

Stephen S. Rauh
Eric Wadsworth
William B. Weeks

the fixed-cost dilemma what counts when counting cost-reduction efforts?

A hospital's fixed costs are a reality that can make the idea of achieving savings by reducing length of stay illusory.

AT A GLANCE

- > The high fixed-cost structure of hospitals and the predominance of "joint costs" mean few truly variable costs can be captured by small or incremental cost reduction strategies.
- > Many of the proxy metrics used to measure cost savings, such as length of stay and readmissions, typically does not reflect true cost savings, but should be seen as measures of additional capacity with the potential for added revenue.
- > To achieve true savings, hospitals should consider reducing capacity when possible and making better use of the remaining capacity, increasing throughput, and reducing costs per discharge.

For the same reason that there is an almost universally recognized need to reform the nation's healthcare system, hospitals today perceive the importance of quality improvement (QI). With costs trending upward toward eventually unsustainable levels, the industry is hard-pressed to find ways to reduce costs while improving quality of care. But the fundamental challenge is in knowing where QI efforts should be directed to achieve the necessary results.

Health care has been taking its lead from businesses around the world, which have made QI their core strategy, resulting not only in vastly improved products and services but also lower costs and increased operating efficiencies. The healthcare industry adapted proven QI methodologies used in the business world, such as Six-Sigma, Lean, and Deming's PDSA (Plan, Do, Study, Act) approach, to its own efforts to improve clinical quality and patient outcomes, while lowering costs. Progress has been steady. But cost containment has remained elusive.

That's not to say savings have not been reported from QI efforts. The following comments are typical of the types of savings often cited:

- > "Our QI project reduced length of stay, saving more than 300 bed days a year, which, at \$1,300 per bed day, amounts to an annual savings of \$390,000."

- > "In our family practice, we reduced readmissions for our CHF patients, saving the hospital almost \$200,000."
- > "We have eliminated hundreds of unnecessary MRIs, saving the radiology department over \$250,000 for the year."

Such claims sound impressive. But the actual savings almost never seem to make it to the hospital's bottom line or show up in a reduced budget. If the improvements are real, why are true cost savings so difficult to realize?

There are two key reasons: First, the high fixed-cost structure of hospitals and the predominance of "joint costs" mean there are few truly variable costs that can be captured by small or incremental cost reduction strategies. And second, many of the proxy metrics used to measure cost savings, such as length of stay (LOS) and readmissions, typically do not reflect true cost savings but should be viewed as measures of additional capacity with the potential for added revenue.

The Realities of a Hospital's Cost Structure

In a hospital, labor and supplies, both clearly variable costs in the long run, typically account for well over half of total operating expenses. Labor costs (salaries and benefits) are often 50 to 60 percent of total operating expenses, with direct supply costs representing an additional 10 to 15 percent. Superficially, this high variable cost component suggests that hospital expenses should be quite sensitive to changes in patient volume, and a saved bed day should result in real dollar savings. Further, if that bed day can be

saved without any reduction in revenue, hospital profitability should also improve. Unfortunately, in practice, much of the seemingly variable costs in hospitals are relatively fixed in the short run, making it difficult to generate true cost savings.

Hospitals treat a wide variety of patients with different medical conditions and typically are organized into specialized ancillary services, such as laboratory, radiology, pharmacy, dietary, respiratory, blood bank, dialysis, emergency department, or physical/rehabilitation therapy. This structure is efficient because the same resources can be used to support the treatment of a wide variety of patient health conditions, and significant economies of scale can be created. Because these ancillary units serve many different patients, their operating costs are referred to as joint costs. The principal downside of this structure is that staffing in these specialized services is largely insensitive to changes in patient volume, effectively turning what would normally be considered a variable cost (labor) into a fixed cost.

Nursing is the only area where labor costs are potentially directly related to patient volume. However, even nursing is insensitive to modest volume changes and is best characterized as a semivariable cost with potential savings from reduced patient volume described by a step function.

