infect Dis 2007; 44 (suppl 2): S27–72.		
Singer, 2018	Therapeutics (Medications)	Antimicrobials--medication(s) not specified (Antimicrobial (antimicrobial prescription-overuse of total prescriptions for bacterial infections))	'Group 1' consisted of bacterial infections (i.e. urinary tract infection (UTI), pharyngitis, skin/soft tissue infection, cellulitis and pneumonia), for which an antimicrobial prescription was likely indicated. Group 1 diagnosis, were deemed potentially inappropriate if they fell outside of the following evidence-informed guidelines: Infectious Diseases Society of America, Canadian Pediatric Society and American Academy of Pediatrics' guideline-based standards.	Gupta K, Hooton TM, Naber KG et al.; Infectious Diseases Society of America; European Society for Microbiology and Infectious Diseases. International clinical practice guidelines for the treatment of acute uncomplicated cystitis and pyelonephritis in women: a 2010 update by the Infectious Diseases Society of America and the European Society for Microbiology and Infectious Diseases. Clin Infect Dis 2011; 52: e103–20. Subcommittee on Urinary Tract Infection, Steering Committee on Quality Improvement and Management. Urinary tract infection: clinical practice guidelines for the diagnosis and management of the initial UTI in febrile infants and children 2 to 24 months. Pediatrics 2011; 128: 595–610. Robinson J, Finlay J, Lang M, Bortolussi R. Urinary tract infection in infants and children: diagnosis and management. Paediatr Child Health 2014; 19: 315–319. Shulman ST, Bisno AL, Clegg HW et al. Clinical practice guideline for the diagnosis and management of group A streptococcal pharyngitis: 2012 update by the Infectious Diseases Society of America. Clin Infect Dis 2012; 55: 1279–82. Stevens D, Bisno A, Chambers H et al. Practice guidelines for the diagnosis and management of skin and soft tissue infections: 2014 update by the Infectious Diseases Society of America. Clin Infect Dis 2014; 59: 147–59.	Manitoba Primary Care Research Network repository (June 30, 2013 - June 30, 2015; 2009 - 2016)	Overuse (53.70%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				Le Saux N, Robinson JL; Canadian Paediatric Society, Infectious Diseases and Immunization Committee. Uncomplicated pneumonia in healthy Canadian children and youth: practice points for management. Paediatr Child Health 2015; 20: 441 50. Mandell LA, Wunderink RG, Anzueto A et al.; Infectious Diseases Society of America; American Thoracic Society. Infectious Diseases Society of America/American Thoracic Society consensus guidelines on the management of community-acquired pneumonia in adults. Clin Infect Dis 2007; 44 (suppl 2): S27–72.		
Singer, 2018	Therapeutics (Medications)	Antimicrobials--medication(s) not specified (Various Bacterial Infections (pneumonia, urinary tract infection, pharyngitis, cellulitis))	'Group 1' consisted of bacterial infections (i.e., urinary tract infection (UTI), pharyngitis, skin/soft tissue infection, cellulitis, and pneumonia), for which an antimicrobial prescription was likely indicated. Group 1 diagnosis, were deemed potentially inappropriate if they fell outside of the following evidence-informed guidelines: Infectious Diseases Society of America, Canadian Pediatric Society and American Academy of Pediatrics' guideline-based standards.	Gupta K, Hooton TM, Naber KG et al.; Infectious Diseases Society of America; European Society for Microbiology and Infectious Diseases. International clinical practice guidelines for the treatment of acute uncomplicated cystitis and pyelonephritis in women: a 2010 update by the Infectious Diseases Society of America and the European Society for Microbiology and Infectious Diseases. Clin Infect Dis 2011; 52: e103–20. Subcommittee on Urinary Tract Infection, Steering Committee on Quality Improvement and Management. Urinary tract infection: clinical practice guidelines for the diagnosis and management of the initial UTI in febrile infants and children 2 to 24 months. Pediatrics 2011; 128: 595–610. Robinson J, Finlay J, Lang M, Bortolussi R. Urinary tract infection in infants and children: diagnosis and management. Paediatr Child Health 2014; 19: 315–319. Shulman ST, Bisno AL, Clegg HW et al. Clinical practice guideline for the diagnosis and management of group A streptococcal pharyngitis: 2012 update by	Manitoba Primary Care Research Network repository (June 30, 2013 - June 30, 2015; 2009 - 2016)	Overuse (57.50%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				the Infectious Diseases Society of America. Clin Infect Dis 2012; 55: 1279–82. Stevens D, Bisno A, Chambers H et al. Practice guidelines for the diagnosis and management of skin and soft tissue infections: 2014 update by the Infectious Diseases Society of America. Clin Infect Dis 2014; 59: 147–59. Le Saux N, Robinson JL; Canadian Paediatric Society, Infectious Diseases and Immunization Committee. Uncomplicated pneumonia in healthy Canadian children and youth: practice points for management. Paediatr Child Health 2015; 20: 441 50. Mandell LA, Wunderink RG, Anzueto A et al.; Infectious Diseases Society of America; American Thoracic Society. Infectious Diseases Society of America/American Thoracic Society consensus guidelines on the management of community-acquired pneumonia in adults. Clin Infect Dis 2007; 44 (suppl 2): S27–72.		
Singer, 2018	Therapeutics (Medications)	Antimicrobials--medication(s) not specified (Viral Infections)	'Group 2' consisted of encounters with a diagnosis of a viral infection (i.e., acute sinusitis, acute laryngitis and trachealis, upper respiratory tract infection, bronchitis, acute rhinitis, nasopharyngitis and influenza) that typically do not require an antimicrobial.	Gupta K, Hooton TM, Naber KG et al.; Infectious Diseases Society of America; European Society for Microbiology and Infectious Diseases. International clinical practice guidelines for the treatment of acute uncomplicated cystitis and pyelonephritis in women: a 2010 update by the Infectious Diseases Society of America and the European Society for Microbiology and Infectious Diseases. Clin Infect Dis 2011; 52: e103–20. Subcommittee on Urinary Tract Infection, Steering Committee on Quality Improvement and Management. Urinary tract infection: clinical practice guidelines for the diagnosis and management of the initial UTI in febrile infants and children 2 to 24 months. Pediatrics 2011; 128: 595–610.	Manitoba Primary Care Research Network repository (June 30, 2013 - June 30, 2015; 2009 - 2016)	Overuse (12.60%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				Robinson J, Finlay J, Lang M, Bortolussi R. Urinary tract infection in infants and children: diagnosis and management. Paediatr Child Health 2014; 19: 315–319. Shulman ST, Bisno AL, Clegg HW et al. Clinical practice guideline for the diagnosis and management of group A streptococcal pharyngitis: 2012 update by the Infectious Diseases Society of America. Clin Infect Dis 2012; 55: 1279–82. Stevens D, Bisno A, Chambers H et al. Practice guidelines for the diagnosis and management of skin and soft tissue infections: 2014 update by the Infectious Diseases Society of America. Clin Infect Dis 2014; 59: 147–59. Le Saux N, Robinson JL; Canadian Paediatric Society, Infectious Diseases and Immunization Committee. Uncomplicated pneumonia in healthy Canadian children and youth: practice points for management. Paediatr Child Health 2015; 20: 441 50. Mandell LA, Wunderink RG, Anzueto A et al.; Infectious Diseases Society of America; American Thoracic Society. Infectious Diseases Society of America/American Thoracic Society consensus guidelines on the management of community-acquired pneumonia in adults. Clin Infect Dis 2007; 44 (suppl 2): S27–72.		
Skiffington, 2020	Therapeutics (Acute care procedures)	Caesarean delivery (Pregnant Women)	Guideline recommends that a caesarean section is performed due to a failed induction of labour: Failure to generate regular (e.g., every 3 minutes) contractions and cervical change after at least 24 hours of	American College of Obstetricians and Gynecologists, Society for MaternalFetal Medicine. Obstetric care consensus no. 1: safe prevention of the primary caesarean delivery. Obstet Gynecol 2014; 123:693–711. Spong CY, Berghella V, Wenstrom KD, et al. Preventing the first cesarean delivery: summary of a joint Eunice Kennedy Shriver National Institute of Child Health and Human Development, Society for	Alberta Perinatal Health Program database (2007-2016)	Overuse (69.00%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
			oxytocin administration, with artificial membrane rupture if feasible.	Maternal-Fetal Medicine, and American College of Obstetricians and Gynecologists Workshop. Obstet Gynecol 2012; 120:1181–93		
Skiffington, 2020	Therapeutics (Acute care procedures)	Caesarean delivery (Pregnant Women)	Guideline recommends that a caesarean section is performed during a second stage arrest: No progress (descent or rotation) for ≥4 hours in primiparous women with epidural analgesia or ≥3 hours in primiparous women without epidural analgesia.	American College of Obstetricians and Gynecologists, Society for MaternalFetal Medicine. Obstetric care consensus no. 1: safe prevention of the primary caesarean delivery. Obstet Gynecol 2014; 123:693–711. Spong CY, Berghella V, Wenstrom KD, et al. Preventing the first cesarean delivery: summary of a joint Eunice Kennedy Shriver National Institute of Child Health and Human Development, Society for Maternal-Fetal Medicine, and American College of Obstetricians and Gynecologists Workshop. Obstet Gynecol 2012; 120:1181–93	Alberta Perinatal Health Program database (2007-2016)	Overuse (55.40%)
Skiffington, 2020	Therapeutics (Acute care procedures)	Caesarean delivery (Pregnant Women)	Guideline recommends that a caesarean section is performed due to a first stage arrest: ≥6 cm dilatation with membrane rupture and no cervical change for ≥4 hours of adequate contractions or ≥6 hours if contractions are inadequate.	American College of Obstetricians and Gynecologists, Society for MaternalFetal Medicine. Obstetric care consensus no. 1: safe prevention of the primary caesarean delivery. Obstet Gynecol 2014; 123:693–711. Spong CY, Berghella V, Wenstrom KD, et al. Preventing the first cesarean delivery: summary of a joint Eunice Kennedy Shriver National Institute of Child Health and Human Development, Society for Maternal-Fetal Medicine, and American College of Obstetricians and Gynecologists Workshop. Obstet Gynecol 2012; 120:1181–93	Alberta Perinatal Health Program database (2007-2016)	Overuse (45.40%)
Skiffington, 2020	Therapeutics (Acute care procedures)	Caesarean delivery (Pregnant Women)	Guideline recommends that a caesarean section is performed due to a failed induction of labour: Failure to generate regular (e.g., every 3 minutes) contractions and cervical change after at least 24 hours of	American College of Obstetricians and Gynecologists, Society for MaternalFetal Medicine. Obstetric care consensus no. 1: safe prevention of the primary caesarean delivery. Obstet Gynecol 2014; 123:693–711. Spong CY, Berghella V, Wenstrom KD, et al. Preventing the first cesarean delivery: summary of a joint Eunice Kennedy Shriver National Institute of Child Health and Human Development, Society for	Alberta Perinatal Health Program database (2007-2016)	Overuse (21.70%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
			oxytocin administration, with artificial membrane rupture if feasible.	Maternal-Fetal Medicine, and American College of Obstetricians and Gynecologists Workshop. Obstet Gynecol 2012; 120:1181–93		
Snodgrass, 2014	Diagnostics (Screening)	Papanicolaou (Pap) test (Cervical Cancer (Screening))	Recommended "strongly against" asymptomatic women under the age of 20 being screened for cervical cancer with Papanicolaou (Pap) tests. Recommended "weakly against" asymptomatic women aged 20 to 24 being screened for cervical cancer with Papanicolaou (Pap) tests. Recommended that cervical cancer screening may cease in women 70 years of age or older who have undergone adequate screening with Papanicolaou (Pap) tests. (i.e., 3 successive negative Pap test results in the preceding 10 years).	International Agency for Research on Cancer. European guidelines for quality assurance in cervical cancer screening. 2nd ed. Lyon, France: The Agency; 2008. Canadian Task Force on Preventive Health Care. Recommendations on screening for cervical cancer. CMAJ 2013; 185:35–45.	Laboratory Information System of Calgary Laboratory Services (February 2013 - May 2013)	Overuse (14.20%)
Solbak, 2018	Therapeutics (Acute care procedures)	Endoscopy (Colorectal Cancer)	Recommendation for individuals in the average-risk category due to age: Endoscopy (sigmoidoscopy or colonoscopy) screening every 2 years; Age 50-74 years	Canadian Task Force on Preventive Health Care. Colorectal cancer screening. Recommendation statement from the Canadian task force on preventive health care. CMAJ. 2001; 165:206–8. Toward Optimized Practice (TOP) Working Group for Colorectal Cancer Screening. Colorectal cancer screening: clinical practice guideline. Edmonton: Toward Optimized Practice; 2008. Available from: http://www.topalbertadoctors.org.	N/A (January 1, 2008-December 31, 2008)	Underuse (65.30%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				Toward Optimized Practice (TOP) Working Group for Colorectal Cancer Screening. Colorectal cancer screening: clinical practice guideline. Edmonton: Toward Optimized Practice; 2013. Available from: http://www.topalbertadoctors.org. Canadian Task Force on Preventive Health Care, Bacchus CM, Dunfield L, Gorber SC, Holmes NM, Birtwhistle R, et al. Recommendations on screening for colorectal cancer in primary care. CMAJ. 2016; 188:340–8.		
Solbak, 2018	Diagnostics (Screening)	Fecal Occult Blood Test (Colorectal Cancer (screening))	Recommendation for individuals in the average-risk category due to age: Fecal occult blood test (FOBT) screening every 2 years; Age 50-74 years.	Canadian Task Force on Preventive Health Care. Colorectal cancer screening. Recommendation statement from the Canadian task force on preventive health care. CMAJ. 2001; 165:206–8. Toward Optimized Practice (TOP) Working Group for Colorectal Cancer Screening. Colorectal cancer screening: clinical practice guideline. Edmonton: Toward Optimized Practice; 2008. Available from: http://www.topalbertadoctors.org. Toward Optimized Practice (TOP) Working Group for Colorectal Cancer Screening. Colorectal cancer screening: clinical practice guideline. Edmonton: Toward Optimized Practice; 2013. Available from: http://www.topalbertadoctors.org. Canadian Task Force on Preventive Health Care, Bacchus CM, Dunfield L, Gorber SC, Holmes NM, Birtwhistle R, et al. Recommendations on screening for colorectal cancer in primary care. CMAJ. 2016; 188:340–8.	N/A (January 1, 2008-December 31, 2008)	Underuse (66.10%)
Somanader, 2017	Therapeutics (Medications)	ACE Inhibitors OR ARB (Cardiovascular Disease)	Recommended that patients are prescribed angiotensin-converting enzyme inhibitor (ACE-I) or angiotensin receptor blocker (ARB)	Canadian Cardiovascular Society. Quality project. http://www.ccs.ca/en/health-policy/programs-and-initiatives/qualityproject. Accessed August 5, 2016.	Not specified (July 2010 - February 2014)	Underuse (48.20%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
			at cardiovascular rehabilitation program discharge.	Tu JV, Abrahamyan L, Donovan LR, Boom N. Best practices for developing cardiovascular quality indicators. Can J Cardiol. 2013;29(11):1516-1519. Grace SL, Poirier P, Norris CM, Oakes GH, Somanader DS, Suskin N. Pan-Canadian development of cardiac rehabilitation and secondary prevention quality indicators. Can J Cardiol. 2014;30(8):945-948.		
