

Appendix 1 (as submitted by the authors): Search strategy and rationale behind judgments of risk of bias using the Quality in Prognosis Studies tool

Part 1: Search strategy to retrieve citations for the systematic review

Medline

Ovid MEDLINE(R) 1946 to October Week 2 2016

1	(surpri#e* adj1 question*).mp,kw.
2	"would I be surpris#ed".mp,kw.
3	(surpri#e* and SQ).mp,kw.
4	"I would not be surpris#e*".mp,kw.
5	"would be surpris#ing".mp,kw.
6	or/1-5
7	exp Mortality/
8	mo.fs. [Mortality floating subheading]
9	exp Death/
10	(death* or die or died or dies or dying).mp,kw.
11	mortalit*.mp,kw.
12	exp Terminal Care/
13	exp Terminally Ill/
14	exp Palliative Care/
15	Palliative Medicine/
16	terminal??.mp,kw.
17	palliat*.mp,kw.
18	or/7-17
19	6 and 18

Medline In-Process

Epub Ahead of Print and In-Process & Other Non-Indexed Citations Ovid MEDLINE(R) October 19, 2016

1	(surpri#e* adj1 question*).mp,kw.
2	"would I be surpris#ed".mp,kw.
3	(surpri#e* and SQ).mp,kw.
4	"I would not be surpris#e*".mp,kw.
5	"would be surpris#ing".mp,kw.
6	or/1-5
7	exp Mortality/

8	mo.fs. [Mortality floating subheading]
9	exp Death/
10	(death* or die or died or dies or dying).mp,kw.
11	mortalit*.mp,kw.
12	exp Terminal Care/
13	exp Terminally Ill/
14	exp Palliative Care/
15	Palliative Medicine/
16	terminal??.mp,kw.
17	palliat*.mp,kw.
18	or/7-17
19	6 and 18

Embase

Embase Classic+Embase 1947 to 2016 October 19

1	(surpri#e* adj1 question*).mp,kw.
2	"would I be surpris#ed".mp,kw.
3	(surpri#e* and SQ).mp,kw.
4	"I would not be surpris#e".mp,kw.
5	"would be surpris#ing".mp,kw.
6	or/1-5
7	exp Mortality/
8	exp Death/
9	(death* or die or died or dies or dying).mp,kw.
10	mortalit*.mp,kw.
11	terminal??.mp,kw.
12	palliat*.mp,kw.
13	exp terminal disease/
14	exp palliative therapy/
15	exp palliative nursing/
16	exp terminal care/
17	or/7-16
18	6 and 17
19	limit 18 to english language
20	limit 19 to embase

CCTR

EBM Reviews - Cochrane Central Register of Controlled Trials September 2016

1	(surpri#e* adj1 question*).mp,kw.
2	"would I be surprի#ed".mp,kw.
3	(surpri#e* and SQ).mp,kw.
4	"I would not be surprի#e*".mp,kw.
5	or/1-4

CDSR

EBM Reviews - Cochrane Database of Systematic Reviews 2005 to October 19, 2016

1	(surpri#e* adj1 question*).mp,kw.
2	"would I be surprի#ed".mp,kw.
3	(surpri#e* and SQ).mp,kw.
4	"I would not be surprի#e*".mp,kw.
5	or/1-4

PsycINFO

PsycINFO 1806 to October Week 2 2016

1	(surpri#e* adj1 question*).mp.
2	"would I be surprի#ed".mp.
3	(surpri#e* and SQ).mp.
4	"I would not be surprի#e*".mp.
5	"would be surprի#ing".mp.
6	or/1-5
7	exp Mortality/
8	(death* or die or died or dies or dying).mp.
9	mortalit*.mp.
10	terminal??.mp.
11	palliat*.mp.
12	exp "death and dying"/
13	exp Terminally Ill Patients/
14	exp Palliative Care/
15	or/7-14
16	6 and 15

CINAHL (EbscoHost)

