Acute coronary syndromes

Jim Christenson and colleagues,[1] in their article about emergency department assessment of chest discomfort, state that chest pain evaluation units "are cost-effective relative to admitting all low-risk patients to coronary care units but have never been compared with the unstructured diagnostic approach used in most Canadian hospitals." However, more evidence for chest pain units has recently become available.

In a randomized controlled trial and economic evaluation, my colleagues and I compared a chest pain unit with routine care in the United Kingdom.[2] Routine care consisted of an unstructured diagnostic approach, with hospital admission or discharge at the discretion of the physician. The chest pain unit was associated with fewer hospital admissions (37% v. 54%, $p < 0.001$), improved quality of life, and trends toward a lower proportion of those with acute coronary syndromes being discharged (6% v. 14%, $p = 0.26$) and lower health service costs (£478 v. £556, $p = 0.25$). Overall, the chest pain unit appeared more effective and more cost-effective than routine care.

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In a well-structured study on the contentious subject of emergency department assessment of chest discomfort, Jim Christenson and associates[1] conclude that the "miss rate" for acute coronary syndromes (ACS) was 5.3% at 2 Vancouver hospitals, more than 2 ½ times that of our US counterparts.[2]

At first glance, this is devastating news. However, certain points might benefit from clarification. For example, of the 21 patients with ACS who were discharged from the emergency department, most had a diagnosis of chest pain not yet determined or atypical chest pain. But how many of these were discharged with empiric antianginal treatment (e.g., acetylsalicylic acid or nitroglycerin as required) and had definitive follow-up? Would such treatment of this subset of patients, if at low risk for ACS, not meet the standard of practice?[3,4]

In the ACS patients whose condition was truly missed, what were the negative consequences of not being admitted from the emergency department? In the one case of death, what was the temporal relationship between death and the ACS diagnosis? In other words, is it likely that the outcome would have been prevented by admission on the index visit? Also, were there other adverse events in this subset of patients and, if so, is it likely that admission would have averted their occurrence?

The authors refer to the study by Pope and colleagues[2] as the standard. However, I believe there are significant differences in the design of that study that would reduce the number of missed diagnoses. For example, those authors included all critically ill patients, whereas Christenson and associates, because of consent issues, did not. Pope and colleagues used only creatine kinase data in making the diagnosis, whereas Christenson and associates also used the data from the more sensitive and specific troponin assay. Pope and colleagues did not employ diagnostic data such as an outpatient stress test or angiogram results to capture more patients, but Christenson and associates did. I believe that if the design of the US study were to be used on the study population examined by Christenson and associates, the percentage of missed diagnoses would be considerably lower than 5.3%.

Once it is clarified whether appropriate treatment was rendered to the "missed" group after discharge and whether admission would have prevented any adverse events, then the significance of the 5.3% figure, in isolation, can be gauged.

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[Four of the authors respond:]

The study by Steve Goodacre and his colleagues[1] addresses the issues of safe and efficient discharge decisions for patients with chest pain. Their data suggest that a chest pain unit is cost-effective compared with routine care in a British emergency department. However, the population in that study appears very different from that of most US chest pain units, especially in terms of the high admission rate after evaluation in the chest pain unit, and it would be difficult to compare the patient population in our study[2] with the population in the British study.[1] The Canadian health care system is substantially different from both the US and the UK models, and we maintain that a combination of sensible and safe early discharge combined with an efficient rule-out protocol would be more efficient than mandating that a large number of

low-risk patients enter a US-style chest pain program, including stress testing before discharge.

Brian Steinhart has concerns about the proportion of missed patients who had anti-ischemic treatment or follow-up diagnostic testing (or both). Our definition of missed patients included only patients who were discharged without any anti-ischemic treatment and without specific follow-up evaluations or testing booked. In only 1 of the 21 cases did the patient end up, many days later, in a cardiology clinic, but we could not confirm any predischarge planning for this appointment. The definition of clinically significant adverse outcomes is an interesting one. The single patient who died had significant comorbidity, and the death was not unexpected. However, 10 of the 21 "missed" patients had a 30-day diagnosis of acute myocardial infarction (AMI). One had an elevated troponin level known by the treating physician but discounted as a false positive. The others re-presented with evidence of myocardial necrosis, and it is likely that the index presentation was unstable angina that could have been treated more appropriately (and the AMI potentially averted). There appears to be no consensus on whether this should be considered inappropriate management; however, our position is that the diagnosis of acute coronary syndrome should be made with the greatest possible accuracy on initial presentation and that each missed case is inappropriate.

We agree that there were differences in methods between our study and that of Pope and colleagues.[3] We did not include some critically ill patients, but these patients by definition would not be missed. They may have had a small impact by increasing the denominator modestly. Steinhart contends that if we had used the methods outlined by Pope and colleagues, our rate of missed cases would have been lower than 5.3%. Although this is probably true, the question is which method is more appropriate. We prespecified detailed definitions for AMI and definite unstable angina and followed up patients very carefully and therefore are confident in underscoring our rate of missed acute coronary syndrome.

We encourage others to measure outcomes in patients with chest pain and challenge all to develop consensus on a more appropriate definition of clinically significant missed acute coronary syndrome.

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Rethinking diabetes care in Canada

In a study published last year in *Canadian Family Physician*, Harris and associates[1] found evidence that many Canadians with diabetes are not being monitored appropriately: 16% had not had their glycosylated hemoglobin (A1C) level tested in the preceding year, 85% had not been assessed for diabetes-related foot conditions, and more than half had not had their lipids tested. Clearly we are doing something wrong.

The Canadian Diabetes Association (CDA) published state-of-the-art clinical practice guidelines[2] in the same year as the Harris study appeared. These guidelines are a tremendous resource, but I am concerned that they will not improve the delivery of diabetes health care unless we abandon the traditional top-down approach and replace it with a bottom-up strategy.

What would such a bottom-up strategy entail? We should ensure that diabetic patients become intimately familiar not only with the traditional tenets of diabetes education (e.g., proper nutrition and exercise therapy, blood glucose testing) but also with traditionally physician-centric issues such as target levels for A1C, lipids, microalbumin and certain clinical parameters including blood pressure and 10-g monofilament testing. There is no reason that patients cannot be knowledgeable enough to ask their physicians if they should be taking acetylsalicylic acid or an angiotensin-converting enzyme inhibitor or a statin or to ask about — and be engaged in discussions regarding — the implications of abnormal clinical parameters (such as impaired 10-g monofilament sensory awareness).

That the guidelines are available online[3] is helpful, but because they are written for a professional audience, many people with diabetes are unlikely to use them. So how about an online lay version of the guidelines? Why not encourage pharmacists to distribute CDA-designed information sheets instead of noncontextual (and at times alarmist) lists of potential adverse drug effects? Why not duplicate the American-based Lower Extremity Amputation Prevention (LEAP) program,[4] which distributes free monofilaments for patient (and professional) use? Or even enclose a monofilament and instruction sheet with every new prescription for an oral hypoglycemic agent?

I believe that Canada could be at the forefront of a change to bottom-up diabetes management in the same way that we have been (and continue to be) at the forefront of diabetes research. And I believe that such a change will create a better informed, more engaged and, ultimately, healthier diabetes patient population.

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