Somanader, 2017	Therapeutics (Medications)	Acetylsalicylic Acid (CVD)	Recommended that patients are prescribed Acetylsalicylic acid (ASA) at cardiovascular rehabilitation program discharge.	Canadian Cardiovascular Society. Quality project. http://www.ccs.ca/en/health-policy/programs-and-initiatives/qualityproject. Accessed August 5, 2016. Tu JV, Abrahamyan L, Donovan LR, Boom N. Best practices for developing cardiovascular quality indicators. Can J Cardiol. 2013;29(11):1516-1519. Grace SL, Poirier P, Norris CM, Oakes GH, Somanader DS, Suskin N. Pan-Canadian development of cardiac rehabilitation and secondary prevention quality indicators. Can J Cardiol. 2014;30(8):945-948.	Not specified (July 2010 - February 2014)	Underuse (30.00%)
Somanader, 2017	Therapeutics (Medications)	Antiplatelet Therapy (CVD)	Recommended that patients are prescribed antiplatelet agents other than ASA at cardiovascular rehabilitation program discharge.	Canadian Cardiovascular Society. Quality project. http://www.ccs.ca/en/health-policy/programs-and-initiatives/qualityproject. Accessed August 5, 2016. Tu JV, Abrahamyan L, Donovan LR, Boom N. Best practices for developing cardiovascular quality indicators. Can J Cardiol. 2013;29(11):1516-1519. Grace SL, Poirier P, Norris CM, Oakes GH, Somanader DS, Suskin N. Pan-Canadian development of cardiac rehabilitation and secondary prevention quality indicators. Can J Cardiol. 2014;30(8):945-948.	Not specified (July 2010 - February 2014)	Underuse (66.50%)
Somanader, 2017	Therapeutics (Medications)	Beta-blocker (CVD)	Recommended that patients are prescribed Beta-Blockers at	Canadian Cardiovascular Society. Quality project. http://www.ccs.ca/en/health-policy/programs-and-initiatives/qualityproject. Accessed August 5, 2016.	Not specified (July 2010 -	Underuse (30.10%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
			cardiovascular rehabilitation program discharge.	Tu JV, Abrahamyan L, Donovan LR, Boom N. Best practices for developing cardiovascular quality indicators. Can J Cardiol. 2013;29(11):1516-1519. Grace SL, Poirier P, Norris CM, Oakes GH, Somanader DS, Suskin N. Pan-Canadian development of cardiac rehabilitation and secondary prevention quality indicators. Can J Cardiol. 2014;30(8):945-948.	February 2014)	
Somanader, 2017	Diagnostics (Assessments)	Blood Pressure (Cardiac Rehabilitation)	Recommended that an assessment of blood pressure be completed for patients in a cardiovascular rehabilitation program.	Canadian Cardiovascular Society. Quality project. http://www.ccs.ca/en/health-policy/programs-and-initiatives/qualityproject. Accessed August 5, 2016. Tu JV, Abrahamyan L, Donovan LR, Boom N. Best practices for developing cardiovascular quality indicators. Can J Cardiol. 2013;29(11):1516-1519. Grace SL, Poirier P, Norris CM, Oakes GH, Somanader DS, Suskin N. Pan-Canadian development of cardiac rehabilitation and secondary prevention quality indicators. Can J Cardiol. 2014;30(8):945-948.	Not specified (July 2010 - February 2014)	Underuse (1.90%)
Somanader, 2017	Diagnostics (Assessments)	Body Mass Index (Cardiac Rehabilitation)	Recommended that an assessment of adiposity be completed for patients in a cardiovascular rehabilitation program.	Canadian Cardiovascular Society. Quality project. http://www.ccs.ca/en/health-policy/programs-and-initiatives/qualityproject. Accessed August 5, 2016. Tu JV, Abrahamyan L, Donovan LR, Boom N. Best practices for developing cardiovascular quality indicators. Can J Cardiol. 2013;29(11):1516-1519. Grace SL, Poirier P, Norris CM, Oakes GH, Somanader DS, Suskin N. Pan-Canadian development of cardiac rehabilitation and secondary prevention quality indicators. Can J Cardiol. 2014;30(8):945-948.	Not specified (July 2010 - February 2014)	Underuse (12.20%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
Somanader, 2017	Therapeutics (Psychosocial Therapy)	Counselling-Exercise/Active Living (CVD)	Recommended that patients in a cardiovascular rehabilitation program are encouraged to increase their exercise capacity.	Canadian Cardiovascular Society. Quality project. http://www.ccs.ca/en/health-policy/programs-and-initiatives/qualityproject. Accessed August 5, 2016. Tu JV, Abrahamyan L, Donovan LR, Boom N. Best practices for developing cardiovascular quality indicators. Can J Cardiol. 2013;29(11):1516-1519. Grace SL, Poirier P, Norris CM, Oakes GH, Somanader DS, Suskin N. Pan-Canadian development of cardiac rehabilitation and secondary prevention quality indicators. Can J Cardiol. 2014;30(8):945-948.	Not specified (July 2010 - February 2014)	Underuse (30.90%)
Somanader, 2017	Therapeutics (Psychosocial Therapy)	Counselling-Self-management Heart Disease (CVD)	Recommended that patients in a cardiovascular rehabilitation program receive self-management education.	Canadian Cardiovascular Society. Quality project. http://www.ccs.ca/en/health-policy/programs-and-initiatives/qualityproject. Accessed August 5, 2016. Tu JV, Abrahamyan L, Donovan LR, Boom N. Best practices for developing cardiovascular quality indicators. Can J Cardiol. 2013;29(11):1516-1519. Grace SL, Poirier P, Norris CM, Oakes GH, Somanader DS, Suskin N. Pan-Canadian development of cardiac rehabilitation and secondary prevention quality indicators. Can J Cardiol. 2014;30(8):945-948.	Not specified (July 2010 - February 2014)	Underuse (9.20%)
Somanader, 2017	Therapeutics (Psychosocial Therapy)	Counselling-Smoking Cessation (CVD)	Recommended that patients in a cardiovascular rehabilitation program are provided with smoking cessation support.	Canadian Cardiovascular Society. Quality project. http://www.ccs.ca/en/health-policy/programs-and-initiatives/qualityproject. Accessed August 5, 2016. Tu JV, Abrahamyan L, Donovan LR, Boom N. Best practices for developing cardiovascular quality indicators. Can J Cardiol. 2013;29(11):1516-1519. Grace SL, Poirier P, Norris CM, Oakes GH, Somanader DS, Suskin N. Pan-Canadian development of cardiac rehabilitation and secondary prevention quality indicators. Can J Cardiol. 2014;30(8):945-948.	Not specified (July 2010 - February 2014)	Underuse (33.30%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
Somanader, 2017	Therapeutics (Psychosocial Therapy)	Counselling-Stress Management (CVD)	Recommended that patients in a cardiovascular rehabilitation program receive a stress management intervention.	Canadian Cardiovascular Society. Quality project. http://www.ccs.ca/en/health-policy/programs-and-initiatives/qualityproject. Accessed August 5, 2016. Tu JV, Abrahamyan L, Donovan LR, Boom N. Best practices for developing cardiovascular quality indicators. Can J Cardiol. 2013;29(11):1516-1519. Grace SL, Poirier P, Norris CM, Oakes GH, Somanader DS, Suskin N. Pan-Canadian development of cardiac rehabilitation and secondary prevention quality indicators. Can J Cardiol. 2014;30(8):945-948.	Not specified (July 2010 - February 2014)	Underuse (18.70%)
Somanader, 2017	Diagnostics (Multiple Blood Tests)	Lipids (Various tests - e.g., total cholesterol, HDL, LDL, triglycerides) (Cardiac Rehabilitation)	Recommended that an assessment of lipids be completed for patients in a cardiovascular rehabilitation program.	Canadian Cardiovascular Society. Quality project. http://www.ccs.ca/en/health-policy/programs-and-initiatives/qualityproject. Accessed August 5, 2016. Tu JV, Abrahamyan L, Donovan LR, Boom N. Best practices for developing cardiovascular quality indicators. Can J Cardiol. 2013;29(11):1516-1519. Grace SL, Poirier P, Norris CM, Oakes GH, Somanader DS, Suskin N. Pan-Canadian development of cardiac rehabilitation and secondary prevention quality indicators. Can J Cardiol. 2014;30(8):945-948.	Not specified (July 2010 - February 2014)	Underuse (47.00%)
Somanader, 2017	Therapeutics (Medications)	Statins- Drug Unknown (CVD)	Recommended that patients are presribed statins at cardiovascular rehabilitation program discharge.	Canadian Cardiovascular Society. Quality project. http://www.ccs.ca/en/health-policy/programs-and-initiatives/qualityproject. Accessed August 5, 2016. Tu JV, Abrahamyan L, Donovan LR, Boom N. Best practices for developing cardiovascular quality indicators. Can J Cardiol. 2013;29(11):1516-1519. Grace SL, Poirier P, Norris CM, Oakes GH, Somanader DS, Suskin N. Pan-Canadian development of cardiac rehabilitation and secondary	Not specified (July 2010 - February 2014)	Underuse (25.80%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				prevention quality indicators. Can J Cardiol. 2014;30(8):945-948.		
Somanader, 2017	Diagnostics (Blood tests)	Fasting blood glucose (Cardiac Rehabilitation)	Recommended that an assessment of blood glucose be completed for patients in a cardiovascular rehabilitation program.	Canadian Cardiovascular Society. Quality project. http://www.ccs.ca/en/health-policy/programs-and-initiatives/qualityproject. Accessed August 5, 2016. Tu JV, Abrahamyan L, Donovan LR, Boom N. Best practices for developing cardiovascular quality indicators. Can J Cardiol. 2013;29(11):1516-1519. Grace SL, Poirier P, Norris CM, Oakes GH, Somanader DS, Suskin N. Pan-Canadian development of cardiac rehabilitation and secondary prevention quality indicators. Can J Cardiol. 2014;30(8):945-948.	Not specified (July 2010 - February 2014)	Underuse (57.90%)
Soril, 2019	Therapeutics (Biophysical Therapy)	Red Blood Cell (RBC) Transfusions (Not Specified)	Red Blood Cell (RBC) transfusions are not recommended above a hemoglobin level of 70 g/L.	Carson JL, Guyatt G, Heddle NM, Grossman BJ, Cohn CS, Fung MK, et al. Clinical practice guidelines from the AABB: red blood cell transfusion thresholds and storage. JAMA. 2016;316(19):2025–35. Carson JL, Stanworth SJ, Roubinian N, Fergusson DA, Triulzi D, Doree C, et al. Transfusion thresholds and other strategies for guiding allogeneic red blood cell transfusion. Cochrane Database Syst Rev. 2016;10: Cd002042. Choosing Wisely. The Choosing Wisely Lists: choosing wisely, an initiative of the American Board of Internal Medicine 2017 2016. Available from: http://www.choosingwisely.org/clinician-lists/. Accessed 5 Oct 2018. Carson JL, Grossman BJ, Kleinman S, Tinmouth AT, Marques MB, Fung MK, et al. Red blood cell transfusion: a clinical practice guideline from the AABB. Ann Intern Med. 2012;157(1):49–58.	eCritical Alberta; Canadian Institute for Health Information Discharge Abstract Database (April 1, 2014 - December 31, 2016)	Overuse (61.00%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
Spradbrow, 2016	Therapeutics (Biophysical Therapy)	Red Blood Cell (RBC) Transfusions (Not Specified)	Criteria used to adjudicate appropriate Red Blood Cell (RBC) transfusions: Hemoglobin (Hb) pre-transfusion less than or equal to 50; Asymptomatic; Not bleeding; Iron deficiency (MCV <75 fL and previously normal or ferritin <30 mg/L) and age 50 years.	Callum JL, Waters JH, Shaz BH, Sloan SR, Murphy MF. The AABB recommendations for the Choosing Wisely campaign of the American Board of Internal Medicine. Transfusion 2014; 54:2344-52.	Electronic patient records; Ontario Regional Blood Coordinating Network Web-based RBCtransfusion audit tool (April 1, 2015-July 1, 2015)	Overuse (22.00%)
Srigley, 2013	Therapeutics (Medications)	Antimicrobials--medication(s) not specified (Clostridium Difficile Infection)	Inappropriate antibiotic use was defined as the following: incorrect diagnosis of infection or continuation of empiric antibiotic therapy after bacterial infection had been ruled out; spectrum of activity not consistent with guideline recommendations, or therapy not de-escalated once culture and sensitivity results were documented; or excessive or insufficient duration of therapy.	Infectious Diseases Society of America. IDSA practice guidelines (Internet). Arlington: Infectious Diseases Society of America; c2013. Available from: http://www.idsociety.org/IDSA_Practice_Guidelines/. Accessed April 3, 2013.	Hamilton Health Sciences Hospitals (June 1, 2011-May 31, 2012)	Overuse (73.80%)
Steinberg, 2020	Therapeutics (Biophysical Therapy)	Implantable Cardioverter Defibrillator (CVD)	Not explicitly provided in study; from results, recommendation: Patients received appropriate primary prevention Implantable Cardioverter-Defibrillator (ICD) Programming for all	Bennett M, Parkash R, Nery P, et al. Canadian Cardiovascular Society/Canadian Heart Rhythm Society 2016 implantable cardioverter defibrillator guidelines. Can J Cardiol 2017; 33:174-88. Al-Khatib SM, Stevenson WG, Ackerman MJ, et al. 2017 AHA/ACC/HRS guideline for management of patients with ventricular arrhythmias and the prevention of sudden cardiac death: executive	Canadian Tertiary University Centres (January 2016-April 2019)	Underuse (27.00%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
			primary-prevention ICDs and secondary prevention ICDs related to ventricular fibrillation, polymorphic ventricular tachycardia (VT), or torsades de pointes.	summary: a report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines and the Heart Rhythm Society. Heart Rhythm 2018;15: e190-252. Simpson C, Ross D, Dorian P, et al. CCS Consensus Conference 2003: Assessment of the cardiac patient for fitness to drive and fly executive summary. Can J Cardiol 2004; 20:1313-23. Task Force Members, Vijgen J, Botto G, Camm J, et al. Consensus statement of the European Heart Rhythm Association: updated recommendations for driving by patients with implantable cardioverter defibrillators. Europace 2009; 11:1097-107. Epstein AE, Baessler CA, Curtis AB, et al. Addendum to "Personal and public safety issues related to arrhythmias that may affect consciousness: implications for regulation and physician recommendations: a medical/ scientific statement from the American Heart Association and the North American Society of Pacing and Electrophysiology": public safety issues in patients with implantable defibrillators: a scientific statement from the American Heart Association and the Heart Rhythm Society. Circulation 2007; 115:1170-6. Kim MH, Zhang Y, Sakaguchi S, Goldberger JJ; OMNI Study Investigators. Time course of appropriate implantable cardioverter defibrillator therapy and implications for guideline-based driving restrictions. Heart Rhythm 2015; 12:1728-36. Philippon F, Sterns LD, Nery PB, et al. Management of implantable cardioverter defibrillator recipients: care beyond guidelines. Can J Cardiol 2017; 33:977-90. Wilkoff BL, Fauchier L, Stiles MK, et al. 2015 HRS/EHRA/APHRS/SOLAECE expert consensus		

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				statement on optimal implantable cardioverter-defibrillator programming and testing. Heart Rhythm 2016;13: e50-86.		