#	Query	Limiters/Expanders	Last Run Via
S21	S8 AND S20	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search

			Database - CINAHL with Full Text
S20	S9 OR S10 OR S11 OR S12 OR S13 OR S14 OR S15 OR S16 OR S17 OR S18 OR S19	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL with Full Text
S19	(MH "Life Expectancy")	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL with Full Text
S18	die OR dies OR died OR dying	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL with Full Text
S17	palliat*	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL with Full Text
S16	terminal OR terminally	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL with Full Text
S15	(MH "Terminal Care+") OR (MH "Terminal Care (Saba CCC)+") OR (MH "Palliative Care") OR (MH "Hospice Care") OR (MH "Terminally Ill Patients+")	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL with Full Text
S14	death*	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL with Full Text
S13	(MH "Death+")	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL with Full Text
S12	mortalit*	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL with Full Text
S11	(MH "Mortality+") OR (MH "Hospital Mortality")	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL with Full Text
S10	prognos*	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL with Full Text
S9	(MH "Prognosis+")	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL with Full Text
S8	S1 OR S2 OR S3 OR S4 OR S5 OR S6 OR S7	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL with Full Text
S7	"would not be surprised"	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL with Full Text
S6	"would you be surprised"	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases

			Search Screen - Advanced Search Database - CINAHL with Full Text
S5	"would you be surprised"	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL with Full Text
S4	"would I be surprized"	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL with Full Text
S3	"would I be surprised"	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL with Full Text
S2	surprise* N1 question*	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL with Full Text
S1	surprise* N1 question*	Search modes - Boolean/Phrase	Interface - EBSCOhost Research Databases Search Screen - Advanced Search Database - CINAHL with Full Text

Web of Science
Web of Science™ Core Collection

Set	
# 10	#8 NOT #9 Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH Timespan=All years
# 9	PMID=(1* OR 2* OR 3* OR 4* OR 5* OR 6* OR 7* OR 8* or 9*) Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH Timespan=All years
# 8	#7 AND #6 Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH Timespan=All years
# 7	TOPIC: (mortalit*) OR TOPIC: (death* OR die OR dies OR died OR dying) OR TOPIC: (terminal OR terminally) OR TOPIC: (palliat*) OR TOPIC: (prognos*) OR TOPIC: (life expectan*) OR TOPIC: (surviv*) Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH Timespan=All years
# 6	#5 OR #4 OR #3 OR #1 Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH Timespan=All years
# 5	TOPIC: ("would not be surprised") Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH Timespan=All years
# 4	TOPIC: ("would you be surprised") Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH Timespan=All years
# 3	TOPIC: ("would I be surprised") Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH Timespan=All years
# 2	TOPIC: (surprize* NEAR/1 question*) Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH Timespan=All years
# 1	TOPIC: (surprise* NEAR/1 question*) Indexes=SCI-EXPANDED, SSCI, A&HCI, CPCI-S, CPCI-SSH Timespan=All years

Scopus: Scopus Update Search

((((TITLE-ABS-KEY (surprise* W/1 question*) OR TITLE-ABS-KEY (surprize* W/1 question*))) OR ((TITLE-ABS-KEY ("would I be surprised") OR TITLE-ABS-KEY ("would I be surprized"))) OR ((TITLE-ABS-KEY ("would you be surprised") OR TITLE-ABS-KEY ("would you be surprized"))) OR (TITLE-ABS-KEY ("would not be surprised"))) AND (TITLE-ABS-KEY (die OR dies OR died OR dying OR death* OR prognos* OR mortalit* OR life expectan* OR terminal OR terminally OR palliat*)))

Google Scholar

Google Scholar search 2 - ask the question

("ask | asked) the question") ("would you be surprised" | "would be surprised" | "would not be surprised") (death | die | dies | dying | mortality | terminal | terminally | palliative) (health | healthcare | medical | hospital | hospice | cancer)

About 83 results (**0.10 sec**) **6 citations selected** (limited to 2015-2016)

