Making the BUSINESS CASE

Part 1: A financial primer for infection preventionists

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INFECTION PREVENTIONISTS (IPS) are often asked to provide a business justification for their proposals. As clinical experts, however, they may lack the business knowledge to articulate the financial benefits needed to convince decision makers.

This article is part one of a two-part series. Part one will enhance IPs' knowledge of the business side of healthcare by describing the general business model that drives hospital financial performance, explaining how revenues and expenses behave as they combine to yield profits or losses, and demonstrate how improvements in infection control can result in positive "bottom line" results, thereby enhancing the probability of approval for various initiatives that reduce infections.

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THE HOSPITAL BUSINESS MODEL

The first step in providing a business justification is to understand the hospital business model. How does the "bottom line"—the profit or loss of the organization—come about? What starts the ball rolling? How do revenue, cost, volume, staffing, equipment, and other elements combine to drive the financial condition of the organization? Perhaps the best way to answer these questions is to start at the end: the "bottom line."

The profit or loss of any organization is based on revenues and expenses. Simply stated, if the revenue exceeds the expenses, the result is a profit. If the expenses exceed the revenue, a loss results. But how does the revenue get to exceed cost? What causes revenues and expenses to rise or fall?

Figure 1 visualizes the connections from profit or loss back to its genesis: volume. Volume can be described as patient days, admissions or cases, surgical cases, procedures, test, exams, or any other term for the activities causing work to be done (directly, for specific patients, a radiology procedure, for example; or indirectly, in a way that benefits groups of patients, maintenance on an MRI, for instance). Lacking some sort of volume, there is no activity.

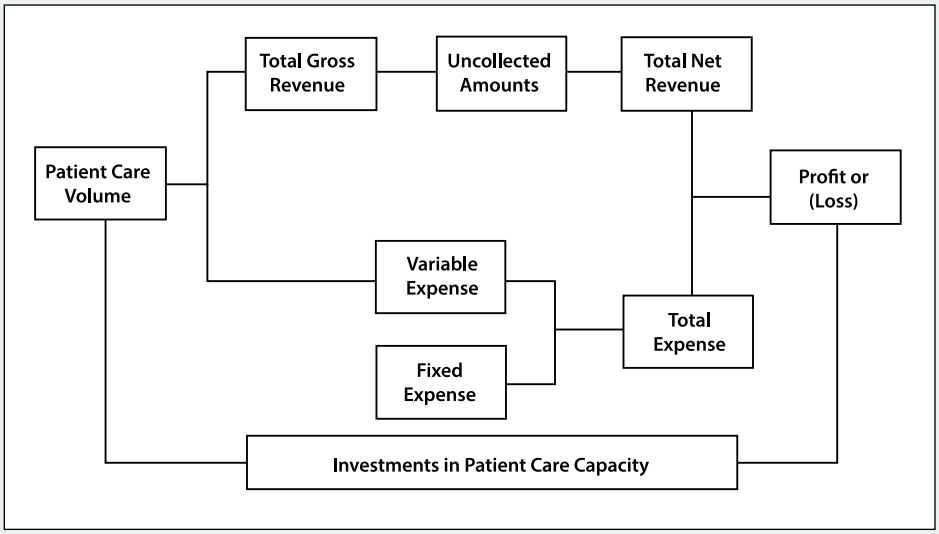

Figure 1 – The hospital business model begins with patient care volume and circles back through the financial performance again to patient care volume in a continuous loop. Infection control initiatives impact all elements of the model.

Volume multiplied by price equals gross revenue—the amounts put on patient bills. If the price, sometimes referred to as the charge, for an outpatient visit is $450, then 100 such visits yield gross revenue of $45,000. Hospitals are never paid the billed amount. Medicare, Medicaid, United, Blue Cross, and the rest, take significant discounts, often paying less than 50% of the bill. These write-offs are referred to as contractual adjustments. Self-paying patients are expected to pay the face value of the bill unless the provider offers them a discount, as is often the case for very large bills. When they do not pay, these write-offs are categorized either as bad debts (patients who could pay but choose not to) or charity care (those patients who just cannot afford to pay). The result of these write-offs is net revenue—the gross revenue *net* of the write-offs.

The combination of revenues from inpatient stays (room and board, lab tests, diagnostic procedures, IV infusions, and so on), outpatient visits, and the like are all combined to yield total net revenue—gross revenue from all services, net of write-offs. It is important for business decisions to focus not on what is billed, but rather on what is collected—the net revenue.