Sun, 2015	Diagnostics (Assessments)	Pulmonary Function Test (Non-cardiothoracic Surgery)	Guidelines recommend that patients should not undergo preoperative PFT (simple spirometry, flow-volume loop, lung compliance, carbon monoxide diffusion capacity, or bronchial provocative studies) within 60 days before surgery.	Carson JL, Guyatt G, Heddle NM, Grossman BJ, Cohn CS, Fung MK, et al. Clinical practice guidelines from the AABB: red blood cell transfusion thresholds and storage. JAMA. 2016;316(19):2025–35. Carson JL, Stanworth SJ, Roubinian N, Fergusson DA, Triulzi D, Doree C, et al. Transfusion thresholds and other strategies for guiding allogeneic red blood cell transfusion. Cochrane Database Syst Rev. 2016;10: Cd002042. Choosing Wisely. The Choosing Wisely Lists: choosing wisely, an initiative of the American Board of Internal Medicine 2017 2016. Available from: http://www.choosingwisely.org/clinician-lists/. Accessed 5 Oct 2018. Carson JL, Grossman BJ, Kleinman S, Tinmouth AT, Marques MB, Fung MK, et al. Red blood cell transfusion: a clinical practice guideline from the AABB. Ann Intern Med. 2012;157(1):49–58.	Population-based administrative databases (April 1, 2003 - March 31, 2013)	Overuse (3.00%)
Symonds, 2018	Diagnostics (Screening)	Papanicolaou (Pap) test (Cervical Cancer (Screening))	Guidelines do not recommend routine screening with Papanicolaou (Pap) tests for women under 21 years of age or over 69 years of age. Guidelines do not recommend routine screening with Papanicolaou (Pap) tests for women under 21 years of age or over 69 years of age.	Choosing Wisely Canada. Family medicine. Eleven things physicians and patients should question. Toronto, ON: Choosing Wisely Canada; 2017. Available from: www.choosingwiselycanada.org/recommendations/family-medicine/. Accessed 2017 Nov 9. Saslow D, Solomon D, Lawson HW, Killackey M, Kulasingam SL, Cain J, et al. American Cancer Society, American Society for Colposcopy and Cervical Pathology, and American Society for Clinical Pathology screening guidelines for the prevention and early detection of cervical cancer. Am J Clin Pathol 2012;137(4):516-42.	Analytics and Performance Reporting Branch of the Alberta Ministry of Health (2011 - 2013)	Overuse (13.90%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				Moyer VA; U.S. Preventive Services Task Force. Screening for cervical cancer: U.S. Preventive Services Task Force recommendation statement. Ann Intern Med 2012;156(12):880-91, W312. Erratum in: Ann Intern Med 2013;158(11):852. Toward Optimized Practice. Alberta cervical cancer screening clinical practice guidelines. Edmonton, AB: Toward Optimized Practice; 2011. Available from: www. topalbertadoctors.org/download/578/Cervical%20cancer%20summary%20nov%20 2811.pdf?_20150318141415. Accessed 2017 Nov 24. Canadian Task Force on Preventive Health Care, Dickinson J, Tsakonas E, Conner Gorber S, Lewin G, Shaw E, et al. Recommendations on screening for cervical cancer. CMAJ 2013;185(1):35-45. Epub 2013 Jan 7.		
Taggar, 2016	Diagnostics (Referrals)	Radiation Oncologist (Prostate Cancer)	Patients with at least one high-risk feature should be referred to a radiation oncologist (RO) within 6-months of a radical prostatectomy	Morgan SC, Waldron TS, Eapen L, et al. Adjuvant radiotherapy following radical prostatectomy for pathologic T3 or margin-positive prostate cancer: A systematic review and meta-analysis. Radiother Oncol 2008; 88:1-9. http://dx.doi.org/10.1016/j.radonc.2008.04.013 Pickles T, Morgan S, Morton G, et al. Adjuvant radiotherapy following radical prostatectomy: Genitourinary Radiation Oncologists of Canada consensus statement. Can Urol Assoc J 2008; 2:95-9. Thompson IM, Valicenti RK, Albertsen P, et al. Adjuvant and salvage radiotherapy after prostatectomy: AUA/ASTRO guideline. J Urol 2013; 190:441-9. http://dx.doi.org/10.1016/j.juro.2013.05.032	N/A (2012)	Underuse (20.60%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				Freedland SJ, Rumble RB, Finelli A, et al. Adjuvant and salvage radiotherapy after prostatectomy: American Society of Clinical Oncology clinical practice guideline endorsement. J Clin Oncol 2014; 32:3892-8. http://dx.doi.org/10.1200/JCO.2014.58.8525		
Teoh, 2013	Therapeutics (Psychosocial Therapy)	Counselling-Exercise/Active Living (Elevated Cardiometabolic Risk)	Health behaviour modification is recommended as the primary treatment strategy for the management of cardiometabolic risk and should include simultaneous counselling regarding physical activity, smoking cessation, caloric intake, and diet composition, as these are associated with improvements on all cardiometabolic risk factors.	Leiter LA, Fitchett DH, Gilbert RE, et al. Identification and management of cardiometabolic risk in Canada: a position paper by the cardiometabolic risk working group (executive summary). Can J Cardiol 2011; 27:124-31. Leiter LA, Fitchett DH, Gilbert RE, et al. Cardiometabolic risk in Canada: a detailed analysis and position paper by the cardiometabolic risk working group. Can J Cardiol 2011;27: e1-33. Canadian Diabetes Association Clinical Practice Guidelines Expert Committee. Canadian Diabetes Association 2008 clinical practice guidelines for the prevention and management of diabetes in Canada. Can J Diabetes 2008;32: S1-201. Genest J, McPherson R, Frohlich J, et al. 2009 Canadian Cardiovascular Society/Canadian guidelines for the diagnosis and treatment of dyslipidemia and prevention of cardiovascular disease in the adult 2009 recommendations. Can J Cardiol 2009; 25:567-79. Daskalopoulou SS, Khan NA, Quinn RR, et al. The 2012 Canadian Hypertension Education Program recommendations for the management of hypertension: blood pressure measurement, diagnosis, assessment of risk, and therapy. Can J Cardiol 2012; 28:270-87. Tobe SW, Stone JA, Brouwers M, Bhattacharyya O, Walker KM, Dawes M, et al. Harmonization of guidelines for the prevention and treatment of	Not specified (April 2011 - March 2012)	Underuse (85.90%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				cardiovascular disease: the C-CHANGE Initiative. CMAJ 2011;183: E1135-50. Lau DC, Douketis JD, Morrison KM, Hramiak IM, Sharma AM, Ur E. 2006 Canadian clinical practice guidelines on the management and prevention of obesity in adults and children (summary). CMAJ 2007;176: S1-13. D'Agostino RB Sr, Vasan RS, Pencina MJ, et al. General cardiovascular risk profile for use in primary care: the Framingham Heart Study. Circulation 2008; 117:743-53. US Preventive Services Task Force. Screening for and Management of Obesity in Adults: US Preventive Services Task Force Recommendation. Ann Intern Med 2012; 157:373-8.		
Teoh, 2013	Therapeutics (Psychosocial Therapy)	Counselling-Nutrition (Elevated Cardiometabolic Risk)	Health behaviour modification is recommended as the primary treatment strategy for the management of cardiometabolic risk and should include simultaneous counselling regarding physical activity, smoking cessation, caloric intake, and diet composition, as these are associated with improvements on all cardiometabolic risk factors.	Leiter LA, Fitchett DH, Gilbert RE, et al. Identification and management of cardiometabolic risk in Canada: a position paper by the cardiometabolic risk working group (executive summary). Can J Cardiol 2011; 27:124-31. Leiter LA, Fitchett DH, Gilbert RE, et al. Cardiometabolic risk in Canada: a detailed analysis and position paper by the cardiometabolic risk working group. Can J Cardiol 2011;27: e1-33. Canadian Diabetes Association Clinical Practice Guidelines Expert Committee. Canadian Diabetes Association 2008 clinical practice guidelines for the prevention and management of diabetes in Canada. Can J Diabetes 2008;32: S1-201. Genest J, McPherson R, Frohlich J, et al. 2009 Canadian Cardiovascular Society/Canadian guidelines for the diagnosis and treatment of dyslipidemia and prevention of cardiovascular	Not specified (April 2011 - March 2012)	Underuse (54.20%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				disease in the adult 2009 recommendations. Can J Cardiol 2009; 25:567-79. Daskalopoulou SS, Khan NA, Quinn RR, et al. The 2012 Canadian Hypertension Education Program recommendations for the management of hypertension: blood pressure measurement, diagnosis, assessment of risk, and therapy. Can J Cardiol 2012; 28:270-87. Tobe SW, Stone JA, Brouwers M, Bhattacharyya O, Walker KM, Dawes M, et al. Harmonization of guidelines for the prevention and treatment of cardiovascular disease: the C-CHANGE Initiative. CMAJ 2011;183: E1135-50. Lau DC, Douketis JD, Morrison KM, Hramiak IM, Sharma AM, Ur E. 2006 Canadian clinical practice guidelines on the management and prevention of obesity in adults and children (summary). CMAJ 2007;176: S1-13. D'Agostino RB Sr, Vasan RS, Pencina MJ, et al. General cardiovascular risk profile for use in primary care: the Framingham Heart Study. Circulation 2008; 117:743-53. US Preventive Services Task Force. Screening for and Management of Obesity in Adults: US Preventive Services Task Force Recommendation. Ann Intern Med 2012; 157:373-8.		
Teoh, 2013	Therapeutics (Psychosocial Therapy)	Counselling-Smoking Cessation (Elevated Cardiometabolic Risk)	Health behaviour modification is recommended as the primary treatment strategy for the management of cardiometabolic risk and should include simultaneous	Leiter LA, Fitchett DH, Gilbert RE, et al. Identification and management of cardiometabolic risk in Canada: a position paper by the cardiometabolic risk working group (executive summary). Can J Cardiol 2011; 27:124-31. Leiter LA, Fitchett DH, Gilbert RE, et al. Cardiometabolic risk in Canada: a detailed analysis	Not specified (April 2011 - March 2012)	Underuse (9.20%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
			counselling regarding physical activity, smoking cessation, caloric intake, and diet composition, as these are associated with improvements on all cardiometabolic risk factors.	and position paper by the cardiometabolic risk working group. Can J Cardiol 2011;27: e1-33. Canadian Diabetes Association Clinical Practice Guidelines Expert Committee. Canadian Diabetes Association 2008 clinical practice guidelines for the prevention and management of diabetes in Canada. Can J Diabetes 2008;32: S1-201. Genest J, McPherson R, Frohlich J, et al. 2009 Canadian Cardiovascular Society/Canadian guidelines for the diagnosis and treatment of dyslipidemia and prevention of cardiovascular disease in the adult 2009 recommendations. Can J Cardiol 2009; 25:567-79. Daskalopoulou SS, Khan NA, Quinn RR, et al. The 2012 Canadian Hypertension Education Program recommendations for the management of hypertension: blood pressure measurement, diagnosis, assessment of risk, and therapy. Can J Cardiol 2012; 28:270-87. Tobe SW, Stone JA, Brouwers M, Bhattacharyya O, Walker KM, Dawes M, et al. Harmonization of guidelines for the prevention and treatment of cardiovascular disease: the C-CHANGE Initiative. CMAJ 2011;183: E1135-50. Lau DC, Douketis JD, Morrison KM, Hramiak IM, Sharma AM, Ur E. 2006 Canadian clinical practice guidelines on the management and prevention of obesity in adults and children (summary). CMAJ 2007;176: S1-13. D'Agostino RB Sr, Vasan RS, Pencina MJ, et al. General cardiovascular risk profile for use in primary care: the Framingham Heart Study. Circulation 2008; 117:743-53.		

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				US Preventive Services Task Force. Screening for and Management of Obesity in Adults: US Preventive Services Task Force Recommendation. Ann Intern Med 2012; 157:373-8.		
Teoh, 2013	Therapeutics (Medications)	Statins- Drug Unknown (Elevated Cardiometabolic Risk)	In patients with cardiometabolic risk with a moderate or high Framingham Risk Score, treatment should be initiated with a statin to reduce low-density lipoprotein cholesterol (LDL-C) by at least 50% and to less than or equal to 2.0 mmol/L.	Leiter LA, Fitchett DH, Gilbert RE, et al. Identification and management of cardiometabolic risk in Canada: a position paper by the cardiometabolic risk working group (executive summary). Can J Cardiol 2011; 27:124-31. Leiter LA, Fitchett DH, Gilbert RE, et al. Cardiometabolic risk in Canada: a detailed analysis and position paper by the cardiometabolic risk working group. Can J Cardiol 2011;27: e1-33. Canadian Diabetes Association Clinical Practice Guidelines Expert Committee. Canadian Diabetes Association 2008 clinical practice guidelines for the prevention and management of diabetes in Canada. Can J Diabetes 2008;32: S1-201. Genest J, McPherson R, Frohlich J, et al. 2009 Canadian Cardiovascular Society/Canadian guidelines for the diagnosis and treatment of dyslipidemia and prevention of cardiovascular disease in the adult 2009 recommendations. Can J Cardiol 2009; 25:567-79. Daskalopoulou SS, Khan NA, Quinn RR, et al. The 2012 Canadian Hypertension Education Program recommendations for the management of hypertension: blood pressure measurement, diagnosis, assessment of risk, and therapy. Can J Cardiol 2012; 28:270-87. Tobe SW, Stone JA, Brouwers M, Bhattacharyya O, Walker KM, Dawes M, et al. Harmonization of guidelines for the prevention and treatment of cardiovascular disease: the C-CHANGE Initiative. CMAJ 2011;183: E1135-50.	Not specified (April 2011 - March 2012)	Underuse (18.50%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				Lau DC, Douketis JD, Morrison KM, Hramiak IM, Sharma AM, Ur E. 2006 Canadian clinical practice guidelines on the management and prevention of obesity in adults and children (summary). CMAJ 2007;176: S1-13. D'Agostino RB Sr, Vasan RS, Pencina MJ, et al. General cardiovascular risk profile for use in primary care: the Framingham Heart Study. Circulation 2008; 117:743-53. US Preventive Services Task Force. Screening for and Management of Obesity in Adults: US Preventive Services Task Force Recommendation. Ann Intern Med 2012; 157:373-8.		