PubMed-NOT-Medline

Search	Query
#7	Search (#4) AND (((publisher[sb] NOT pubstatusnihms NOT pubstatuspmcsd NOT pmcbook) OR inprocess[sb] OR pubmednotmedline[sb] OR oldmedline[sb] OR ((pubstatusnihms OR pubstatuspmcsd) AND publisher[sb]))) Filters: Publication date from 2015/10/01 to 2016/12/31 Sort by: PublicationDate
#6	Search (#4) AND (((publisher[sb] NOT pubstatusnihms NOT pubstatuspmcsd NOT pmcbook) OR inprocess[sb] OR pubmednotmedline[sb] OR oldmedline[sb] OR ((pubstatusnihms OR pubstatuspmcsd) AND publisher[sb]))) Sort by: PublicationDate
#5	Search ((publisher[sb] NOT pubstatusnihms NOT pubstatuspmcsd NOT pmcbook) OR inprocess[sb] OR pubmednotmedline[sb] OR oldmedline[sb] OR ((pubstatusnihms OR pubstatuspmcsd) AND publisher[sb])) Sort by: PublicationDate
#4	Search (((((((terminally ill OR terminal Care OR palliative OR hospice)) AND ((surprise OR surprised OR surprize OR surprized)) AND ((questions) OR question)))) OR (((((end-of-life) AND ((surprise OR surprised OR surprize OR surprized)) AND ((questions) OR question)))) OR (((surprise OR surprised OR surprize OR surprized)) AND (((questions) OR question) AND (survival rate AND mortality AND time factors)))) OR (("surprise question" OR "surprise questions") AND end-of-life) OR ("surprise question" OR "surprise questions")) OR ((end-of-life) AND ((surprise OR surprised OR surprize OR surprized)) AND ((questions) OR question)))))) OR #3 Sort by: PublicationDate
#3	Similar articles for PubMed (Select 27695853)
#1	Search (((((((terminally ill OR terminal Care OR palliative OR hospice)) AND ((surprise OR surprised OR surprize OR surprized)) AND ((questions) OR question)))) OR (((((end-of-life) AND ((surprise OR surprised OR surprize OR surprized)) AND ((questions) OR question)))) OR (((surprise OR surprised OR surprize OR surprized)) AND (((questions) OR question) AND (survival rate AND mortality AND time factors)))) OR (("surprise question" OR "surprise questions") AND end-of-life) OR ("surprise question" OR "surprise questions")) OR ((end-of-life) AND ((surprise OR surprised OR surprize OR surprized)) AND ((questions) OR question)))))) Sort by: PublicationDate

Part 2: Rationale behind judgments of risk of bias using the Quality in Prognosis Studies tool¹

Domain 1: Study Participation.

We assigned a higher risk of bias to studies that did not indicate the size of the eligible population ²⁻⁵, or those with a low participation rate ⁶. We also assigned a higher risk to studies with missing SQ data for enrolled patients; we assigned a high risk to studies where the incidence of missing data was comparable to the incidence of death ^{6,7}, and a moderate risk to a study where the incidence of missing data was substantially lower than the incidence of death ⁸.

Domain 2: Study Attrition.

Pang et al. ⁹ reported that the outcomes were censored for 10 patients due to transplant and 9 patients due to conversion to hemodialysis. These patients (especially the latter) were still at risk for death; however, we assigned only a moderate risk of bias, given that the exclusion rate was substantially lower than the overall incidence of mortality.

Domain 3: Prognostic Factor Measurement.

Since many studies involved more than one evaluator, the SQ was not administered exactly the same way to each patient. However, since this is an intrinsic property of the test, we did not assign a higher risk of bias due to this consideration.

Domain 4: Outcome Measurement.

Only one study provided details about how the outcome (dead or alive) was confirmed at the end of the study⁵; for the other studies, we assumed that the investigators had confirmed the outcome in an appropriate manner (such as direct contact with family members or verification in medical records). One study described an 18-month enrolment period that was the same as the study period, suggesting that patients enrolled near the end of the study may not have had complete follow-up, so we assigned a moderate risk of bias ¹⁰.

Domain 5: Study Confounding.

Since the SQ is intended to trigger a discussion about goals of care or hospice and palliative care, there is a risk of self-fulfilling prophecy in any study where the SQ might lead to a decision to withhold or withdraw life-sustaining measures that would result in mortality. This phenomenon would enhance the measured prognostic performance of the SQ. We assigned a moderate risk of bias to studies of dialysis ^{7,9,11-14}, critical care ¹⁵ and respiratory disease ² (where mechanical ventilation is often considered) for this reason, because withholding or withdrawing life-support could result in mortality in these situations. Although studies generally did not provide data to suggest a high incidence of new decisions to withhold or withdraw life-sustaining measures after the SQ, one study reported 22/28 deaths due to withdrawal of dialysis or unknown causes, so we assigned a high risk of bias to this study. We assigned a low risk of bias to studies of cancer patients ^{3,8} or in

primary care⁵ since there is no evidence that involving HPC in general or using less aggressive chemotherapy is associated with a shorter survival ¹⁶.