For instance, if you assume that one nurse could cover five patients in a typical med-surg unit, it would be necessary to eliminate 1,825 bed days of care per year ($5 \text{ beds} \times 365 \text{ days} = 1,825 \text{ bed days}$) in a single nursing unit to be able to reduce the staff on that unit by one nurse per shift, saving perhaps \$300,000 per year in salary and benefits. If these 1,825 saved bed days were spread across several nursing units, then no staff savings would likely be realized.

Effectively, direct supply costs are the only truly variable costs in a hospital that can be directly tied to patient volume and to cash expenditures. In fact, eliminating those bed days of care will increase the per unit costs for the remaining

patients, because the same fixed costs must now be spread over the new, lower volume.

This small amount of truly variable costs gives hospitals a tremendous amount of "operating leverage," meaning the hospital's profitability is very sensitive to changes in patient volume.

When volume is reduced, the hospital loses 100 percent of the patient revenue but saves only the cost of direct supplies. When volume increases, the next patient is highly profitable since revenue is captured but the true cost of caring for the next patient on a nursing unit is relatively small, as the additional cost is limited to direct supplies. As a result, management's attention shifts to utilization and throughput, the driving force in any fixed-cost industry (consider the airline industry where "good management" focuses relentlessly on flying with full loads).

Consider another, more extreme example.

Imagine that to better service the spine center, a hospital's radiology department purchases a third magnetic resonance imaging (MRI) device with annual depreciation of \$250,000. Although the machine has other associated costs (technicians, electricity, etc.), let's assume this is the only cost the hospital is responsible for managing. Running two shifts per day, six days per week, the radiology department can run almost 10,000 scans per year, for a cost of \$250 per scan. Now assume best practices change and the literature shows that 30 percent of the scans are unnecessary and can be eliminated. This year, the department uses the new machine for only two scans—what a savings! Except that each of those scans carries an obscene cost of \$125,000. As a fixed cost, depreciation is incurred whether the machine is used or not.

Many health policy analysts cite the fee-for-service payment system as the source of escalating healthcare costs, suggesting it creates an incentive for volume growth. True, but the payment system is only part of the story. It would be more accurate to say that the cost structure of hospitals with their high operating leverage is what creates the incentive to grow patient volume. The payment system is a necessary contributor, but fee

To count saved bed days as true savings, it is necessary to demonstrate that the saved bed day translates directly into a reduction in cash expenses.

for service would not encourage volume growth if the next patient was not profitable.

If the traditional volume-driven business model in health care is in its twilight and some version of capitation or a global budget is likely to take its place, hospitals should make reducing their operating leverage a strategic priority to gain greater flexibility. Reducing operating leverage in a traditional hospital organizational structure is challenging because it means converting fixed costs into truly variable costs. Outsourcing is one strategy that is often employed, as is internal reorganization to increase staffing flexibility.

Reducing Cost or Creating Capacity?

The nursing unit claiming \$390,000 in savings from a reduction of 300 bed days a year is using total cost to calculate savings. Cost accountants determine the total cost of an inpatient bed day by adding up all the direct fixed and variable costs associated with inpatient beds over the course of a year and dividing this sum by the number of available bed days. The total cost per bed day can be a useful metric if examining the growth in inpatient costs over time or comparing costs versus benchmarks. It is highly misleading, however, when used to measure the cost impact of changes in bed utilization.

In contrast to total cost, the marginal cost of one bed day is the change in true variable cost associated with one more or one fewer bed days and is normally the proper metric to use when measuring costs in most QI projects. In most instances, a change in true variable cost would be reflected in a change in cash expenditures. Small changes in

bed day utilization will have no impact on direct fixed cost such as facilities and equipment, nor are most semifixed costs likely to be affected.

Depending on the staffing level in the unit, nurse staffing could theoretically be affected, but under most circumstances, one bed more or less is unlikely to result in a staffing change. So if all the costs are essentially fixed for small changes in bed days, the marginal savings from a reduced bed day is close to zero, other than direct supply costs that would be captured as a reduction in cash expenditures.

So what is the true value of a saved bed day?

To count saved bed days as true savings, it is necessary to demonstrate that the saved bed day translates directly into a reduction in cash expenses. Normally, this result can be accomplished only by permanently removing enough beds from service to allow at least one nursing position to be eliminated on the unit. Absent the direct link to a reduction in cash expense, reliance on proxy metrics to measure savings can be highly misleading.