Teoh, 2013	Diagnostics (Assessments)	Waist circumference (Elevated Cardiometabolic Risk)	Not provided in study; (from results, recommendation: Health behaviour modification is recommended as the primary treatment strategy for the management of cardiometabolic risk and should include assessment of waist circumference prior to counselling on health behaviour modifications).	Leiter LA, Fitchett DH, Gilbert RE, et al. Identification and management of cardiometabolic risk in Canada: a position paper by the cardiometabolic risk working group (executive summary). Can J Cardiol 2011; 27:124-31. Leiter LA, Fitchett DH, Gilbert RE, et al. Cardiometabolic risk in Canada: a detailed analysis and position paper by the cardiometabolic risk working group. Can J Cardiol 2011;27: e1-33. Canadian Diabetes Association Clinical Practice Guidelines Expert Committee. Canadian Diabetes Association 2008 clinical practice guidelines for the prevention and management of diabetes in Canada. Can J Diabetes 2008;32: S1-201. Genest J, McPherson R, Frohlich J, et al. 2009 Canadian Cardiovascular Society/Canadian guidelines for the diagnosis and treatment of dyslipidemia and prevention of cardiovascular disease in the adult 2009 recommendations. Can J Cardiol 2009; 25:567-79.	Not specified (April 2011 - March 2012)	Underuse (53.00%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				Daskalopoulou SS, Khan NA, Quinn RR, et al. The 2012 Canadian Hypertension Education Program recommendations for the management of hypertension: blood pressure measurement, diagnosis, assessment of risk, and therapy. Can J Cardiol 2012; 28:270-87. Tobe SW, Stone JA, Brouwers M, Bhattacharyya O, Walker KM, Dawes M, et al. Harmonization of guidelines for the prevention and treatment of cardiovascular disease: the C-CHANGE Initiative. CMAJ 2011;183: E1135-50. Lau DC, Douketis JD, Morrison KM, Hramiak IM, Sharma AM, Ur E. 2006 Canadian clinical practice guidelines on the management and prevention of obesity in adults and children (summary). CMAJ 2007;176: S1-13. D'Agostino RB Sr, Vasan RS, Pencina MJ, et al. General cardiovascular risk profile for use in primary care: the Framingham Heart Study. Circulation 2008; 117:743-53. US Preventive Services Task Force. Screening for and Management of Obesity in Adults: US Preventive Services Task Force Recommendation. Ann Intern Med 2012; 157:373-8.		
Teoh, 2013	Diagnostics (Screening)	CVD Screening (Elevated Cardiometabolic Risk)	Clinical practice guidelines recommend that cardiovascular risk and cardiometabolic risk (CMR) be calculated annually in individuals who are 40 years of age or older. Total cardiovascular risk calculations performed at the coordinating centre	Leiter LA, Fitchett DH, Gilbert RE, et al. Identification and management of cardiometabolic risk in Canada: a position paper by the cardiometabolic risk working group (executive summary). Can J Cardiol 2011; 27:124-31. Leiter LA, Fitchett DH, Gilbert RE, et al. Cardiometabolic risk in Canada: a detailed analysis and position paper by the cardiometabolic risk working group. Can J Cardiol 2011;27: e1-33.	Not specified (April 2011 - March 2012)	Overuse (51.00%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
			were based on the sex-specific Framingham Risk Score (FRS) formula, which takes into account age, high density lipoprotein, and total cholesterol levels, systolic blood pressure, and if the individual is a smoker and has T2DM.	Canadian Diabetes Association Clinical Practice Guidelines Expert Committee. Canadian Diabetes Association 2008 clinical practice guidelines for the prevention and management of diabetes in Canada. Can J Diabetes 2008;32: S1-201. Genest J, McPherson R, Frohlich J, et al. 2009 Canadian Cardiovascular Society/Canadian guidelines for the diagnosis and treatment of dyslipidemia and prevention of cardiovascular disease in the adult 2009 recommendations. Can J Cardiol 2009; 25:567-79. Daskalopoulou SS, Khan NA, Quinn RR, et al. The 2012 Canadian Hypertension Education Program recommendations for the management of hypertension: blood pressure measurement, diagnosis, assessment of risk, and therapy. Can J Cardiol 2012; 28:270-87. Tobe SW, Stone JA, Brouwers M, Bhattacharyya O, Walker KM, Dawes M, et al. Harmonization of guidelines for the prevention and treatment of cardiovascular disease: the C-CHANGE Initiative. CMAJ 2011;183: E1135-50. Lau DC, Douketis JD, Morrison KM, Hramiak IM, Sharma AM, Ur E. 2006 Canadian clinical practice guidelines on the management and prevention of obesity in adults and children (summary). CMAJ 2007;176: S1-13. D'Agostino RB Sr, Vasan RS, Pencina MJ, et al. General cardiovascular risk profile for use in primary care: the Framingham Heart Study. Circulation 2008; 117:743-53. US Preventive Services Task Force. Screening for and Management of Obesity in Adults: US Preventive Services Task Force Recommendation. Ann Intern Med 2012; 157:373-8.		

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
Tharmaratnam, 2020	Diagnostics (Imaging)	Transthoracic Echocardiogram (Trans-thoracic Echocardiogram (TTE) (transthoracic echocardiogram (TTE)))	Not explicitly provided in study; from results, recommendation: Patients received a 'rarely-appropriate' (rA) transthoracic echocardiogram (TTEs).	American College of Cardiology Foundation Appropriate Use Criteria Task Force; American Society of Echocardiography; American Heart Association; American Society of Nuclear Cardiology; Heart Failure Society of America; Heart Rhythm Society; Society for Cardiovascular Angiography and Interventions; Society of Critical Care Medicine; Society of Cardiovascular Computed Tomography; Society for Cardiovascular Magnetic Resonance, Douglas PS, Garcia MJ, Haines DE, Lai WW, Manning WJ, Patel AR, Picard MH, Polk DM, Ragosta M, Ward RP, Weiner RB. ACCF/ASE/AHA/ASNC/HFSA/HRS/SCAI/SCCM/ SCCT/SCMR 2011 appropriate use criteria for echocardiography: a report of the American College of Cardiology Foundation Appropriate Use Criteria Task Force, American Heart Association, American Society of Nuclear Cardiology, Heart Failure Society of America, Heart Rhythm Society, Society for Cardiovascular Angiography and Interventions, Society of Critical Care Medicine, Society of Cardiovascular Computed Tomography, and Society for Cardiovascular Magnetic Resonance endorsed by the American College of Chest Physicians. J Am Coll Cardiol. 2011; 57:1126–1166. Bhatia RS, Carne DM, Picard MH, Weiner RB. Comparison of the 2007 and 2011 appropriate use criteria for transthoracic echocardiography in various clinical settings. J Am Soc Echocardiogr. 2012; 25:1162–1169.	The Echo WISELY trial database; The Ontario Health Insurance Plan database; The Registered Persons Database (September 2014-May 2016)	Overuse (13.80%)
Thomas, 2020	*Therapeutics (Multiple medication results)*	Potentially Inappropriate Medications-medications not specified (Studies of Potentially Inappropriate Medications)	Not explicitly provided in study; from results, recommendation: Appropriate medications were prescribed in accordance to American Geriatric Society (AGS)	Masnoon, N.; Shakib, S.; Kalisch-Ellett, L.; Caughey, G.E. What is polypharmacy? A systematic review of definitions. BMC Geriatr. 2017, 17, 230. [CrossRef] [PubMed] Leelakanok, N.; Holcombe, A.L.; Lund, B.C.; Gu, X.; Schweizer, M.L. Association between polypharmacy and death: A systematic review and meta-analysis. J.	Alberta Health Services registration database and the Pharmaceutical Information	Overuse (82.00%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
			Potentially Inappropriate Medications (PIMs).	Am. Pharm. Assoc. 2017, 57, 729–738. [CrossRef] [PubMed] Thomas, R.E.; Thomas, B.C. A systematic review of studies of the STOPP/START 2015 and American Geriatric Society Beers 2015 criteria. Curr. Aging Sci. 2019, 12, 121–154. [CrossRef] The American Geriatrics Society Beers Criteria Update Expert Panel. American Geriatrics Society 2019 Updated AGS Beers Criteria(R) for Potentially Inappropriate Medication Use in Older Adults. J. Am.Geriatr. Soc. 2019, 67, 674–694. O'Mahony, D.; O'Sullivan, D.; Byrne, S.; O'Connor, M.M.; Ryan, C.; Gallagher, P. STOPP/START criteria for potentially inappropriate prescribing in older people: Version 2. Age Ageing 2015, 44, 213–218. [CrossRef]	Network through the Alberta Health Service's Data Integration, Management, and Reporting database; Foothills Medical Centre; Rockyview General Hospital; Peter Lougheed Centre; South Health Campus (March 1, 2013-February 28, 2018)	
Tinmouth, 2013	Therapeutics (Biophysical Therapy)	Frozen Plasma Transfusion (Not Specified)	Frozen plasma transfused not in accordance to guidelines, specific inappropriate indications include: 1) INR 1.1—1.5 pre-transfusion/ normal PTT (and normal post-procedure if available). Irrespective of bleeding status or procedure status; 2) Reversal of coagulation defect due to warfarin or vitamin K deficiency. Absence of bleeding; 3) Reversal of	Expert Working Group. Guidelines for red blood cell and plasma transfusion for adults and children. CMAJ 1997; 156:1-23. Consensus conference. Fresh-frozen plasma. Indications and risks. JAMA 1985; 253:551-3. Practice parameter for the use of fresh-frozen plasma, cryoprecipitate, and platelets. Fresh-Frozen Plasma, Cryoprecipitate, and Platelets Administration Practice Guidelines Development Task Force of the College of American Pathologists. JAMA 1994; 271:777-81. O'Shaughnessy DF, Atterbury C, Bolton Maggs P, Murphy M, Thomas D, Yates S, Williamson LM; British Committee for Standards in Haematology, Blood Transfusion Task Force. Guidelines for the use	Hospitals within 'The Ontario Regional Blood Coordinating Network' (September 22, 2008-October 19, 2008)	Overuse (28.60%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
			coagulation defect other than warfarin or vitamin K or heparin. Pre- or post- transfusion INR>1.5 and/or PTT>1x upper limit of normal and no bleeding or surgery/procedure; 4) Heparin reversal (regardless of INR) ; 5) INR 1.0 pre-transfusion/normal PTT (and normal post-procedure if available) irrespective of bleeding status or procedure status; 6) Volume replacement.	of fresh-frozen plasma, cryoprecipitate and cryosupernatant. Br J Haematol 2004; 126:11-28. National Health and Medical Research Council/Australasian Society of Blood Transfusion. Clinical practice guidelines on the use of blood components— (red blood cells, platelets, fresh frozen plasma, cryoprecipitate). 2001. [cited 2012 Jan 25]. Available from: URL: http://www.nhmrc.gov.au/guidelines/publications/cp78 Practice guidelines for blood component therapy: a report by the American Society of Anesthesiologists Task Force on Blood Component Therapy. Anesthesiology 1996; 84:732-47. Roback JD, Caldwell S, Carson J, Davenport R, Drew MJ, Eder A, Fung M, Hamilton M, Hess JR, Luban N, Perkins JG, Sachais BS, Shander A, Silverman T, Snyder E, Tormey C, Waters J, Djulbegovic B; American Association for the Study of Liver; American Academy of Pediatrics; United States Army; American Society of Anesthesiology; American Society of Hematology. Evidence-based practice guidelines for plasma transfusion. Transfusion 2010; 50:1227-39.		
Trenaman, 2018	Therapeutics (Medications)	Antipsychotics-medication(s) not specified (Studies of Potentially Inappropriate Medications)	STOPP (Screening Tool of Older Persons' Potentially Inappropriate Prescriptions) criteria does not recommend the use of antipsychotics in older adults with a history of falls.	O'Mahony D, O'Sullivan D, Byrne S, O'Connor MN, Ryan C , Gallagher P . STOPP/START criteria for potentially inappropriate prescribing in older people: version 2. Age Ageing. 2015 Mar;44(2):213–218. Dyer SM, Harrison SL, Laver K, Whitehead C, Crotty M . An overview of sys- tematic reviews of pharmacological and non-pharmacological interventions for the treatment of behavioral and psychological symptoms of dementia. Int Psy-chogeriatr. 2017 Nov; 16:1–15.	Nova Scotia Seniors' Pharmacare Program Database; Canadian Institute of Health Information Discharge Abstract Database	Overuse (76.50%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				Schroeck JL, Ford J , Conway EL , Kurtzhalts KE , GeeME , VollmerKA , etal. Re- view of Safety and Efficacy of Sleep Medicines in Older Adults. Clin Ther. 2016 Nov;38(11):2340–2372. Alberta Health Services. Clinical Indications for Prescribing Antipsychotic Med- ication. 2016. Available from https://www.albertahealthservices.ca/assets/about/scn/ahs- scn- srs- aua- prescribing- antipsychotic.pdf. Society Alzheimer's. Drugs for behavioral and psychological symptoms. United against Dementia. 2018. Available from https://www.alzheimers.org.uk/sites/default/files/pdf/factsheet _ drugs _ used _ to _ relieve _ behavioural _ and _ psychological _ symptoms _ in _ dementia.pdf. Prime Minister's challenge on dementia 2020. 2015. Available from https://www.gov.uk/government/publications/prime-ministers- challenge- on- dementia-2020. Alexopoulos GS, Streim J, Carpenter D, Docherty JP. Expert Consensus Panel for Using Antipsychotic Drugs in Older Patients. Using antipsychotic agents in older patients. J Clin Psychiatry. 2004;65 Suppl 2:5,99.	(April 1, 2009 - March 31, 2013)	
Verma, 2020	Therapeutics (Acute care procedures)	Peripherally Inserted Central Catheters (Not Specified)	Overall inappropriate PICC placement based on the following conditions: 1) Infused Medications-Placement for any indication other than infusion of non–peripherally compatible infusates when the proposed duration of use is ≤5 days (Inappropriate). No	Chopra V, Flanders SA, Saint S, et al. The Michigan appropriateness guide for intravenous catheters (MAGIC): Results from a multispecialty panel using the RAND/UCLA Appropriateness Method. Ann Intern Med. 2015;163(6): S1-S39. doi:10.7326/M15-0744	Canadian Institute for Health Information Discharge Abstract Database (April 1, 2010-March 31, 2015)	Overuse (16.50%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
			intravenous medication delivery in hospital after PICC placement and duration of PICC use or hospitalization of ≤5 days after PICC placement was considered "inappropriate. 2) Critical Illness- Invasive hemodynamic monitoring or requirement to obtain central venous access in critically ill patient with proposed duration <15 days (Inappropriate) <15 days between the date of PICC placement in the ICU and date of transfer out of the ICU was considered "inappropriate" based on the MAGIC preference statement that temporary central venous catheters are preferred to PICC in this context. PICC use was not considered inappropriate if use after ICU discharge was appropriate for infusion of non-peripherally compatible infusates on a medical ward, infusion of peripherally compatible infusates for ≥6 days, or frequent phlebotomy for ≥6 days. 3) Phlebotomy			

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
			Frequency-Placement for any indication other than infusion of non–peripherally compatible infusates (e.g., irritants or vesicants) when the proposed duration of use is ≤5 days (Inappropriate). Both frequent and non-frequent phlebotomy for ≤5 days after PICC placement was considered "inappropriate" if patients were not also receiving nonperipherally compatible infusates. 4) Chronic Kidney Disease Stage-Placement in a patient with stage 3b or worse chronic kidney disease (estimated glomerular filtration rate ≤44 mL/min) or in patients currently receiving renal replacement therapy via any modality (Inappropriate). PICC placement in patients with eGFR > ≤44 mL/min or receiving dialysis was considered 'inappropriate'.			
