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The New Economics of Healthcare:

Evaluating Medical Technologies Based on Actual Value as a Growth Strategy for Healthcare Providers

A Frost & Sullivan White Paper
With the I-Flow ON-Q® Pain Relief System as a Case Study

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FROST & SULLIVAN'S RESEARCH ON NEW TECHNOLOGY ADOPTION BY HOSPITALS IN THE CURRENT ECONOMY

As a growth consulting company with a focus on the healthcare marketplace, Frost & Sullivan has significant interest in the dynamics behind new technology adoption by healthcare providers. In April/May of 2009, Frost & Sullivan administered a Web survey to 70 hospital professionals in six different functional areas probing them on strategic challenges facing their institutions and the process by which they evaluated and adopted new technologies. In addition, Frost & Sullivan conducted extensive interviews with a variety of physicians and hospital professionals in a variety of different roles.

Figure 1 - Profile of Respondents to Frost & Sullivan Survey of Hospital Professionals

Title	#
Case Manager	4
Director/ Manager of Finance	10
Director/ Manager of Infection Control/ Epidemiology	10
Director/ Manager of Legal/ Risk Assurance/ Quality Assurance/ Safety/ Compliance	8
Director/ Manager of Materials Management/ Central Supply	23
Director/ Manager of OR/ Peri-Operative/ Surgical Services	15
Total	**70**

The objectives of this paper are to:

- Show how forces in the healthcare industry should change the way hospitals evaluate new technologies based on the *actual* value they deliver
- Describe the process hospitals currently use in the evaluation and adoption of new technologies
- Describe how hospitals currently think about operating cost management and value, particularly when evaluating the adoption of new technologies that might have an impact on patient outcomes
- Show how forward-thinking providers are changing the way they act on this value equation to position themselves for survival in their markets
- Provide an in-depth case study of one of the cutting-edge technologies that Frost & Sullivan believes represents a good example of this changing paradigm, the ON-Q® Pain Relief System from I-Flow

EXECUTIVE SUMMARY

U.S. hospitals are rapidly entering a crisis due to growing demand, decreasing reimbursement and dwindling investments and donations:

- An April 2009 survey conducted by the American Hospital Association reported that 7 out of 10 hospitals have seen a decline in their financial health since the recession began (1.)

- Even more than in the past, the financial viability of many hospitals is in question. Thomson Reuters reports that as of the beginning of 2009, half of U.S. hospitals were operating in the red with the median profit margin below zero percent (2.)

- Eighty percent of hospitals had reduced their capital equipment budgets between October 2008 and March 2009, at an average of an 11.9 percent decrease for the year. (3.)

Hospitals are also focusing on lowering their operating costs by reducing labor costs and lowering supply expenses. While hospitals continue to be squeezed financially, demand for improved patient outcomes and satisfaction continues to grow driven by payors, government, competitive pressures and patients themselves.

A point of agreement in the debate over healthcare reform has been that a provider's *economic* viability should be closely tied to the outcomes it delivers and how it manages its productivity and workflow. In Frost & Sullivan's survey, all but one respondent agreed that in the next five years it will be more important to the *economic* health of hospitals to deliver improved clinical and financial outcomes. Forty-nine percent of respondents indicated it would be *significantly more important* to deliver outcomes better than what they are presently offering. If nearly every hospital professional surveyed can agree on this point, they would also likely agree that reaching those outcomes goals while maintaining profitability and operational efficiency is a major challenge. In order to meet this challenge, hospitals must break down department-centric purchasing silos and make decisions that are in the best interest of the patient and facility as a whole. What good is it if an OR is running profitably if the entire hospital is going bankrupt at the same time?