Volume also influences operating expense. While much of expense spending is fixed and does not change when volume rises or falls, some expenses, like medications, IV fluids, infusion sets, catheters, etc., do go up when volume rises and down when volume drops. Again, as with revenue, volume is the main driver of these expenses. Total expense is the combination of the fixed expenses (most labor, interest, depreciation, and some supplies) and the variable expenses.

The revenues (money coming in) and expenses (money going out) are combined and result in profit or loss. Profits allow the organization to maintain infrastructure, invest in new services, grow existing service lines, purchase new technologies, and generally expand its capacity to provide services to patients. In turn, this expansion in capacity allows the organization to provide more services to patients, and in so doing, grow volume.

If properly managed, the organization finds itself in a success loop. Again, as illustrated in Figure 1, volume leads to profits, which leads to increased capacity, which leads to increased volume. The cycle repeats, and the organization continues to grow and prosper. It should be pointed out that the key to success is growth—volume. Failing to grow is no different for an organization than for a human being. A diagnosis of failure to thrive (grow) for a newborn is quite troubling. Organizations that do not grow often go out of business entirely or are acquired by others. Successful hospital turnarounds in Maryland and Massachusetts, for example, found their genesis in increasing the volume of patient care services.[1]

Years ago, the Baltimore City Hospitals, now Johns Hopkins Bayview Medical Center, had amassed over $70 million of operating losses over a 10-year period. It was on the brink of closure because of its significant drain on the city's coffers. The turnaround to profitability was achieved not by reducing cost, but rather by increasing volume. Admissions and revenue grew by 20% per year, and the bottom line quickly turned from red ink to black ink.

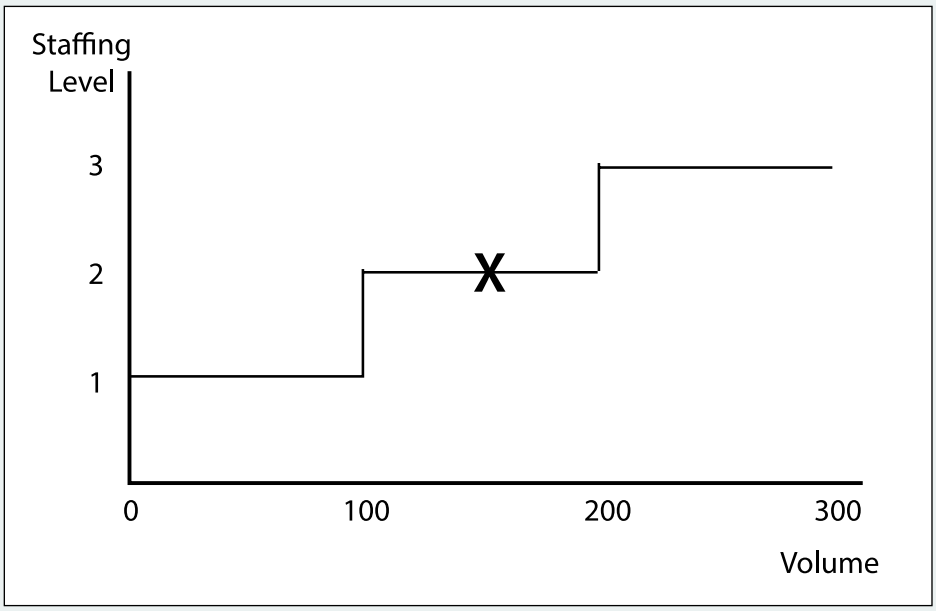

Figure 2 – Semi-variable costs are those that are generally fixed, but at certain levels of volume vary sharply before becoming fixed again. They are typically associated with dramatic changes in the scope of work as opposed to more routine modest volume growth.

REVENUE AND EXPENSE BEHAVIOR

Hospital operating costs generally fall into three broad categories. Fixed, variable, and semi-variable. Semi-variable is sometimes referred to as "step cost" because of the way it looks when plotted on a graph.

Fixed costs hold constant regardless of increases or decreases in volume. Costs can include such things as salaries, office supplies, utilities, interest paid on hospital debt, and the depreciation of a hospital's fixed assets (scanners, hospital beds, etc.). With rare exceptions, these costs do not change when volume rises or falls.

Variable costs rise and fall as volume rises and falls. These costs include such things as medications, IV supplies, patient drapes and gowns, exam gloves, and so on. Generally, more of these items are consumed as volume rises while fewer are consumed as volume declines.