Vinturache, 2017	Therapeutics (Psychosocial Therapy)	Counselling-Prenatal Care (weight gain, smoking, alcohol, working during	Guidelines recommend that women are counselled by a healthcare provider (HCP) on appropriate	Davies, G., Maxwell, C., Mcleod, L., Gagnon, R., Basso, M., Bos, H., et al. (2010). Sogc clinical practice guidelines: Obesity in pregnancy. No. 239, February 2010. International Journal of Gynecology & Obstetrics, 110, 167–173.	N/A (May 2008 - December 2010)	Underuse (32.20%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
		pregnancy, medications in pregnancy, vitamins and minerals, exercise/active living, and/or nutrition) (Prenatal)	weight gain during their pregnancy.	Davies, G., Maxwell, C., Mcleod, L., Gagnon, R., Basso, M., Bos, H., et al. (2010). Obesity in pregnancy. Journal of Obstetrics and Gynaecology Canada, 32(2), 165–173. World Health Organization. Obesity: Preventing and managing the global epidemic. report of a who consultation. 2000; 0512-3054 Contract No.: i–xii. Health Canada. (2003). Canadian guidelines for body weight classification in adults: Quick reference tool for professionals: Health Canada. Available December 15, 2013, from, http://Www.Hc-Sc.Gc.Ca/.		
Vinturache, 2017	Therapeutics (Psychosocial Therapy)	Counselling-Prenatal Care (weight gain, smoking, alcohol, working during pregnancy, medications in pregnancy, vitamins and minerals, exercise/active living, and/or nutrition) (Prenatal)	Guidelines recommend that women are counselled by a healthcare provider (HCP) on smoking (including risks of second hand smoke) during their pregnancy.	Davies, G., Maxwell, C., Mcleod, L., Gagnon, R., Basso, M., Bos, H., et al. (2010). Sogc clinical practice guidelines: Obesity in pregnancy. No. 239, February 2010. International Journal of Gynecology & Obstetrics, 110, 167–173. Davies, G., Maxwell, C., Mcleod, L., Gagnon, R., Basso, M., Bos, H., et al. (2010). Obesity in pregnancy. Journal of Obstetrics and Gynaecology Canada, 32(2), 165–173. World Health Organization. Obesity: Preventing and managing the global epidemic. report of a who consultation. 2000; 0512-3054 Contract No.: i–xii. Health Canada. (2003). Canadian guidelines for body weight classification in adults: Quick reference tool for professionals: Health Canada. Available December 15, 2013, from, http://Www.Hc-Sc.Gc.Ca/.	N/A (May 2008 - December 2010)	Underuse (58.00%)
Vinturache, 2017	Therapeutics (Psychosocial Therapy)	Counselling-Prenatal Care (weight gain, smoking, alcohol, working during pregnancy,	Guidelines recommend that women are counselled by a healthcare provider (HCP) on alcohol	Davies, G., Maxwell, C., Mcleod, L., Gagnon, R., Basso, M., Bos, H., et al. (2010). Sogc clinical practice guidelines: Obesity in pregnancy. No. 239, February 2010. International Journal of Gynecology & Obstetrics, 110, 167–173.	N/A (May 2008 - December 2010)	Underuse (50.60%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
		medications in pregnancy, vitamins and minerals, exercise/active living, and/or nutrition) (Prenatal)	consumption during their pregnancy.	Davies, G., Maxwell, C., Mcleod, L., Gagnon, R., Basso, M., Bos, H., et al. (2010). Obesity in pregnancy. Journal of Obstetrics and Gynaecology Canada, 32(2), 165–173. World Health Organization. Obesity: Preventing and managing the global epidemic. report of a who consultation. 2000; 0512-3054 Contract No.: i–xii. Health Canada. (2003). Canadian guidelines for body weight classification in adults: Quick reference tool for professionals: Health Canada. Available December 15, 2013, from, http://Www.Hc-Sc.Gc.Ca/.		
Vinturache, 2017	Therapeutics (Psychosocial Therapy)	Counselling-Prenatal Care (weight gain, smoking, alcohol, working during pregnancy, medications in pregnancy, vitamins and minerals, exercise/active living, and/or nutrition) (Prenatal)	Guidelines recommend that women are counselled by a healthcare provider (HCP) on working during their pregnancy.	Davies, G., Maxwell, C., Mcleod, L., Gagnon, R., Basso, M., Bos, H., et al. (2010). Sogc clinical practice guidelines: Obesity in pregnancy. No. 239, February 2010. International Journal of Gynecology & Obstetrics, 110, 167–173. Davies, G., Maxwell, C., Mcleod, L., Gagnon, R., Basso, M., Bos, H., et al. (2010). Obesity in pregnancy. Journal of Obstetrics and Gynaecology Canada, 32(2), 165–173. World Health Organization. Obesity: Preventing and managing the global epidemic. report of a who consultation. 2000; 0512-3054 Contract No.: i–xii. Health Canada. (2003). Canadian guidelines for body weight classification in adults: Quick reference tool for professionals: Health Canada. Available December 15, 2013, from, http://Www.Hc-Sc.Gc.Ca/.	N/A (May 2008 - December 2010)	Underuse (50.10%)
Vinturache, 2017	Therapeutics (Psychosocial Therapy)	Counselling-Prenatal Care (weight gain, smoking, alcohol, working during pregnancy, medications in	Guidelines recommend that women are counselled by a healthcare provider (HCP) on nutrition during their pregnancy.	Davies, G., Maxwell, C., Mcleod, L., Gagnon, R., Basso, M., Bos, H., et al. (2010). Sogc clinical practice guidelines: Obesity in pregnancy. No. 239, February 2010. International Journal of Gynecology & Obstetrics, 110, 167–173.	N/A (May 2008 - December 2010)	Underuse (30.70%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
		pregnancy, vitamins and minerals, exercise/active living, and/or nutrition) (Prenatal)		Davies, G., Maxwell, C., Mcleod, L., Gagnon, R., Basso, M., Bos, H., et al. (2010). Obesity in pregnancy. Journal of Obstetrics and Gynaecology Canada, 32(2), 165–173. World Health Organization. Obesity: Preventing and managing the global epidemic. report of a who consultation. 2000; 0512-3054 Contract No.: i–xii. Health Canada. (2003). Canadian guidelines for body weight classification in adults: Quick reference tool for professionals: Health Canada. Available December 15, 2013, from, http://Www.Hc-Sc.Gc.Ca/.		
Vinturache, 2017	Therapeutics (Psychosocial Therapy)	Counselling-Prenatal Care (weight gain, smoking, alcohol, working during pregnancy, medications in pregnancy, vitamins and minerals, exercise/active living, and/or nutrition) (Prenatal)	Guidelines recommend that women are counselled by a healthcare provider (HCP) on alcohol consumption during their pregnancy.	Davies, G., Maxwell, C., Mcleod, L., Gagnon, R., Basso, M., Bos, H., et al. (2010). Sogc clinical practice guidelines: Obesity in pregnancy. No. 239, February 2010. International Journal of Gynecology & Obstetrics, 110, 167–173. Davies, G., Maxwell, C., Mcleod, L., Gagnon, R., Basso, M., Bos, H., et al. (2010). Obesity in pregnancy. Journal of Obstetrics and Gynaecology Canada, 32(2), 165–173. World Health Organization. Obesity: Preventing and managing the global epidemic. report of a who consultation. 2000; 0512-3054 Contract No.: i–xii. Health Canada. (2003). Canadian guidelines for body weight classification in adults: Quick reference tool for professionals: Health Canada. Available December 15, 2013, from, http://Www.Hc-Sc.Gc.Ca/.	N/A (May 2008 - December 2010)	Underuse (35.60%)
Vinturache, 2017	Therapeutics (Psychosocial Therapy)	Counselling-Prenatal Care (weight gain, smoking, alcohol, working during pregnancy, medications in	Guidelines recommend that women are counselled by a healthcare provider (HCP) non-prescription and prescription drugs during their pregnancy.	Davies, G., Maxwell, C., Mcleod, L., Gagnon, R., Basso, M., Bos, H., et al. (2010). Sogc clinical practice guidelines: Obesity in pregnancy. No. 239, February 2010. International Journal of Gynecology & Obstetrics, 110, 167–173.	N/A (May 2008 - December 2010)	Underuse (37.80%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
		pregnancy, vitamins and minerals, exercise/active living, and/or nutrition) (Prenatal)		Davies, G., Maxwell, C., Mcleod, L., Gagnon, R., Basso, M., Bos, H., et al. (2010). Obesity in pregnancy. Journal of Obstetrics and Gynaecology Canada, 32(2), 165–173. World Health Organization. Obesity: Preventing and managing the global epidemic. report of a who consultation. 2000; 0512-3054 Contract No.: i–xii. Health Canada. (2003). Canadian guidelines for body weight classification in adults: Quick reference tool for professionals: Health Canada. Available December 15, 2013, from, http://Www.Hc-Sc.Gc.Ca/.		
Vinturache, 2017	Therapeutics (Psychosocial Therapy)	Counselling-Prenatal Care (weight gain, smoking, alcohol, working during pregnancy, medications in pregnancy, vitamins and minerals, exercise/active living, and/or nutrition) (Prenatal)	Guidelines recommend that women are counselled by a healthcare provider (HCP) on vitamin and mineral supplements during their pregnancy.	Davies, G., Maxwell, C., Mcleod, L., Gagnon, R., Basso, M., Bos, H., et al. (2010). Sogc clinical practice guidelines: Obesity in pregnancy. No. 239, February 2010. International Journal of Gynecology & Obstetrics, 110, 167–173. Davies, G., Maxwell, C., Mcleod, L., Gagnon, R., Basso, M., Bos, H., et al. (2010). Obesity in pregnancy. Journal of Obstetrics and Gynaecology Canada, 32(2), 165–173. World Health Organization. Obesity: Preventing and managing the global epidemic. report of a who consultation. 2000; 0512-3054 Contract No.: i–xii. Health Canada. (2003). Canadian guidelines for body weight classification in adults: Quick reference tool for professionals: Health Canada. Available December 15, 2013, from, http://Www.Hc-Sc.Gc.Ca/.	N/A (May 2008 - December 2010)	Underuse (13.90%)
Vinturache, 2019	Therapeutics (Psychosocial Therapy)	Counselling-Prenatal Care (weight gain, smoking, alcohol, working during pregnancy, medications in	Guidelines recommend that women are counselled by a healthcare provider (HCP) on appropriate weight gain during their pregnancy.	IOM (Institute of Medicine) and NRC (National Research Council). Weight Gain During Pregnancy: Reexamining the guidelines. Washington, DC: The National Academies Press; 2009.	N/A (May 2008 - December 2010)	Underuse (33.80%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
		pregnancy, vitamins and minerals, exercise/active living, and/or nutrition) (Prenatal)		ACOG. Committee Opinion number 315, September 2005. Obesity Pregnancy Obstet Gynecol. 2005;106(3):671–5. Prenatal Nutrition Guidelines for Health Professionals: Gestational Weight Gain 2010. https://www.canada.ca/en/health-canada/services/food-nutrition/healthy-eating/prenatal-nutrition/eating-well-being-active-towards-healthyweight-gain-pregnancy-2010.html. NICE Public Health Guidance 27. Weight management before, during and after pregnancy. 2010. https://www.nice.org.uk/guidance/ph27. Davies GA, Maxwell C, McLeod L, Gagnon R, Basso M, Bos H, et al. SOGC clinical practice guidelines: obesity in pregnancy. No. 239, February 2010. Int J Gynaecol Obstet. 2010;110(2):167–73.		
Vinturache, 2019	Therapeutics (Psychosocial Therapy)	Counselling-Prenatal Care (weight gain, smoking, alcohol, working during pregnancy, medications in pregnancy, vitamins and minerals, exercise/active living, and/or nutrition) (Prenatal)	Guidelines recommend that women are counselled by a healthcare provider (HCP) on smoking (including risks of second hand smoke) during their pregnancy.	IOM (Institute of Medicine) and NRC (National Research Council). Weight Gain During Pregnancy: Reexamining the guidelines. Washington, DC: The National Academies Press; 2009. ACOG. Committee Opinion number 315, September 2005. Obesity Pregnancy Obstet Gynecol. 2005;106(3):671–5. Prenatal Nutrition Guidelines for Health Professionals: Gestational Weight Gain 2010. https://www.canada.ca/en/health-canada/services/food-nutrition/healthy-eating/prenatal-nutrition/eating-well-being-active-towards-healthyweight-gain-pregnancy-2010.html. NICE Public Health Guidance 27. Weight management before, during and after pregnancy. 2010. https://www.nice.org.uk/guidance/ph27.	N/A (May 2008 - December 2010)	Underuse (58.90%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				Davies GA, Maxwell C, McLeod L, Gagnon R, Basso M, Bos H, et al. SOGC clinical practice guidelines: obesity in pregnancy. No. 239, February 2010. Int J Gynaecol Obstet. 2010;110(2):167–73.		
Vinturache, 2019	Therapeutics (Psychosocial Therapy)	Counselling-Prenatal Care (weight gain, smoking, alcohol, working during pregnancy, medications in pregnancy, vitamins and minerals, exercise/active living, and/or nutrition) (Prenatal)	Guidelines recommend that women are counselled by a healthcare provider (HCP) on alcohol consumption during their pregnancy.	IOM (Institute of Medicine) and NRC (National Research Council). Weight Gain During Pregnancy: Reexamining the guidelines. Washington, DC: The National Academies Press; 2009. ACOG. Committee Opinion number 315, September 2005. Obesity Pregnancy Obstet Gynecol. 2005;106(3):671–5. Prenatal Nutrition Guidelines for Health Professionals: Gestational Weight Gain 2010. https://www.canada.ca/en/health-canada/services/food-nutrition/healthy-eating/prenatal-nutrition/eating-well-being-active-towards-healthyweight-gain-pregnancy-2010.html. NICE Public Health Guidance 27. Weight management before, during and after pregnancy. 2010. https://www.nice.org.uk/guidance/ph27. Davies GA, Maxwell C, McLeod L, Gagnon R, Basso M, Bos H, et al. SOGC clinical practice guidelines: obesity in pregnancy. No. 239, February 2010. Int J Gynaecol Obstet. 2010;110(2):167–73.	N/A (May 2008 - December 2010)	Underuse (51.80%)
Vinturache, 2019	Therapeutics (Psychosocial Therapy)	Counselling-Prenatal Care (weight gain, smoking, alcohol, working during pregnancy, medications in pregnancy, vitamins and minerals, exercise/active	Guidelines recommend that women are counselled by a healthcare provider (HCP) on working during their pregnancy.	IOM (Institute of Medicine) and NRC (National Research Council). Weight Gain During Pregnancy: Reexamining the guidelines. Washington, DC: The National Academies Press; 2009. ACOG. Committee Opinion number 315, September 2005. Obesity Pregnancy Obstet Gynecol. 2005;106(3):671–5. Prenatal Nutrition Guidelines for Health Professionals: Gestational Weight Gain 2010.	N/A (May 2008 - December 2010)	Underuse (51.50%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
		living, and/or nutrition) (Prenatal)		https://www.canada.ca/en/health-canada/services/food-nutrition/healthy-eating/prenatal-nutrition/eating-well-being-active-towards-healthyweight-gain-pregnancy-2010.html. NICE Public Health Guidance 27. Weight management before, during and after pregnancy. 2010. https://www.nice.org.uk/guidance/ph27. Davies GA, Maxwell C, McLeod L, Gagnon R, Basso M, Bos H, et al. SOGC clinical practice guidelines: obesity in pregnancy. No. 239, February 2010. Int J Gynaecol Obstet. 2010;110(2):167–73.		