Incentives to promote continuous improvement and a reduction in process variations will soon be directly incentivized by the Federal government. A final healthcare reform package is likely to include some variation of value-based purchasing (VBP) which would score

providers based on quality performance and patient satisfaction. Under some proposed plans, those providers with the highest scores would receive bonuses taken from a pool of dollars all providers would contribute into built from withholdings taken from their Medicare reimbursement. Lower performing hospitals would not receive a bonus, and would, effectively, be paying for the bonuses of higher performing hospitals. A recently published article in the monthly magazine of the Healthcare Financial Management Association (HFMA) states that the best way for a hospital to improve its VBP score will be to reduce process variances at both the departmental and enterprise level. (4)

Approximately 82 percent of survey respondents believed that in the next five years, the U.S. healthcare system will transition further away from traditional fee-for-service billing and to more capitated, bundled payment approaches where payors pay providers fixed amounts for the care of patients. Hospitals can expect to see Medicare and other payors roll out new payment bundling rules and to reimburse providers for managing larger patient pools and incentivizing them to keep patients healthy. In essence, payors will be further incentivizing providers to deliver more value to patients and to be more efficient with the care they provide by stripping out non-standardized practices and technologies that are not evidence-based. More than one billion dollars directed by the federal government to fund comparative effectiveness research studies on clinical practices and technologies will also put greater pressure on providers toward this end.

Figure 2 - Frost & Sullivan's Picture of the Future U.S. Healthcare System

- Greater focus on economics
- Healthcare becomes more like other service industries
- Increased attention to patients as healthcare consumers
- Increased reliance on healthcare information technology
- Higher competition among healthcare providers both horizontally (hospital vs. hospital) and vertically (hospital vs. surgery center); more competition on a global basis for elective procedures
- Greater collaboration and information sharing across value chain
- Greater transparency of prices/ costs and outcomes
- Increased development of standards of care and incentives to adopt
- Increasingly challenging market for new technologies
- Longer time to market for new technologies
- More decision making on purchasing occurring at higher levels within a customer organization, at system-levels or by GPOs
- More locked out accounts and a more competitive market with customers signing longer-term, exclusive contracts to enjoy lower prices
- More "generics" – technologies providing same value at lower price, stripped down feature sets
- Greater focus on prevention and primary care

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Despite these challenges, many hospitals still have poor visibility and control over their *actual* revenues and costs. More facilities are looking for ways to take greater control over their financial destinies by changing what they can influence the most: their clinical operations and outcomes. Hospitals of the future will evaluate new technologies based on their impact on net positive cash flow, which will be more important than reimbursement for the product. Hospitals will become more like manufacturers by adopting best practices and standardized protocols that offer predictable outcomes in order to reduce variations in care and drive efficiency and quality. Products able to demonstrate these benefits, such as I-Flow's ON-Q® Pain Relief System, will be well-positioned to take advantage of these changes. The ON-Q is a non-narcotic, post-surgical pain relief device that reduces length of stay (LOS) and lowers costs.

Patient satisfaction is becoming a more important competitive differentiator among healthcare providers. This trend is being driven by greater public transparency into outcomes and satisfaction rates of hospitals and physicians available to patients via the Internet. As patients become better able to obtain information to guide their decisions, they will be more inclined to choose care delivered by providers with a demonstrated record of patient satisfaction. Many hospitals are taking steps to ensure that prior to discharge they can ensure patients will leave with a positive experience. This often means focusing on improving clinicians' communication and bed side manner, but it can also have very specific clinical implications related to quality improvement. A 2009 survey of more than 300 CEOs of hospitals and group practices indicated that improving quality and patient safety were the top priorities of providers for the next three years far eclipsing revenue cycle management, cost reductions and improving reimbursement. (5)

The Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) survey is a standardized, national, and publicly reported survey on patients' hospital experiences. The survey is an initiative of the Centers for Medicare and Medicaid Services (CMS,) and consists of 27 questions on hospital staff responsiveness, physician and nurse communication, cleanliness, noise levels, pain management and other variables. The HCAHPS survey, the now de facto survey tool for measuring patient satisfaction and driving performance improvement in hospitals, specifically surveys discharged patients on the quality of their pain management and its impact on their overall satisfaction ratings.