In the initial example, if over the coming year the saved bed remains empty for 300 days, the cost savings is quite small, as virtually all the costs are fixed and only direct supply costs are saved. As noted earlier, by saving the 300 bed days, the largely fixed costs of the nursing unit are now shifted to the other patients, raising the total cost of the remaining beds. If the reduction in LOS results in reduced revenue, the saved bed day actually creates an operating loss for the hospital since the lost revenue exceeds the savings in supply costs. Permanently closing beds and reducing staff may be the only way a saved bed day can create true savings.

Alternatively, if backfill volume can utilize the empty bed for those 300 days, there will be no change in cost. The nursing costs are the same as they were before the bed day savings were achieved, so no additional cost is incurred to care for the backfill patient and none of the fixed costs

are shifted to other patients. So on the cost side, nothing has changed.

However, the saved bed day now contributes additional revenue. In fact, the bed day portion of the revenue for this patient is virtually pure profit because little additional marginal cost is incurred—just direct supply costs. The value of the saved bed day is not reduced cost; rather, the saved bed day creates capacity to accommodate an additional patient. Nonetheless, with one additional discharge in the same cost structure, the efficiency of resource utilization has improved, and the cost per discharge decreases.

Clearly the primary benefit of saved bed days depends on the availability of backfill volume. If there is no backfill, cost savings are limited because the nursing unit's costs are largely fixed, and there may be a loss in revenue due to the shorter LOS. If there is a backfill patient to occupy the bed, again there are no cost savings, but additional revenue is captured improving hospital profitability and lowering per patient and per discharge cost measures. If the goal is reduce cost rather than increase capacity, the saved bed will likely have to be closed permanently to realize meaningful savings.

These concepts have powerful application in this era of healthcare reform. A major tenet of reform argues that as much as one-third of the care delivered is unnecessary waste. Eliminating those unnecessary procedures, so the argument goes, would save the system millions of dollars. On the contrary, as this analysis of the fixed-cost dilemma indicates, reducing volume will result in very limited savings, with the lower volume required to cover the fixed costs associated with low utilization. The "right sizing" of health care in a reformed system will require a significant reduction in physical capacity to align cost structures with new patterns of patient service needs.

How Can You Truly Reduce a Hospital's Costs?

If hospitals truly want to reduce the cost of delivering care they will need to:

> Reduce their operating leverage to the extent

possible so that costs are more sensitive to changes in patient volume

- > Avoid confusing capacity creation with cost savings
- > Avoid, whenever possible, the use of proxy metrics to measure cost savings unless the proxy savings can be directly linked to reduced cash expenses
- > Focus cost-saving efforts on direct cash expenditures such as reducing supply costs, lowering labor costs, and making better use of fixed assets to reduce future capital investment needs

Meaningful payment reform still seems elusive, but hospitals need to be thinking strategically about how they can adapt their high fixed-cost structures and volume-driven business models to a new world where reimbursement may be wrapped in global budgets and capitated payments and where the goal will be to keep patients out of the hospital. To that end, hospitals should rethink capital budget expansion plans and instead consider capturing the value of QI processes by reducing capacity when possible and making better use of the remaining capacity, increasing throughput, and reducing costs per discharge. ■

About the authors



Stephen S. Rauh, CFA,

is an associate, Office of Professional Education and Outreach, The Dartmouth Institute for Health Policy and Clinical Practice, Hanover, N.H. (stephen.rauh@tdi.dartmouth.edu).



Eric Wadsworth, PhD, CPA, CFP,

is a principal, Office of Professional Education and Outreach, The Dartmouth Institute for Health Policy and Clinical Practice, Hanover, N.H., and a member of HFMA's New Hampshire-Vermont Chapter (eric.wadsworth@tdi.dartmouth.edu).



William B. Weeks, MD,

is a principal, Office of Professional Education and Outreach, The Dartmouth Institute for Health Policy and Clinical Practice, Hanover, N.H., and a member of HFMA's New Hampshire-Vermont Chapter (wbw@dartmouth.edu).

Copyright of hfm (Healthcare Financial Management) is the property of Healthcare Financial Management Association and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.