Vinturache, 2019	Therapeutics (Psychosocial Therapy)	Counselling-Prenatal Care (weight gain, smoking, alcohol, working during pregnancy, medications in pregnancy, vitamins and minerals, exercise/active living, and/or nutrition) (Prenatal)	Guidelines recommend that women are counselled by a healthcare provider (HCP) on nutrition during their pregnancy.	IOM (Institute of Medicine) and NRC (National Research Council). Weight Gain During Pregnancy: Reexamining the guidelines. Washington, DC: The National Academies Press; 2009. ACOG. Committee Opinion number 315, September 2005. Obesity Pregnancy Obstet Gynecol. 2005;106(3):671–5. Prenatal Nutrition Guidelines for Health Professionals: Gestational Weight Gain 2010. https://www.canada.ca/en/health-canada/services/food-nutrition/healthy-eating/prenatal-nutrition/eating-well-being-active-towards-healthyweight-gain-pregnancy-2010.html. NICE Public Health Guidance 27. Weight management before, during and after pregnancy. 2010. https://www.nice.org.uk/guidance/ph27. Davies GA, Maxwell C, McLeod L, Gagnon R, Basso M, Bos H, et al. SOGC clinical practice guidelines: obesity in pregnancy. No. 239, February 2010. Int J Gynaecol Obstet. 2010;110(2):167–73.	N/A (May 2008 - December 2010)	Underuse (30.50%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
Vinturache, 2019	Therapeutics (Psychosocial Therapy)	Counselling-Prenatal Care (weight gain, smoking, alcohol, working during pregnancy, medications in pregnancy, vitamins and minerals, exercise/active living, and/or nutrition) (Prenatal)	Guidelines recommend that women are counselled by a healthcare provider (HCP) on alcohol consumption during their pregnancy.	IOM (Institute of Medicine) and NRC (National Research Council). Weight Gain During Pregnancy: Reexamining the guidelines. Washington, DC: The National Academies Press; 2009. ACOG. Committee Opinion number 315, September 2005. Obesity Pregnancy Obstet Gynecol. 2005;106(3):671–5. Prenatal Nutrition Guidelines for Health Professionals: Gestational Weight Gain 2010. https://www.canada.ca/en/health-canada/services/food-nutrition/healthy-eating/prenatal-nutrition/eating-well-being-active-towards-healthyweight-gain-pregnancy-2010.html. NICE Public Health Guidance 27. Weight management before, during and after pregnancy. 2010. https://www.nice.org.uk/guidance/ph27. Davies GA, Maxwell C, McLeod L, Gagnon R, Basso M, Bos H, et al. SOGC clinical practice guidelines: obesity in pregnancy. No. 239, February 2010. Int J Gynaecol Obstet. 2010;110(2):167–73.	N/A (May 2008 - December 2010)	Underuse (37.30%)
Vinturache, 2019	Therapeutics (Psychosocial Therapy)	Counselling-Prenatal Care (weight gain, smoking, alcohol, working during pregnancy, medications in pregnancy, vitamins and minerals, exercise/active living, and/or nutrition) (Prenatal)	Guidelines recommend that women are counselled by a healthcare provider (HCP) on non-prescription and prescription drugs during their pregnancy.	IOM (Institute of Medicine) and NRC (National Research Council). Weight Gain During Pregnancy: Reexamining the guidelines. Washington, DC: The National Academies Press; 2009. ACOG. Committee Opinion number 315, September 2005. Obesity Pregnancy Obstet Gynecol. 2005;106(3):671–5. Prenatal Nutrition Guidelines for Health Professionals: Gestational Weight Gain 2010. https://www.canada.ca/en/health-canada/services/food-nutrition/healthy-eating/prenatal-nutrition/eating-well-being-active-towards-healthyweight-gain-pregnancy-2010.html.	N/A (May 2008 - December 2010)	Underuse (38.60%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				NICE Public Health Guidance 27. Weight management before, during and after pregnancy. 2010. https://www.nice.org.uk/guidance/ph27. Davies GA, Maxwell C, McLeod L, Gagnon R, Basso M, Bos H, et al. SOGC clinical practice guidelines: obesity in pregnancy. No. 239, February 2010. Int J Gynaecol Obstet. 2010;110(2):167–73.		
Vinturache, 2019	Therapeutics (Psychosocial Therapy)	Counselling-Prenatal Care (weight gain, smoking, alcohol, working during pregnancy, medications in pregnancy, vitamins and minerals, exercise/active living, and/or nutrition) (Prenatal)	Guidelines recommend that women are counselled by a healthcare provider (HCP) on vitamin and mineral supplements during their pregnancy.	IOM (Institute of Medicine) and NRC (National Research Council). Weight Gain During Pregnancy: Reexamining the guidelines. Washington, DC: The National Academies Press; 2009. ACOG. Committee Opinion number 315, September 2005. Obesity Pregnancy Obstet Gynecol. 2005;106(3):671–5. Prenatal Nutrition Guidelines for Health Professionals: Gestational Weight Gain 2010. https://www.canada.ca/en/health-canada/services/food-nutrition/healthy-eating/prenatal-nutrition/eating-well-being-active-towards-healthyweight-gain-pregnancy-2010.html. NICE Public Health Guidance 27. Weight management before, during and after pregnancy. 2010. https://www.nice.org.uk/guidance/ph27. Davies GA, Maxwell C, McLeod L, Gagnon R, Basso M, Bos H, et al. SOGC clinical practice guidelines: obesity in pregnancy. No. 239, February 2010. Int J Gynaecol Obstet. 2010;110(2):167–73.	N/A (May 2008 - December 2010)	Underuse (14.20%)
Vitale, 2020	Diagnostics (Laboratory tests (non-blood tests))	Albumin-to-Creatinine Ratio (Diabetes Mellitus)	Clinical practice guidelines recommend that diabetes care be delivered in accordance with the chronic care model (CCM); Not explicitly provided in	Diabetes Canada Clinical Practice Guidelines Expert Committee, Diabetes Canada, Clinical practice guidelines for the prevention and management of diabetes in Canada, Can. J. Diabetes 42 (Suppl 1) (2018) S1–S325.	Primary care sites across a Southern region of Ontario, Canada (Family health	Underuse (26.40%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
			study; from results, recommendation: patients received Annual Albumin/Creatinine Ratio (ACR).	American Diabetes Association. Improving care and promoting health in populations: standards of medical care in diabetes—2018, Diabetes Care 41 (Suppl 1) (2018) S7.	teams; family-medicine group practices; solo physicianpractice) (November 2009-August 2014)	
Vitale, 2020	Diagnostics (Assessments)	Blood Pressure (Diabetes Mellitus)	Clinical practice guidelines recommend that diabetes care be delivered in accordance with the chronic care model (CCM); from results, recommendation: patients received Blood Pressure (BP) assessment every 6 months.	Diabetes Canada Clinical Practice Guidelines Expert Committee, Diabetes Canada, Clinical practice guidelines for the prevention and management of diabetes in Canada, Can. J. Diabetes 42 (Suppl 1) (2018) S1–S325. American Diabetes Association. Improving care and promoting health in populations: standards of medical care in diabetes—2018, Diabetes Care 41 (Suppl 1) (2018) S7.	Primary care sites across a Southern region of Ontario, Canada (Family health teams; family-medicine group practices; solo physician practice) (November 2009-August 2014)	Underuse (29.20%)
Vitale, 2020	Diagnostics (Assessments)	Diabetes 6-month visit (Diabetes Mellitus)	Clinical practice guidelines recommend that diabetes care be delivered in accordance with the chronic care model (CCM); from results, recommendation: patients received Diabetes 6-month visits.	Diabetes Canada Clinical Practice Guidelines Expert Committee, Diabetes Canada, Clinical practice guidelines for the prevention and management of diabetes in Canada, Can. J. Diabetes 42 (Suppl 1) (2018) S1–S325. American Diabetes Association. Improving care and promoting health in populations: standards of medical care in diabetes—2018, Diabetes Care 41 (Suppl 1) (2018) S7.	Primary care sites across a Southern region of Ontario, Canada (Family health teams; family-medicine group practices; solo physicianpractice) (November 2009-August 2014)	Underuse (36.30%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
Vitale, 2020	Diagnostics (Assessments)	Eye exams (Diabetes Mellitus)	Clinical practice guidelines recommend that diabetes care be delivered in accordance with the chronic care model (CCM); Not explicitly provided in study; from results, recommendation: patients received Eye exam once a year.	Diabetes Canada Clinical Practice Guidelines Expert Committee, Diabetes Canada, Clinical practice guidelines for the prevention and management of diabetes in Canada, Can. J. Diabetes 42 (Suppl 1) (2018) S1–S325. American Diabetes Association. Improving care and promoting health in populations: standards of medical care in diabetes—2018, Diabetes Care 41 (Suppl 1) (2018) S7.	Primary care sites across a Southern region of Ontario, Canada (Family health teams; family-medicine group practices; solo physician practice) (November 2009-August 2014)	Underuse (57.00%)
Vitale, 2020	Diagnostics (Assessments)	Foot exams (Diabetes Mellitus)	Clinical practice guidelines recommend that diabetes care be delivered in accordance with the chronic care model (CCM); from results, recommendation: patients received Annual foot exam.	Diabetes Canada Clinical Practice Guidelines Expert Committee, Diabetes Canada, Clinical practice guidelines for the prevention and management of diabetes in Canada, Can. J. Diabetes 42 (Suppl 1) (2018) S1–S325. American Diabetes Association. Improving care and promoting health in populations: standards of medical care in diabetes—2018, Diabetes Care 41 (Suppl 1) (2018) S7.	Primary care sites across a Southern region of Ontario, Canada (Family health teams; family-medicine group practices; solo physicianpractice) (November 2009-August 2014)	Underuse (52.50%)
Vitale, 2020	Diagnostics (Blood tests)	Glomerular Filtration Rate (eGFR) (Diabetes Mellitus)	Clinical practice guidelines recommend that diabetes care be delivered in accordance with the chronic care model (CCM); Not explicitly provided in study; from results, recommendation:	Diabetes Canada Clinical Practice Guidelines Expert Committee, Diabetes Canada, Clinical practice guidelines for the prevention and management of diabetes in Canada, Can. J. Diabetes 42 (Suppl 1) (2018) S1–S325. American Diabetes Association. Improving care and promoting health in populations: standards of medical	Primary care sites across a Southern region of Ontario, Canada (Family health teams; family-medicine	Underuse (12.70%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
			patients received annual Estimated Glomerular Filtration Rate (eGFR).	care in diabetes—2018, Diabetes Care 41 (Suppl 1) (2018) S7.	group practices; solo physician practice) (November 2009-August 2014)	
Vitale, 2020	Therapeutics (Biophysical Therapy)	Influenza Vaccine (Diabetes Mellitus)	Clinical practice guidelines recommend that diabetes care be delivered in accordance with the chronic care model (CCM); Not explicitly provided in study; from results, recommendation: patients received Flu vaccine once a year.	Diabetes Canada Clinical Practice Guidelines Expert Committee, Diabetes Canada, Clinical practice guidelines for the prevention and management of diabetes in Canada, Can. J. Diabetes 42 (Suppl 1) (2018) S1–S325. American Diabetes Association. Improving care and promoting health in populations: standards of medical care in diabetes—2018, Diabetes Care 41 (Suppl 1) (2018) S7.	Primary care sites across a Southern region of Ontario, Canada (Family health teams; family-medicine group practices; solo physicianpractice) (November 2009-August 2014)	Underuse (58.50%)
Vitale, 2020	Diagnostics (Blood tests)	Glycated Hemoglobin (HbA1c) (Diabetes Mellitus)	Clinical practice guidelines recommend that diabetes care be delivered in accordance with the chronic care model (CCM); Not explicitly provided in study; from results, recommendation: patients received Hemoglobin A1c (HbA1c) test every 6 months.	Diabetes Canada Clinical Practice Guidelines Expert Committee, Diabetes Canada, Clinical practice guidelines for the prevention and management of diabetes in Canada, Can. J. Diabetes 42 (Suppl 1) (2018) S1–S325. American Diabetes Association. Improving care and promoting health in populations: standards of medical care in diabetes—2018, Diabetes Care 41 (Suppl 1) (2018) S7.	Primary care sites across a Southern region of Ontario, Canada (Family health teams; family-medicine group practices; solo physician practice) (November 2009-August 2014)	Underuse (40.80%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
Vitale, 2020	Diagnostics (Multiple Blood Tests)	Lipids (Various tests - e.g., total cholesterol, HDL, LDL, triglycerides) (Diabetes Mellitus)	Clinical practice guidelines recommend that diabetes care be delivered in accordance with the chronic care model (CCM); from results, recommendation: patients received Total cholesterol ((TC) to High-density Lipoprotein Cholesterol (HDL) ratio test once a year.	Diabetes Canada Clinical Practice Guidelines Expert Committee, Diabetes Canada, Clinical practice guidelines for the prevention and management of diabetes in Canada, Can. J. Diabetes 42 (Suppl 1) (2018) S1–S325. American Diabetes Association. Improving care and promoting health in populations: standards of medical care in diabetes—2018, Diabetes Care 41 (Suppl 1) (2018) S7.	Primary care sites across a Southern region of Ontario, Canada (Family health teams; family-medicine group practices; solo physicianpractice) (November 2009-August 2014)	Underuse (17.30%)
Vitale, 2020	Diagnostics (Multiple Blood Tests)	Lipids (Various tests - e.g., total cholesterol, HDL, LDL, triglycerides) (Diabetes Mellitus)	Clinical practice guidelines recommend that diabetes care be delivered in accordance with the chronic care model (CCM); from results, recommendation: patients received High-density Lipoprotein Cholesterol (HDL) test once a year.	Diabetes Canada Clinical Practice Guidelines Expert Committee, Diabetes Canada, Clinical practice guidelines for the prevention and management of diabetes in Canada, Can. J. Diabetes 42 (Suppl 1) (2018) S1–S325. American Diabetes Association. Improving care and promoting health in populations: standards of medical care in diabetes—2018, Diabetes Care 41 (Suppl 1) (2018) S7.	Primary care sites across a Southern region of Ontario, Canada (Family health teams; family-medicine group practices; solo physician practice) (November 2009-August 2014)	Underuse (16.50%)
Vitale, 2020	Diagnostics (Multiple Blood Tests)	Lipids (Various tests - e.g., total cholesterol, HDL, LDL, triglycerides) (Diabetes Mellitus)	Clinical practice guidelines recommend that diabetes care be delivered in accordance with the chronic care model (CCM); from results, recommendation: patients received Low-	Diabetes Canada Clinical Practice Guidelines Expert Committee, Diabetes Canada, Clinical practice guidelines for the prevention and management of diabetes in Canada, Can. J. Diabetes 42 (Suppl 1) (2018) S1–S325. American Diabetes Association. Improving care and promoting health in populations: standards of medical	Primary care sites across a Southern region of Ontario, Canada (Family health teams; family-medicine	Underuse (18.30%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
			density Lipoprotein Cholesterol (LDL-C) test once a year.	care in diabetes—2018, Diabetes Care 41 (Suppl 1) (2018) S7.	group practices; solo physicianpractice) (November 2009-August 2014)	
Walker, 2020	Therapeutics (Medications)	Antipsychotics-medication(s) not specified (Studies of Potentially Inappropriate Medications)	Potentially inappropriate use of antipsychotics was defined as whether or not residents without a diagnosis of psychosis were administered antipsychotic drugs at least once in the 7 days prior to the assessment.	Hofmann H, Hahn S. Characteristics of nursing home residents and physical restraint: a systematic literature review. J Clin Nurs. 2014;23(21–22):3012–3024. doi:10.1111/jocn.12384 Köpke S, Mühlhauser I, Gerlach A, et al. Effect of a guideline-based multicomponent intervention on use of physical restraints in nursing homes: a randomized controlled trial. JAMA. 2012;307(20):2177–2184. doi:10.1001/jama.2012.4517 Harrington C, Carrillo H. The regulation and enforcement of federal nursing home standards, 1991-1997. Med Care Res Rev. 1999; 56:471–494. doi:10.1177/107755879905600405 Mukamel DB, Weimer DL, Harrington C, Spector WD, Ladd H, Li Y. The effect of state regulatory stringency on nursing home quality. Health Serv Res. 2012; 47:1791–1813. doi:10.1111/j.1475-6773.2012. 01459.x Mor V, Gruneir A, Feng Z, Grabowski DC, Intrator O, Zinn J. The effect of state policies on nursing home resident outcomes. J Am Geriatr Soc. 2011; 59:3–9. doi:10.1111/j.1532-5415.2010. 03230.x Ministry of Health and Long-term Care. About the Excellent Care for All Act. http://health.gov.on.ca/en/pro/programs/ecfa/legislation/act.aspx. Canadian Institute for Health Information. Indicator Library.	Continuing Care Resident Survey for LTC dataset (January 2008-December 2014)	Overuse (26.80%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				http://indicatorlibrary.cihi.ca/display/HSPIL/Indicator+Library?desktop=true. Accessed March 14, 2018. Zimmerman DR, Karon SL, Arling G, et al. Development and testing of nursing home quality indicators. Health Care Financ Rev. 1995; 16:107–127.		
