

Cost: It's all in the eye of the beholder

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In a past missive, we started to examine the process of capital budgeting at the hospital level and illustrated the principle with a relevant example (1). Intimately tied to this example was the idea that we need to spend money to save money. In our example, we detailed a purchase and demonstrated how the savings gleaned outweighed the expense, justifying the cash outlay. In doing so, we quantified the cost of a purchase from the perspective of the hospital administrator.

To be honest, we used the term 'cost' loosely when we really meant 'expense'. It is loose substitutions such as these that muddy the waters of cost comparisons. To some extent we quantified the cost of a surgical procedure, but did we really calculate the cost of the intervention?

At the recent Canadian Society Meeting held in Calgary (Alberta), practicing staff and trainees presented an unprecedented number of articles exploring, estimating and comparing treatment on the basis of cost (2). Contrast this to presentations from before the economic crash of 2007 (3). Many argue that cost should factor into all research protocols moving forward. Granting agencies agree. Cost analysis not only ensures that care is delivered in a cost-effective manner, but it also ensures that care can continue to be delivered at all; we are sitting on the cusp of an era in which physicians will need to argue effectively to continue to ply their trade (4). But how do we decide how to calculate cost, and from whose perspective?

PERSPECTIVE IS EVERYTHING: THROUGH WHOSE EYES SHOULD WE INTERPRET THE PROBLEM?

There is more than one side to every story. We routinely and falsely try to boil stories down to two sides, but most have many players, all with individual stakes in the outcome. The same is true of cost. We cannot make decisions with cost calculations made from only one perspective. If the money spent saves money for the department of surgery but the cost incurred by the department of medicine rises as a result, the intervention will not gain much traction with the CFO. Similarly, if we save money for the hospital, but increase the out-of-pocket costs for the patient, their insurer or their employer, are we able to say that the intervention was cost effective? Costing that benefits one at the expense of another is simply cost shuffling or interdepartmental reallocation, not necessarily true savings.

THERE IS NO FREE LUNCH

In a single-payer health care system, deferring costs to the patient is one way to shore up the budget in the short term; however, these savings may emerge as comparable or increased expenses later down the road. If the amount the average citizen spends on health care rises dramatically, the rise will be reflected in inflation, earnings will need to increase to match that rise and we may not be any further ahead in the long run.

Michael Porter, a well-known researcher in competitive business strategy, has turned the focus of his career to health care more recently. He made his mark in the business world by touting the importance of value (5). He believes the solution for health care ills lie in a value-based system; at the root of this philosophy is a simple formula (6):

$$\text{Value} = \text{Health outcomes} / \text{cost of delivering outcomes}$$

The simplicity of the formula is the source of its appeal as a starting point. When we are sitting down to design a research protocol and begin to consider how we should capture cost, begin with this formula.

The numerator states that the goal of the treatment needs to be the return to health, nothing less encompassing, and yes, it is a grand but relevant end point. At the root of this goal is the idea that it costs less to take care of healthy people and, therefore, interventions that improve health, save money. If we simply analyze treatment on a less lofty goal, we cannot truly understand total cost. Looking at the denominator, we see that the cost quantified is the cost of achieving better health, not just the cost of the intervention. If we do not analyze the big picture, we cannot draw any comprehensive conclusions.

HOW DO I EVEN BEGIN TO QUANTIFY THE TOTAL COST IMPLICATIONS?

Accountants divide costs into two categories: direct and indirect. The direct costs of a surgical procedure are easy to quantify. These tend to be the only ones included in rudimentary cost analyses. These direct costs are always documented from the perspective of the institution. Examples of direct costs include sutures, equipment, drugs, surgeon and anesthesia fees levied, etc.

The indirect costs get tied up in overhead costs of the institution. Relatively easy examples include utilities, nursing salaries and intraoperative delays. We need to account for difficult-to-quantify items such as unexpected hospital admissions. The classic error made when quantifying the indirect costs of an intervention is tallying costs only from one perspective. Indirect costs are universally under-reported in the literature because the patient covers the vast majority of these costs (7).

Recovering from surgery interferes with a patient's ability to earn income. A self-employed patient bears this cost alone, or shares it with his or her family. An employee shares the cost of their recovery with their employer or insurer as a result of missed days of work, modified duty or disability claims. Layoffs generate social assistance claims and indirectly consume tax revenue. Caregivers are hired at an expense, or family members act as caregivers, in turn sacrificing income or costing their respective employers income through caregiver days claimed. The trickle-down cost of decreased productivity and increased insurance premiums is carried by the greater economy and everything gets overwhelming pretty quickly.