Semi-variable costs are fixed over a range of volume, then vary sharply before become fixed again. These costs are a bit of a wild card and are associated with changes in scope of services. Consider the example of an outpatient clinic treating 100 patients a day. A staff complement of three people (a physician, a nurse, and a technician) handle this level of volume, treating 40, 80, or 100 patients a day. That staffing level represents fixed cost. But if the scope of business changes by the addition of a second group of 100 patients, another entire complement of staff will be needed. Thus, from the 101st patient up to and including the 200th patient, a second physician, nurse, and tech will be needed. The staff cost is fixed for the first 100 patients, then varies totally to handle the second group of 100 patients. In this way, fixed cost becomes variable with the addition of the 101st patient and then becomes fixed again until the 201st patient is added to the daily volume. In economic terms, this is an example of a diseconomy of scale—that 101st patient is extremely expensive and, frankly, financially disadvantageous because there will only be one added unit of revenue, but enough added cost to handle 100 patients.

Figure 2 illustrates this concept and the reason they are often referred to as step costs. As shown, one cohort of staff (doctor, nurse, and tech) can treat up to 100 patients. From 101 to 200, another entire cohort is needed and, again, from 201 to 300, a third such cohort is required. In certain forms of

statistical analysis, one can assume a position at the midpoint of a normal distribution curve. So, too, in business it can generally be assumed that, lacking definitive information to the contrary, the organization is positioned at the midpoint of any of the horizontal volume plateaus (the large X in the figure). Based on this reasonable assumption, a modest increase in volume will not require an expansion of fixed costs. It will, however, add revenue and the hospital will profit from the increase in volume.

For the most part, hospitals are managed and decisions are made based on costs being either fixed or variable. The semi-variable costs can't be forgotten, but their presence is a relatively rare occurrence.

Overwhelmingly, total hospital operating costs are fixed in nature (Table 1) with a smaller amount being comprised of variable costs. At the department level, the proportions can be quite different. Nursing units can be 90-95% fixed because of the intensity of their labor costs. The pharmacy may be split 50/50, with labor being 100% fixed and the medications 100% variable. The operating rooms, given the high cost of implanted devices and other surgical supplies, are largely variable. Some departments like finance and administration are 100% fixed.

Are these proportions the same for every hospital? Certainly not. Does it matter if a hospital has slightly different proportions—say 85% fixed and 15% variable? Again, the answer is no. What is important is that hospitals are high fixed cost organizations. This reality provides financial leverage for improvement initiatives that increase volume and the associated revenue (100% variable with volume), while costs do not grow as rapidly (only 10+/-% variable with volume). A 10% increase in volume and revenue may be accompanied by only a 1% or 2% growth in cost, thus improving profitability.

In contrast to this, revenue is almost entirely variable with volume. The issue here is the reimbursement methodology. While some care is paid for on a fee-for-service (FFS) basis (the more services provided, the higher the bill and the payment), most care is covered by case-based reimbursement, led by Medicare and Medicaid. In excess of 60% of reimbursement is case-based nationally, while some organizations experience higher levels of case-based reimbursement. The remaining FFS business can include self-pay patients who are expected to pay 100% of their bill directly, and discounted FFS in which a third-party payor negotiates a discount off the hospital's published charges. A small number of payments, primarily to small, safety net hospitals, are cost based.

Consider, for example, a patient admitted to the hospital for coronary artery bypass graft surgery. A fee-for-service payor will get a bill of $70,000 or more depending on length of stay and the use of ancillary services. That payor will pay that bill based on pre-negotiated discount arrangements. If the patient is in hospital longer, the bill, and the discounted payment, will be higher. If the patient is discharged sooner or with less use of ancillary services, the bill, and its discounted payment, will be lower. Medicare, on the other hand, cares little about length of stay, ancillary usage, or the actual bill. It pays a flat amount based on the diagnostic coding regardless of the reality of services provided.

DRIVING THE BOTTOM LINE VIA INFECTION CONTROL

Improvements in infection control almost always have a positive impact on a hospital's financial condition. The literature demonstrates that infections have a significant and negative effect on length of stay. A methicillin-resistant *Staphylococcus aureus* infection can add roughly 10 days to a patient's time in hospital.[2] Catheter-associated urinary tract infections, central line-associated blood stream infections, and *Clostridium difficile* infections similarly add many days to the length of stay. Events such as these block beds, reducing available capacity, and eliminating the hospital's ability to admit other patients. Those missed admissions also mean missed revenue.

A number of financial benefits result from reductions in hospital-associated infections and any improvement to clinical quality and patient safety. These include improvements to available operating capacity, cost efficiency, cost reduction, throughput and revenue generation, and balance sheet strength. Intangible improvements are also achieved.