HealthGrades, a leading independent healthcare ratings organization compiling HCAHPS scores, reported on June 2, 2009 in a press release that those 15 percent of hospitals with the highest overall HCAHPS scores had 26 percent more patients reporting that their pain was well controlled compared to the bottom 15 percent of hospitals with the lowest HCAHPS scores. Products that improve patient satisfaction scores or other benchmarked metrics now have real economic value because of their ability to separate leading providers

from their competitors. The HCAHPS surveys have shown that effective pain management is a metric separating the nation's most competitive hospitals from other facilities. Technologies like the ON-Q that are able to improve patient satisfaction by providing pain reduction, fewer side effects, earlier ambulation and faster discharge should be seen as strategic opportunities for hospitals to establish themselves as market leaders.

Medicare is reportedly considering reforms which would bundle payments for hospitalization to cover a patient's initial stay as well as all care for a patient 30 days after release. The goal would be to incentivize hospitals to put more effort into ensuring patients receive all the care necessary to lessen the chance they will need to be readmitted. Approximately 18 percent of hospitalizations are currently readmissions costing the healthcare system billions of dollars (6). Clinicians and administrators interviewed by Frost & Sullivan who use the ON-Q report an increase in their hospital's efficiency. They are also able to turn beds more quickly and deliver more predictable and repeatable outcomes thereby lowering the risk for readmission among many patients.

"We have a set of financial incentives that encourage more care rather than better care," Peter Orszag, director of the Office of Management and Budget (OMB) in the Obama administration, told a Robert Wood Johnson forum last year. "In order to change that we need to do a lot more testing of specifically head-to-head comparisons of what works and what doesn't and we need to pay for what works and not so much for what doesn't." (7)

I-Flow's ON-Q is an example of the type of technology that provides *better care* in terms of improved clinical outcomes and operational efficiencies and reduces the need for *more care*, understood as all the side effects and costs related to the use of unnecessary systemic narcotics. The technology is supported by clinical evidence and the experience of more than two million surgeries. For the sake of our healthcare system and the viability of their institutions, hospital administrators must take a more active role in evaluating and adopting technologies that could help them better serve their patients and compete in the future.

----------End of Executive Summary----------

THE NEW ECONOMIC LANDSCAPE FOR HOSPITALS

Hospitals today are managing more patients, facing more competition from other hospitals or physician practices, seeing higher patient acuity levels, operating under higher costs, and meeting more regulations and requirements with less staffing, less time and less reimbursement. In addition, hospitals today operate under significantly higher transparency and accountability requirements than in the past. With the unemployment rate in June 2009 twice that of June 2007, the American Hospital Association reports that hospitals are providing more uncompensated care as emergency rooms become a cost center since uninsured patients often use it for primary care. Hospitals are witnessing reimbursement cuts across all payors, in particular Medicare patients who continue to be reimbursed at lower levels than commercial insurance patients. In those states, such as California, facing their own budget shortfalls, cuts to Medicaid programs will have a subsequent negative effect on hospitals as they deliver more under or uncompensated care. Meanwhile, the recession has ravaged the valuation of many hospitals' endowments. Gifts from benefactors have also decreased, and they are expected to remain down if Congress approves the Obama administration's proposal to reduce the level of charitable donations allowed as tax deductions (8,9.)

In addition, with patients having a growing degree of influence on which healthcare providers they choose, technologies that enable higher patient satisfaction hold the potential for bringing more profitable patients into the facility.

Having frozen the capital budgets necessary to expand their facilities, many hospitals are increasingly overburdened by their patient volumes, with census numbers often over their bed capacity levels. This challenge is making patient throughput and more rapid discharge a higher priority. "The current economy is actually increasing our admissions levels because there are more patients using our ER as their primary care physician, and because more members of the medical staff are sending their patients after hours to our ER for service," according to one hospital CEO interviewed by Frost & Sullivan.