Walker, 2020	Therapeutics (Biophysical Therapy)	Physical restraints (Physical Restraint Use in Long-term Care Homes)	Physical restraint use was defined as the use of trunk, limb, and chair restraints in the 7 days prior to the assessment.	Hofmann H, Hahn S. Characteristics of nursing home residents and physical restraint: a systematic literature review. J Clin Nurs. 2014;23(21–22):3012–3024. doi:10.1111/jocn.12384 Köpke S, Mühlhauser I, Gerlach A, et al. Effect of a guideline-based multicomponent intervention on use of physical restraints in nursing homes: a randomized controlled trial. JAMA. 2012;307(20):2177–2184. doi:10.1001/jama.2012.4517 Harrington C, Carrillo H. The regulation and enforcement of federal nursing home standards, 1991-1997. Med Care Res Rev. 1999; 56:471–494. doi:10.1177/107755879905600405 Mukamel DB, Weimer DL, Harrington C, Spector WD, Ladd H, Li Y. The effect of state regulatory stringency on nursing home quality. Health Serv Res. 2012; 47:1791–1813. doi:10.1111/j.1475-6773.2012.01459.x Mor V, Gruneir A, Feng Z, Grabowski DC, Intrator O, Zinn J. The effect of state policies on nursing home resident outcomes. J Am Geriatr Soc. 2011; 59:3–9. doi:10.1111/j.1532-5415.2010. 03230.x Ministry of Health and Long-term Care. About the Excellent Care for All Act. http://health.gov.on.ca/en/pro/programs/ecfa/legislation/act.aspx.	Continuing Care Resident Survey for LTC dataset (January 2008-December 2014)	Overuse (7.80%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				Canadian Institute for Health Information. Indicator Library. http://indicatorlibrary.cihi.ca/display/HSPIL/Indicator+Library?desktop=true. Accessed March 14, 2018. Zimmerman DR, Karon SL, Arling G, et al. Development and testing of nursing home quality indicators. Health Care Financ Rev. 1995; 16:107–127.		
Wanis, 2013	Diagnostics (Imaging)	Radionuclide Imaging Scan (Thyroid Nodules)	Patients with low TSH should be evaluated with a radionuclide thyroid scan.	Cooper DS, Doherty GM, Haugen BR et al. Revised American Thyroid Association management guidelines for patients with thyroid nodules and differentiated thyroid cancer. Thyroid 2009; 19:1167–214	N/A (June 8, 2011-June 8, 2012)	Overuse (6.25%)
Wanis, 2013	*Multiple Tests*	Thyroid Stimulating Hormone + Thyroid Ultrasonography (Thyroid Nodules)	For the detection of thyroid nodules: recommend a serum thyroid stimulating hormone (TSH) test + thyroid ultrasonography.	Cooper DS, Doherty GM, Haugen BR et al. Revised American Thyroid Association management guidelines for patients with thyroid nodules and differentiated thyroid cancer. Thyroid 2009; 19:1167–214	N/A (June 8, 2011-June 8, 2012)	Underuse (47.40%)
Weir, 2020	Therapeutics (Medications)	Benzodiazepines-medication(s) not specified (Studies of Potentially Inappropriate Medications)	Guideline nonadherence according to AGS Beers Criteria, STOPP, Choosing Wisely; Benzodiazepines were prescribed to patients without epilepsy or anxiety: Diazepam, oxazepam, lorazepam, bromazepam, alprazolam, flurazepam, nitrazepam, temazepam.	Hamilton H, Gallagher P, Ryan C, Byrne S, O'Mahony D. Potentially inappropriate medications defined by STOPP criteria and the risk of adverse drug events in older hospitalized patients. Arch Intern Med. 2011; 171:1013-1019. Hill-Taylor B, Sketris I, Hayden J, Byrne S, O'Sullivan D, Christie R. Application of the STOPP/START criteria: a systematic review of the prevalence of potentially inappropriate prescribing in older adults, and evidence of clinical, humanistic and economic impact. J Clin Pharm Ther. 2013; 38:360-372. O'Mahony D, O'Sullivan D, Byrne S, O'Connor MN, Ryan C, Gallagher P. STOPP/START criteria for potentially inappropriate prescribing in older people: version 2. Age Ageing. 2015; 44:213-218.	Quebec provincial healthcare administrative database; pharmacy claims database (October 2014-November 2016)	Overuse (25.90%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				By the American Geriatrics Society 2015 Beers Criteria Update Expert Panel. American Geriatrics Society 2015 updated Beers Criteria for potentially inappropriate medication use in older adults. J Am Geriatr Soc. 2015; 63:2227-2246. Choosing Wisely. Choosing Wisely Canada Recommendations [Internet]. 2018. https://choosingwiselycanada.org/recommendations/. Accessed December 2017. EG MD, Wu PE, Rashidi B, et al. The MedSafer study: a controlled trial of an electronic decision support tool for deprescribing in acute care. J Am Geriatr Soc. 2019;67(9):1843-1850.		
Weir, 2020	Therapeutics (Medications)	Nonsteroidal Anti-inflammatory Drugs-medication(s) not specified (Studies of Potentially Inappropriate Medications)	Guideline nonadherence according to AGS Beers Criteria, STOPP, Choosing Wisely; Cyclooxygenase-2 inhibitors prescribed to patients with hypertension: Celecoxib.	Hamilton H, Gallagher P, Ryan C, Byrne S, O'Mahony D. Potentially inappropriate medications defined by STOPP criteria and the risk of adverse drug events in older hospitalized patients. Arch Intern Med. 2011; 171:1013-1019. Hill-Taylor B, Sketris I, Hayden J, Byrne S, O'Sullivan D, Christie R. Application of the STOPP/START criteria: a systematic review of the prevalence of potentially inappropriate prescribing in older adults, and evidence of clinical, humanistic and economic impact. J Clin Pharm Ther. 2013; 38:360-372. O'Mahony D, O'Sullivan D, Byrne S, O'Connor MN, Ryan C, Gallagher P. STOPP/START criteria for potentially inappropriate prescribing in older people: version 2. Age Ageing. 2015; 44:213-218. By the American Geriatrics Society 2015 Beers Criteria Update Expert Panel. American Geriatrics Society 2015 updated Beers Criteria for potentially inappropriate medication use in older adults. J Am Geriatr Soc. 2015; 63:2227-2246.	Quebec provincial healthcare administrative database; pharmacy claims database (October 2014-November 2016)	Overuse (5.60%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				Choosing Wisely. Choosing Wisely Canada Recommendations [Internet]. 2018. https://choosingwiselycanada.org/recommendations/. Accessed December 2017. EG MD, Wu PE, Rashidi B, et al. The MedSafer study: a controlled trial of an electronic decision support tool for deprescribing in acute care. J Am Geriatr Soc. 2019;67(9):1843-1850.		
Weir, 2020	Therapeutics (Medications)	Opioids-medication(s) not specified (Studies of Potentially Inappropriate Medications)	Guideline nonadherence according to AGS Beers Criteria, STOPP, Choosing Wisely; Opioids prescribed to patients with delirium without cancer: Codeine, fentanyl, hydromorphone, morphine, oxycodone.	Hamilton H, Gallagher P, Ryan C, Byrne S, O'Mahony D. Potentially inappropriate medications defined by STOPP criteria and the risk of adverse drug events in older hospitalized patients. Arch Intern Med. 2011; 171:1013-1019. Hill-Taylor B, Sketris I, Hayden J, Byrne S, O'Sullivan D, Christie R. Application of the STOPP/START criteria: a systematic review of the prevalence of potentially inappropriate prescribing in older adults, and evidence of clinical, humanistic and economic impact. J Clin Pharm Ther. 2013; 38:360-372. O'Mahony D, O'Sullivan D, Byrne S, O'Connor MN, Ryan C, Gallagher P. STOPP/START criteria for potentially inappropriate prescribing in older people: version 2. Age Ageing. 2015; 44:213-218. By the American Geriatrics Society 2015 Beers Criteria Update Expert Panel. American Geriatrics Society 2015 updated Beers Criteria for potentially inappropriate medication use in older adults. J Am Geriatr Soc. 2015; 63:2227-2246. Choosing Wisely. Choosing Wisely Canada Recommendations [Internet]. 2018. https://choosingwiselycanada.org/recommendations/. Accessed December 2017.	Quebec provincial healthcare administrative database; pharmacy claims database (October 2014-November 2016)	Overuse (3.00%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				EG MD, Wu PE, Rashidi B, et al. The MedSafer study: a controlled trial of an electronic decision support tool for deprescribing in acute care. J Am Geriatr Soc. 2019;67(9):1843-1850.		
Weir, 2020	Therapeutics (Medications)	Proton Pump Inhibitors-medication(s) not specified (Studies of Potentially Inappropriate Medications)	Guideline nonadherence according to AGS Beers Criteria, STOPP, Choosing Wisely; Proton pump inhibitors were prescribed to patients without gastrointestinal hemorrhage or peptic ulcer not taking anticoagulant agents: Omeprazole, pantoprazole, lansoprazole, rabeprazole, esomeprazole, dexlansoprazole.	Hamilton H, Gallagher P, Ryan C, Byrne S, O'Mahony D. Potentially inappropriate medications defined by STOPP criteria and the risk of adverse drug events in older hospitalized patients. Arch Intern Med. 2011; 171:1013-1019. Hill-Taylor B, Sketris I, Hayden J, Byrne S, O'Sullivan D, Christie R. Application of the STOPP/START criteria: a systematic review of the prevalence of potentially inappropriate prescribing in older adults, and evidence of clinical, humanistic and economic impact. J Clin Pharm Ther. 2013; 38:360-372. O'Mahony D, O'Sullivan D, Byrne S, O'Connor MN, Ryan C, Gallagher P. STOPP/START criteria for potentially inappropriate prescribing in older people: version 2. Age Ageing. 2015; 44:213-218. By the American Geriatrics Society 2015 Beers Criteria Update Expert Panel. American Geriatrics Society 2015 updated Beers Criteria for potentially inappropriate medication use in older adults. J Am Geriatr Soc. 2015; 63:2227-2246. Choosing Wisely. Choosing Wisely Canada Recommendations [Internet]. 2018. https://choosingwiselycanada.org/recommendations/. Accessed December 2017. EG MD, Wu PE, Rashidi B, et al. The MedSafer study: a controlled trial of an electronic decision support tool for deprescribing in acute care. J Am Geriatr Soc. 2019;67(9):1843-1850.	Quebec provincial healthcare administrative database; pharmacy claims database (October 2014-November 2016)	Overuse (8.30%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
Weir, 2020	Therapeutics (Medications)	Selective α-1-Adrenergic Blocking Agents-e.g., Alfuzosin, Tamsulosin, Silodosin (Studies of Potentially Inappropriate Medications)	Guideline nonadherence according to AGS Beers Criteria, STOPP, Choosing Wisely; Selective α-1-adrenergic blocking agents prescribed to patients with hypertension without prostatic hypertrophy: Alfuzosin, tamsulosin, silodosin.	Hamilton H, Gallagher P, Ryan C, Byrne S, O'Mahony D. Potentially inappropriate medications defined by STOPP criteria and the risk of adverse drug events in older hospitalized patients. Arch Intern Med. 2011; 171:1013-1019. Hill-Taylor B, Sketris I, Hayden J, Byrne S, O'Sullivan D, Christie R. Application of the STOPP/START criteria: a systematic review of the prevalence of potentially inappropriate prescribing in older adults, and evidence of clinical, humanistic and economic impact. J Clin Pharm Ther. 2013; 38:360-372. O'Mahony D, O'Sullivan D, Byrne S, O'Connor MN, Ryan C, Gallagher P. STOPP/START criteria for potentially inappropriate prescribing in older people: version 2. Age Ageing. 2015; 44:213-218. By the American Geriatrics Society 2015 Beers Criteria Update Expert Panel. American Geriatrics Society 2015 updated Beers Criteria for potentially inappropriate medication use in older adults. J Am Geriatr Soc. 2015; 63:2227-2246. Choosing Wisely. Choosing Wisely Canada Recommendations [Internet]. 2018. https://choosingwiselycanada.org/recommendations/. Accessed December 2017. EG MD, Wu PE, Rashidi B, et al. The MedSafer study: a controlled trial of an electronic decision support tool for deprescribing in acute care. J Am Geriatr Soc. 2019;67(9):1843-1850.	Quebec provincial healthcare administrative database; pharmacy claims database (October 2014-November 2016)	Overuse (5.60%)
Welk, 2018	Diagnostics (Imaging)	Bone scan (Prostate Cancer)	Guidelines do not recommend that men with a diagnosis of low risk prostate cancer (i.e., defined as the absence of active	Five Things Physicians and Patients Should Question-AUA. Published July 1, 2015. Available at http://www.choosingwisely.org/societies/american-urological-association/. Accessed July 22, 2015.	Canadian Institute for Health Information Discharge Abstract	Overuse (22.00%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
			treatment during their first year after diagnosis) undergo a bone scan.	Five Things Physicians and Patients Should Question-CUA. Published June 24, 2015. Available at http://www.choosingwiselycanada.org/recommendations/ urology/. Accessed July 22, 2015.	database; Canadian Institute for Health Information Same Day Surgery database; Canadian Institute for Health Information National Ambulatory Care Reporting System; Ontario Health Insurance Plan; Ontario Drug Benefit database; Ontario Cancer Registry; Registered Persons database (April 1, 2008 - March 31, 2017)	
Welk, 2018	Diagnostics (Blood tests)	Testosterone (Prostate Cancer)	Guidelines do not recommend that men greater than 66 years of age obtain a serum testosterone level before starting testosterone therapy.	Five Things Physicians and Patients Should Question-AUA. Published July 1, 2015. Available at http://www.choosingwisely.org/societies/american-urological-association/. Accessed July 22, 2015. Five Things Physicians and Patients Should Question-CUA. Published June 24, 2015. Available at	Canadian Institute for Health Information Discharge Abstract database; Canadian Institute for	Overuse (3.10%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				http://www.choosingwiselycanada.org/recommendations/ urology/. Accessed July 22, 2015.	Health Information Same Day Surgery database; Canadian Institute for Health Information National Ambulatory Care Reporting System; Ontario Health Insurance Plan; Ontario Drug Benefit database; Ontario Cancer Registry; Registered Persons database (April 1, 2008 - March 31, 2017)	
Welk, 2019	Diagnostics (Imaging)	Ultrasound-Abdominal (Preoperative (Orchiopexy Surgery))	Guidelines do not recommend that boys less than or equal to 18 years of age undergo an abdominal ultrasound before undergoing orchiopexy surgery.	Five Things Physicians and Patients Should Question-AUA. Published July 1, 2015. Available at http://www.choosingwisely.org/societies/american-urological-association/. Accessed July 22, 2015. Five Things Physicians and Patients Should Question-CUA. Published June 24, 2015. Available at http://www.choosingwiselycanada.org/recommendations/ urology/. Accessed July 22, 2015.	Canadian Institute for Health Information Discharge Abstract database; Canadian Institute for Health Information Same Day	Overuse (58.00%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
					Surgery database; Canadian Institute for Health Information National Ambulatory Care Reporting System; Ontario Health Insurance Plan; Ontario Drug Benefit database; Ontario Cancer Registry; Registered Persons database (April 1, 2008 - March 31, 2017)	
Wintemute, 2019	Diagnostics (Blood tests)	Thyroid Stimulating Hormone (Not Specified)	Guidelines advise against ordering thyroid function tests in asymptomatic patients.	Thyroid function tests in the diagnosis and monitoring of adults. Vancouver, BC: Province of British Columbia; 2010. Available from: www2.gov.bc.ca/gov/content/health/practitioner-professional-resources/bc-guidelines/thyroid-testing#two. Accessed 2017 Mar 25. LeFevre ML; US Preventive Services Task Force. Screening for thyroid dysfunction: US Preventive Services Task Force recommendation statement. Ann Intern Med 2015;162(9):641-50. College of Family Physicians of Canada. Family medicine. Thirteen things physicians and patients should question. Toronto, ON: Choosing Wisely	EMR data from the University of Toronto Practice-Based Research Network Data Safe Haven (January 1, 2016-December 31, 2017)	Overuse (35.10%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				Canada; 2014. www.choosing wiselycanada.org/recommendations/family-medicine/. Accessed 2017 Mar 25.		