Available operating capacity: Patients occupying beds for longer than necessary because of infection block beds, thereby reducing the hospital's capacity to admit new patients. Reducing infections shortens length of stay and increases available bed capacity. This increased capacity can be used to admit more patients, thereby increasing revenue. And since most cost is fixed, very little added cost is incurred by these new, incremental admissions.

Cost efficiency: Since operating costs are largely fixed (perhaps as much as 90% fixed), total operating cost can be spread among more patients—the current ones and the incremental ones added because of unblocked beds. The result is lower cost per admission or cost per case. Simply stated, the same amount of cost divided by the increased number of cases yields reduced cost per case.

Before reduction in infections:
$15,000,000 of operating cost ÷ 1,000 cases = $15,000 per case

After reduction in infections:
$15,150,000 of operating cost ÷ 1,100 cases = $13,773 per case

In this case, a 10% increase in cases (the denominator) accompanied by a 1% change in overall operating cost (the numerator) results in an 8.2% reduction in cost per case. This is the sort of operating efficiency finance leaders appreciate. Note that the operating costs grow only slightly owing to the low proportion of variable costs.

Cost reduction: Sometimes, a reduction in infections does not result in increased admissions; no incremental cases are added. In this

Table 1
Distribution of Overall Hospital Operating Costs by Type; Percentages by Category

Cost Category	Total	Fixed	Variable
Salaries & Fringes	65%	60%	5%
Supplies & Services	15%	10%	5%
Interest	10%	10%	
Depreciation	10%	10%	
Total	100%	90%	10%

"BY UNDERSTANDING THE BUSINESS SIDE OF HOSPITALS AND THE ELEMENTS THAT DRIVE HOSPITAL FINANCIAL PERFORMANCE—THE REVENUES AND EXPENSES—PRACTITIONERS WILL BE BETTER ABLE TO DEVELOP A PROPER BUSINESS CASE AND DEMONSTRATE HOW IMPROVEMENTS IN INFECTION CONTROL CAN IMPROVE THE PROFITABILITY OF THEIR ORGANIZATIONS."

case, a lasting decrease in workload can result in a potential staff reduction. If the average census drops from 50 patients per day to 40 and remains at that level because of a reduction in infections, the nursing unit can be downsized. The reduction of 10 staffed beds out of 50 yields a potential staff reduction of 20%. One major caveat: If the unit is short staffed to begin with, the potential for achieving this staff reduction is limited and may, in fact, not be achievable at all.

Some supply cost reduction is also possible as patients empty beds sooner. The variable costs associated with patient days can be reduced. But only the variable cost (perhaps as little as 10% of the average cost per patient day) will be reduced.

Throughput and revenue generation: Because reducing infections shortens length of stay and increases bed capacity, throughput (the movement of patients into and through the hospital) improves. This can allow for a reduction in operating room case cancellations (along with the associated reimbursement penalties) and an increase in highly profitable surgical cases. Because more of the existing beds are available for use, emergency department divert hours can be reduced and the revenue that might normally bypass the hospital can be captured. Elective cases can be admitted sooner rather than being delayed.

Balance sheet strength: Because the added revenue eventually converts to cash and is added to the balance sheet, funds are more readily available for equipment purchases and other investments, and the need for borrowing to increase capacity or to invest in new programs may be reduced. The millions of dollars invested in brick and mortar (i.e., facilities) and high-cost equipment is maximized.

While many of the benefits of infection control initiatives are quite tangible, measured in hard dollars and cents, a few are harder to place a monetary value on. Nonetheless, there is value to be obtained from them, and even the intangible benefits can have an indirect financial reward. To use a culinary analogy, they are not the steak, but they are the béarnaise sauce that accompanies the steak.

The intangible benefits include reduced malpractice claims owing to better patient outcomes; better reputation in the community, resulting in improvement in market share associated with improved clinical quality and patient safety; and higher satisfaction scores among patients, their families, and the hospital staff.

CONCLUSION

IPs develop initiatives that reduce the incidence of infection, improve patient outcomes, and support the overarching notion of "first, do no harm." They are often asked to describe the business case for approving their proposals and might be at a loss as to how. They may rely on literature, which promises massive reductions in cost, but in reality, does not meet expectations.

By understanding the business side of hospitals and the elements that drive hospital financial performance—the revenues and expenses—practitioners will be better able to develop a proper business case and demonstrate how improvements in infection control can improve the profitability of their organizations. In so doing, they enhance the probability of approval for their proposals and, in turn, improve the care patients receive in their hospitals. PS

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