To address these challenges, hospitals are focusing on revenue capture, boosting patient volumes, containing or cutting operating expenses and reprioritizing capital allocations. Hospitals are increasingly interested in improving productivity and workflow as they look for ways to reduce staff and maintain the same or greater patient volumes. This will have a significant impact on how hospitals evaluate the adoption of new technology. Those devices that provide clinical benefits, operational benefits, additional reimbursement and real cost savings will be successful. In addition, with patients having a growing degree of influence on which healthcare providers they choose, technologies that enable higher patient satisfaction hold the potential for bringing more profitable patients into the facility.

Why Leading Hospitals See Now as a Time to Invest in New Clinical Approaches

While hospitals continue to mandate budget freezes and roll out efforts to reduce costs, leading hospitals realize these efforts are not enough if clinical workflows are still business as usual. Nor is a focus on top line revenues enough either, although certainly valuable. These innovative hospitals are more interested in seeking out new service lines and practices that improve their profitability, cash flow, operational efficiencies and competitive position in their markets.

A 2008 Ernst & Young whitepaper based on interviews with hospital CEOs indicated that two of the five most important characteristics shared by high-performing hospitals are: an instinctive pattern of early adoption of new practices and technologies and a deep-seated understanding of the connection between clinical and financial outcomes (8.) As will be explained later, the ON-Q represents an opportunity for providers to achieve both of these goals. Leading hospitals have already adopted the ON-Q to improve outcomes and operational efficiency, reduce costs and become more competitive. Hospitals with the foresight and resilience to see opportunity in the changes around them and the willingness to try something new will emerge as the next generation of leading institutions.

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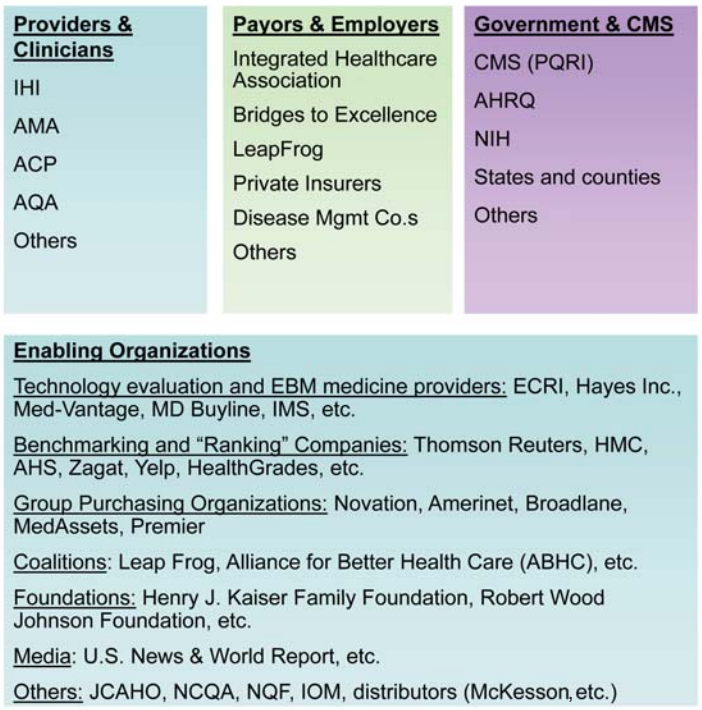
Hospitals Pressed to Deliver Greater Value to the U.S. Healthcare System

While clearly not ideal for patients, in the past and through to today, complications that result in longer stays and readmissions, in some cases, have been good economically for healthcare providers under a fee-for-service reimbursement model. Hospitals paid on a per diem or fee-for-service basis were disincentivized to reduce their patient length of stay (LOS.) Decisions on what type of tests to administer care to deliver or products to use are based on a fee-for-service incentive structure that encourages a short term, episodic approach to patient care, instead of looking at the true costs that hospitals incur in delivering patient care. The result is a tendency to favor and overuse reimburseable tests, procedures and products, and to disfavor non-reimburseable services or products, even if they provide very real economic benefits to providers in other ways.