BUT HOW DOES THE NOTION OF VALUE FIGURE INTO ALL OF THIS?

Intimately tied to the notion of value is the idea of quality. The value of the intervention includes the patient's perception of the quality of the outcome. Quality cannot be imposed; the perception of quality comes from the patient. This perception is influenced by the indirect costs of the procedure that the patient covers. A patient who

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undergoes a technically successful procedure but loses his job as a result of a protracted recovery may not perceive the outcome to be a success. Fortunately, there is a metric by which we can – and must – analyze the quality of the intervention: quality-adjusted life years (QALY). If we combine QALY with total social costing – direct and indirect – we can start to compare interventions by integrating cost analysis in our research protocols.

How about an example to solidify the theory?

We are all familiar by now with the introduction of Xiaflex (Actelion Pharmaceuticals Inc, USA) as an alternative treatment for Dupuytren's contracture. Any clinician who has broached the subject with patients will also be aware of the consternation with which the treatment is met by patients on the basis of cost. What we do know for certain is that the drug is less expensive in Canada than in the United States, but is the price justified? If so, are there savings to be realized by choosing Xiaflex over surgery at the current price? If we are able to calculate the total social cost and integrate the patient's perception of the quality of the treatment on their health outcome, we may be able to actually choose the best treatment for Canadians – not the cheapest, but the best.

Why reinvent the wheel?

Baltzer and Binhammer (8) have already performed this type of analysis in detail. They performed a cost-utility analysis of the different treatment options available for Dupuytren's disease in Canada. This work was originally presented at the Canadian Society Meeting held in Toronto (Ontario) in 2012, one year before the price of Xiaflex was set. They compare traditional surgery, percutaneous aponeurotomy and Xiaflex on the basis of cost – direct and indirect, from the patient and health care system perspective – integrating QALY effectiveness threshold costing in their analysis.

Needle aponeurotomy was the most cost-effective treatment, followed by collagenase injection, followed by fasciectomy. The article assumes that all surgeons are trained in needle aponeurotomy, which may not be the case. For those who use the traditional surgical approach, they demonstrate a clear treatment advantage for injection over traditional surgery even when working under the assumption that American pricing would be used in Canada and while likely overestimating the number of doses required for the treatment of a single cord contracture. What is even more interesting is that by using QALY to determine cost effectiveness, they calculated that Xiaflex became cost effective at CAD\$1,250 per dose, almost exactly the price ultimately

used by the company when it was brought to market. This is likely not a coincidence and the fact that the makers and authors arrived at the same market price shows that these calculations are consistent, and work.

The article is an excellent example of a thorough cost analysis that enables us to begin asking questions about how we treat this disease when cost and quality are integrated into treatment algorithms. Should we use this information to fund training in needle aponeurotomy to decrease disease management costs for the system, or should we use this information to justify covering the cost of Xiaflex in practices in which the only alternative to injection is surgery?

NOT THAT WE'RE HARPING ON, BUT BACK TO THAT PERSPECTIVE THING

Perspective is everything in cost. Canadian patients regard themselves as having two management options for their disease: expensive or 'free'. When patients use Xiaflex, it is a win-win situation from the perspective of the Ministry of Health. The patient or their insurer covers the cost of the drug. No money is spent on the surgical management of a disease that falls within the scope of the schedule of benefits. What about the cost from the perspective of the insurance companies, many of whom chose to cover the cost of the drug? Likely these same insurers would be on the hook for temporary absence disability claims, postoperative splinting and analgesics costs, and when the analysis is performed from their perspective, the single-dose purchase ultimately results in savings over the long run.

Of course the Canadian health care system does not cover medication, a major fault according to many. As we move forward, cost analyses similar to this could be used to change the face of universal coverage and facilitate the emergence of a hybrid system. When an emerging medical management option replaces surgery, total cost analysis could be invoked and drug coverage contemplated when the treatment option saves both the health care system and the greater economy money.

The outcomes of this type of rigorous analysis would also favourably impact the patient's perception of care. Returning to Porter's simple formula, the combination of an improved health outcome in the numerator and a decreased cost in the denominator must result in a rise in the value delivered by the system.

DISCLOSURES: Neither Dr McKay nor Dr Peters have used Xiaflex®, and have no ties to Actelion Pharmaceuticals Canada Inc.

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