Domain 6: Statistical Analysis and Reporting.

For this domain, we assigned a low risk of bias to all studies. Although some studies did perform multivariable analyses, we were only interested in 2x2 tables of SQ vs. mortality.

1. Hayden JA, Cote P, Bombardier C. Evaluation of the quality of prognosis studies in systematic reviews. *Ann Intern Med.* 2006;144(6):427-437.
2. Reilly L, Reilly K, Mc Closkey M, et al. Prognostic Significance of the 'Surprise Question' in an Respiratory Inpatient Population in a DGH. *Irish Journal of Medical Science.* 2013;182:S484-S484.
3. Moroni M, Zocchi D, Bolognesi D, et al. The 'surprise' question in advanced cancer patients: A prospective study among general practitioners. *Palliative Medicine.* 2014;28(7):959-964.
4. Vick J, Pertsch N, Hutchings M, et al. The utility of the Surprise Question in identifying patients with cancer most at risk of death: preliminary results. American Society of Clinical Oncology Annual Meeting; October 2015, 2015.
5. Lakin JR, Robinson MG, Bernacki RE, et al. Estimating 1-Year Mortality for High-Risk Primary Care Patients Using the "Surprise" Question. *JAMA Intern Med.* 2016.
6. Barnes S, Gott M, Payne S, et al. Predicting mortality among a general practice-based sample of older people with heart failure. *Chronic Illn.* 2008;4(1):5-12.
7. Cohen LM, Ruthazer R, Moss AH, Germain MJ. Predicting Six-Month Mortality for Patients Who Are on Maintenance Hemodialysis. *Clinical Journal of the American Society of Nephrology.* 2010;5(1):72-79.
8. Moss A, Lunney J, Culp S, Abraham J. Prognostic Significance of the Surprise Question in Cancer Patients. *Journal of Pain and Symptom Management.* 2010;39(2):346-346.
9. Pang W-F, Kwan BC-H, Chow K-M, Leung C-B, Li PK-T, Szeto C-C. PREDICTING 12-MONTH MORTALITY FOR PERITONEAL DIALYSIS PATIENTS USING THE "SURPRISE" QUESTION. *Peritoneal Dialysis International.* 2013;33(1):60-66.
10. Feyi K, Klinger S, Pharro G, et al. Predicting palliative care needs and mortality in end stage renal disease: use of an at-risk register. *BMJ Support Palliat Care.* 2015;5(1):19-25.
11. Moss AH, Ganjoo J, Sharma S, et al. Utility of the "Surprise" question to identify dialysis patients with high mortality. *Clinical Journal of the American Society of Nephrology.* 2008;3(5):1379-1384.
12. Da Silva Gane M, Braun A, Stott D, Wellsted D, Farrington K. How robust is the 'surprise question' in predicting short-term mortality risk in haemodialysis patients? *Nephron Clin Pract.* 2013;123(3-4):185-193.
13. Amro OW, Ramasamy M, Strom JA, Weiner DE, Jaber BL. Nephrologist-Facilitated Advance Care Planning for Hemodialysis Patients: A Quality Improvement Project. *Am J Kidney Dis.* 2016;68(1):103-109.
14. Carmen JM, Santiago P, Elena D, et al. Frailty, surprise question and mortality in a hemodialysis cohort question and mortality in a hemodialysis cohort. *Nephrol Dial Transplant.* 2016;31:i553.
15. Khan S, Hadique S, Culp S, et al. EFFICACY OF THE "SURPRISE" QUESTION TO PREDICT 6-MONTH MORTALITY IN ICU PATIENTS. *Critical Care Medicine.* 2014;42(12S):S402.
16. Temel JS, Greer JA, Muzikansky A, et al. Early palliative care for patients with metastatic non-small-cell lung cancer. *N Engl J Med.* 2010;363(8):733-742.