Wirth, 2020	Diagnostics (Referrals)	Pulmonary Rehabilitation Program (COPD)	Guidelines recommend medical therapies, along with many non-pharmacologic interventions (smoking cessation, vaccination against pneumococcus and influenza, patient education and self-management, and pulmonary rehabilitation), have been demonstrated to improve the adverse consequences of COPD.	Criner GJ, Bourbeau J, Diekemper RL, et al. Prevention of acute exacerbations of COPD: ACCP and CTS guideline. Chest. 2015; 147(4):883–893. Walters JA, Tang JNQ, Poole P, et al. Pneumococcal vaccines for preventing pneumonia in chronic obstructive pulmonary disease (Review). Cochrane Database Syst Rev. 2017;1(1):CD001390 Issue Art. No.: doi: 10.1002/14651858.CD001390.pub4. Poole P, Chacko EE, Wood-Baker R, et al. Influenza vaccine for patients with chronic obstructive pulmonary disease. Cochrane Database of Systematic Reviews. 2006;1: Art. No.: CD002733. doi: 10.1002/14651858.CD002733.pub2. McCarthy B, Casey D, Devane D, et al. Pulmonary rehabilitation for chronic obstructive pulmonary disease. Cochrane Database of Systematic Reviews. 2015;2: Art. No.: CD003793. doi: 10.1002/14651858.CD003793.pub3. Puhan MA, Gimeno-Santos E, Cates CJ, et al. Pulmonary rehabilitation following exacerbations of chronic obstructive pulmonary disease. Cochrane Database of Systematic Reviews. 2016; 12: Art. No.: CD005305. doi: 10.1002/14651858.CD005305.pub4. Vestbo J, Hurd SS, Agustı AG, et al. Global strategy for the diagnosis, management, and prevention of chronic obstructive pulmonary disease. Am J Respir Crit Care Med.2013;187(4): 347–365. doi:10.1164/rccm.201204-0596PP. O'Donnell DE, Aaron S, Bourbeau J, et al. Canadian Thoracic Society recommendations for management of chronic obstructive pulmonary disease – 2007	Hospital chart; Royal University Hospital; St. Paul's Hospital (January 1, 2016-December 31, 2016)	Underuse (34.20%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				update. Can Respir J. 2007; 14:5B–32B.doi:10.1155/2007/926421. O'Donnell DE, Hernandez P, Kaplan A, et al. Canadian Thoracic Society recommendations for management of chronic obstructive pulmonary disease – 2008 update – highlights for primary care. Can Respir J. 2008; 15:1A–8A.		
Wirth, 2020	Therapeutics (Medications)	Smoking Cessation-Drug Unknown (COPD)	Guidelines recommend medical therapies, along with many non-pharmacologic interventions (smoking cessation, vaccination against pneumococcus and influenza, patient education and self-management, and pulmonary rehabilitation), have been demonstrated to improve the adverse consequences of COPD.	Criner GJ, Bourbeau J, Diekemper RL, et al. Prevention of acute exacerbations of COPD: ACCP and CTS guideline. Chest. 2015; 147(4):883–893. Walters JA, Tang JNQ, Poole P, et al. Pneumococcal vaccines for preventing pneumonia in chronic obstructive pulmonary disease (Review). Cochrane Database Syst Rev. 2017;1(1):CD001390 Issue Art. No.: doi: 10.1002/14651858.CD001390.pub4. Poole P, Chacko EE, Wood-Baker R, et al. Influenza vaccine for patients with chronic obstructive pulmonary disease. Cochrane Database of Systematic Reviews. 2006;1: Art. No.: CD002733. doi: 10.1002/14651858.CD002733.pub2. McCarthy B, Casey D, Devane D, et al. Pulmonary rehabilitation for chronic obstructive pulmonary disease. Cochrane Database of Systematic Reviews. 2015;2: Art. No.: CD003793. doi: 10.1002/14651858.CD003793.pub3. Puhan MA, Gimeno-Santos E, Cates CJ, et al. Pulmonary rehabilitation following exacerbations of chronic obstructive pulmonary disease. Cochrane Database of Systematic Reviews. 2016; 12: Art. No.: CD005305. doi: 10.1002/14651858.CD005305.pub4. Vestbo J, Hurd SS, Agustı AG, et al. Global strategy for the diagnosis, management, and prevention of chronic obstructive pulmonary disease. Am J Respir	Hospital chart; Royal University Hospital; St. Paul's Hospital (January 1, 2016-December 31, 2016)	Underuse (52.10%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				Crit Care Med.2013;187(4): 347–365. doi:10.1164/rccm.201204-0596PP. O'Donnell DE, Aaron S, Bourbeau J, et al. Canadian Thoracic Society recommendations for management of chronic obstructive pulmonary disease – 2007 update. Can Respir J. 2007; 14:5B–32B.doi:10.1155/2007/926421. O'Donnell DE, Hernandez P, Kaplan A, et al. Canadian Thoracic Society recommendations for management of chronic obstructive pulmonary disease – 2008 update – highlights for primary care. Can Respir J. 2008; 15:1A–8A.		
Wirth, 2020	Therapeutics (Biophysical Therapy)	Influenza Vaccine (COPD)	Guidelines recommend medical therapies, along with many non-pharmacologic interventions (smoking cessation, vaccination against pneumococcus and influenza, patient education and self-management, and pulmonary rehabilitation), have been demonstrated to improve the adverse consequences of COPD.	Criner GJ, Bourbeau J, Diekemper RL, et al. Prevention of acute exacerbations of COPD: ACCP and CTS guideline. Chest. 2015; 147(4):883–893. Walters JA, Tang JNQ, Poole P, et al. Pneumococcal vaccines for preventing pneumonia in chronic obstructive pulmonary disease (Review). Cochrane Database Syst Rev. 2017;1(1):CD001390 Issue Art. No.: doi: 10.1002/14651858.CD001390.pub4. Poole P, Chacko EE, Wood-Baker R, et al. Influenza vaccine for patients with chronic obstructive pulmonary disease. Cochrane Database of Systematic Reviews. 2006;1: Art. No.: CD002733. doi: 10.1002/14651858.CD002733.pub2. McCarthy B, Casey D, Devane D, et al. Pulmonary rehabilitation for chronic obstructive pulmonary disease. Cochrane Database of Systematic Reviews. 2015;2: Art. No.: CD003793. doi: 10.1002/14651858.CD003793.pub3. Puhan MA, Gimeno-Santos E, Cates CJ, et al. Pulmonary rehabilitation following exacerbations of chronic obstructive pulmonary disease. Cochrane	Hospital chart; Royal University Hospital; St.Paul's Hospital (January 1, 2016-December 31, 2016)	Underuse (20.00%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				Database of Systematic Reviews. 2016; 12: Art. No.: CD005305. doi: 10.1002/14651858.CD005305.pub4. Vestbo J, Hurd SS, Agustı AG, et al. Global strategy for the diagnosis, management, and prevention of chronic obstructive pulmonary disease. Am J Respir Crit Care Med.2013;187(4): 347–365. doi:10.1164/rccm.201204-0596PP. O'Donnell DE, Aaron S, Bourbeau J, et al. Canadian Thoracic Society recommendations for management of chronic obstructive pulmonary disease – 2007 update. Can Respir J. 2007; 14:5B–32B.doi:10.1155/2007/926421. O'Donnell DE, Hernandez P, Kaplan A, et al. Canadian Thoracic Society recommendations for management of chronic obstructive pulmonary disease – 2008 update – highlights for primary care. Can Respir J. 2008; 15:1A–8A.		
Wirth, 2020	Therapeutics (Biophysical Therapy)	Pneumococcal Vaccine (COPD)	Guidelines recommend medical therapies, along with many non-pharmacologic interventions (smoking cessation, vaccination against pneumococcus and influenza, patient education and self-management, and pulmonary rehabilitation), have been demonstrated to improve the adverse consequences of COPD.	Criner GJ, Bourbeau J, Diekemper RL, et al. Prevention of acute exacerbations of COPD: ACCP and CTS guideline. Chest. 2015; 147(4):883–893. Walters JA, Tang JNQ, Poole P, et al. Pneumococcal vaccines for preventing pneumonia in chronic obstructive pulmonary disease (Review). Cochrane Database Syst Rev. 2017;1(1):CD001390 Issue Art. No.: doi: 10.1002/14651858.CD001390.pub4. Poole P, Chacko EE, Wood-Baker R, et al. Influenza vaccine for patients with chronic obstructive pulmonary disease. Cochrane Database of Systematic Reviews. 2006;1: Art. No.: CD002733. doi: 10.1002/14651858.CD002733.pub2. McCarthy B, Casey D, Devane D, et al. Pulmonary rehabilitation for chronic obstructive pulmonary disease. Cochrane Database of Systematic Reviews.	Hospital chart; Royal University Hospital; St. Paul's Hospital (January 1, 2016-December 31, 2016)	Underuse (34.00%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
				2015;2: Art. No.: CD003793. doi: 10.1002/14651858.CD003793.pub3. Puhan MA, Gimeno-Santos E, Cates CJ, et al. Pulmonary rehabilitation following exacerbations of chronic obstructive pulmonary disease. Cochrane Database of Systematic Reviews. 2016; 12: Art. No.: CD005305. doi: 10.1002/14651858.CD005305.pub4. Vestbo J, Hurd SS, Agustı AG, et al. Global strategy for the diagnosis, management, and prevention of chronic obstructive pulmonary disease. Am J Respir Crit Care Med.2013;187(4): 347–365. doi:10.1164/rccm.201204-0596PP. O'Donnell DE, Aaron S, Bourbeau J, et al. Canadian Thoracic Society recommendations for management of chronic obstructive pulmonary disease – 2007 update. Can Respir J. 2007; 14:5B–32B.doi:10.1155/2007/926421. O'Donnell DE, Hernandez P, Kaplan A, et al. Canadian Thoracic Society recommendations for management of chronic obstructive pulmonary disease – 2008 update – highlights for primary care. Can Respir J. 2008; 15:1A–8A.		
Wong, 2017	*Multiple Tests*	Ultrasound +/- Fine Needle Aspiration (Thyroid Incidentalomas)	Recommended that patients with Positron emission tomography (PET) diagnosed focal thyroid incidentalomas (TI) should, if the patient does not have any serious comorbidities or a significantly limited life expectancy, undergo both an ultrasound (US) and Fine Needle Aspiration (FNAB) if	Haugen BR, Alexander EK, Bible KC, et al. American thyroid association management guidelines for adult patients with thyroid nodules and differentiated thyroid cancer. Thyroid. 2015;26(1):1e133, 2015. Hoang JK, Langer JE, Middleton WD, et al. Managing incidental thyroid nodules detected on imaging: white paper of the ACR incidental thyroid findings committee. J Am Coll Radiol. 2015;12(2):143e150.	N/A (2011 - 2014)	Underuse (54.00%)

First Author, Year	Care Category	Services Evaluated (Health Condition)	Evidence Recommendation	Evidence Reference(s)	Data Source (Time Period)	Inappropriate Care Result
			the nodule is 1 cm or larger in size.			
Wong, 2017	*Multiple Tests*	Ultrasound +/- Fine Needle Aspiration (Thyroid Incidentalomas)	Recommended that patients with Positron emission tomography (PET) diagnosed diffuse thyroid incidentalomas (TIs) most often represents benign disease, but still encourage prompt sonographic examination to ensure that there is no clinically significant nodularity.	Haugen BR, Alexander EK, Bible KC, et al. American thyroid association management guidelines for adult patients with thyroid nodules and differentiated thyroid cancer. Thyroid. 2015;26(1):1e133, 2015. Hoang JK, Langer JE, Middleton WD, et al. Managing incidental thyroid nodules detected on imaging: white paper of the ACR incidental thyroid findings committee. J Am Coll Radiol. 2015;12(2):143e150.	N/A (2011 - 2014)	Underuse (90.00%)