New incentives and requirements for hospitals developed by payors and government entities are pushing providers to look at the cost equation differently. Outcomes and cost data for specific hospitals are becoming more transparent and publicly available encouraging providers to compete based on superior outcomes, lower costs and higher customer satisfaction scores. This transformation is being driven by:

- Pay-for-performance programs, such as CMS' Physician Quality Reporting Initiative (PQRI)
- Bonuses paid for higher HCAHPS survey scores
- CMS's non-payment for hospital acquired conditions (HACs) rolled out in October 2008
- Rapid growth in the number of websites offering hospital rating and benchmarking services
- Physicians themselves having to report personal quality measures when seeking recertification from their specialty boards as well

Figure 3 – Major Organizations Involved in Healthcare Provider Benchmarking, Quality Improvement and Transparency



Note: Not exhaustive.

In the last 20 years hospitals have begun adopting Lean and Six Sigma techniques, driven in part by a new generation of healthcare administrators with stronger business backgrounds. These administrators recognize the need for their industry to adopt best practices that deliver measurable, predictable outcomes with standardized protocols to reduce variations in care. More hospitals are incentivizing physicians to standardize their practices and technologies through gainsharing programs and benchmarking their outcomes and costs against their peers. Many hospitals are hiring physicians rather than contracting with them for the explicit purpose of gaining more control over the physicians' behaviors. The billions of dollars in the economic stimulus bill planned for investment in a more robust healthcare information technology infrastructure in the United States is expected to help make the adoption of standardized care protocols and tracking of outcomes easier.

In the past, non-employee physicians have had little incentive to standardize their practices or technology preferences, and hospitals have been reluctant to encourage them to do so out of fear of losing them to competing providers. Yet, more and more hospitals are adding salaried physicians and demanding that they, as well as their non-employed physicians, standardize to evidence-based best practice guidelines and technology selections which the hospital enforces. This trend toward standardization is necessary for reducing healthcare costs, improving outcomes and ensuring the long-term viability of hospitals.

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Evolving Healthcare System Reshaping the Cost Equation for Hospitals

In Frost & Sullivan's survey, hospital professionals said that over the next five years maximizing reimbursement and maintaining positive cash flow would remain top goals Hospitals also indicated it will be more important for their facilities to increase patient throughput and shorten length of stay in the next three years in light of their current bed capacity and average patient census numbers. Hospital professionals and physicians interviewed by Frost & Sullivan indicate that increasing throughput and decreasing LOS will become increasingly important as more payors begin to pay hospitals the same amount for particular DRGs whether the surgeries are performed on an inpatient or outpatient basis. Since outpatient surgery is nearly always less expensive to the hospital and frees up more staff and beds, hospitals are retooling many of their standards of care and workflow patterns to shift toward more outpatient surgeries.

Figure 4 – Importance of Various Hospital Goals Over Next Five Years

Survey respondents were asked to consider how important the following goals will be for their hospitals over the next five years compared to their current level of importance.

Rank	Facility Goal	Degree of Importance Over Next 5 Years
1	Maximizing reimbursement	Significantly More Important
2	Maintaining a positive cash flow	
3	Reducing incidence of infection and other hospital acquired conditions	Slightly More Important
4	Maximizing profitability	
5	Reducing cost per discharge	
6	Survival	
7	Ability to provide outcomes superior to those of competing providers	
8	Improving patient satisfaction scores	
9	Improving throughput	
10	Being able to provide predictable/ repeatable outcomes	
11	Reducing patient length-of-stay	
12	Standardization of care protocols	
13	Reducing post-operative pain and other related complications	

Source: Frost & Sullivan Hospital Professional Survey, April/May 2009

In the midst of this climate are signs that some hospitals are prepared to creatively and aggressively pursue new opportunities to replace falling revenue sources, or even invest for future growth opportunities. Hospitals seeking to improve their hospital's financial position and outcomes must consider "operating costs" in a broader sense than in the past, especially as reimbursement and incentives for their services change. Assuming a hospital's operating costs are all the materials, labor and overhead in the provision of services, then

saving operating costs can actually mean a number of different things:

- Reducing supply expenses achieved through price negotiations or eliminating supplies
- Reducing labor expenses achieved by managing nursing and other staff labor, reducing LOS, streamlining patient flow/processes
- Reducing complications that have a direct impact on costs of care by reducing mistakes, simplifying processes, and eliminating unnecessary tests, treatments and practices that have superior alternatives

Determining the cost-benefit of any new medical technology is a complex, and often murky, process that hospitals undergo, and it is likely going to be increasingly complicated in the future. However, just as changes in the healthcare system are underway to create more value, so too will hospitals need to evaluate new technologies on the actual value they can bring. Evaluating reimbursement for services and related technologies will continue to be critical when considering changes in what technology to adopt. Yet, Frost & Sullivan believes that determining the true ROI for a new technology will become more complex and reimbursement will become relatively less important compared to other variables for the following reasons:

- Reimbursement levels continue to drop across payors as technology costs continue to rise
- The mix of hospital patients continues to lean toward Medicare/Medicaid which pays less than commercial levels. The number of Medicaid enrollees will continue to grow due to the recession, high unemployment rates and expanding eligibility to more individuals, while the ranks of Medicare patients are being driven by the aging population.
- More care becoming capitated and shifting away from fee-for-service; more code bundling
- Increased mandates from payors, regulators and government linking outcomes to financial incentives (i.e. PQRI, HCAHPS, CMS HACs, etc.)
- Recognition that new care models (remote monitoring, "e-health") succeed in improving outcomes, but are often poorly reimbursed

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- Patient volumes putting more emphasis on workflow efficiencies, so technologies that help achieve efficiencies will be evaluated regardless of reimbursement

- What will matter more to hospitals is not necessarily the top line contribution a technology can bring but what value improvements it can bring in terms of outcomes, efficiency and cash flow

Hospitals reported the most common strategies for controlling supplies-related operating expenses were the use of group purchasing organization (GPO) contracts and efforts to eliminate "unnecessary" products. Negotiating lower prices through volume purchasing contracts is another popular strategy. To effect dramatic and significant improvement, leading hospitals are willing to make the investment to change how they deliver care and not simply operating within the status quo because it is easier to do and faster to implement. One of the most important investments is developing and enforcing clinical decision making standards rooted in best practices.

But hospital executives at the highest level must ask whether these strategies truly add value to an organization or whether they are the institutional equivalent of clipping coupons.

Figure 5 – Prevalence of Hospital Strategies for Reducing Supplies/ Device-Related Operating Expenses

Survey participants chose multiple responses.

Strategies Used for Reducing Supplies/ Device Related Operating Expenses	% of Respondents Using Strategy
Utilizing group purchasing organization (GPO) contracts	48
Eliminating unnecessary products	42
Purchasing volume agreements	38
Product consignment	35
Reducing number of vendors	31
Capped/ contracted pricing	29
Product bundling	23
"Physician alignment" - gainsharing, negotiation with physician to standardize	15
Regional buying co-ops	2
Committee to approve purchases of new items	2

Source: Frost & Sullivan Hospital Professional Survey, April/May 2009

Hospitals often overestimate the degree to which reductions in supply expenses actually benefit the facility in the long run. According to estimates from Credit Suisse based on interviews with major hospital systems, supplies only make up about 14.4 percent of the average hospital's operating expenses, far eclipsed by salaries and benefits which make up the greatest portion at 40.4 percent. In fact, supplies contribute only slightly more to operating expenses than bad debt at 11.2 percent. Hospital administrators should be asking what medical supplies and technologies are available which can help them lower labor costs and increase efficiencies, and not just what supply expenses they can eliminate (3.)

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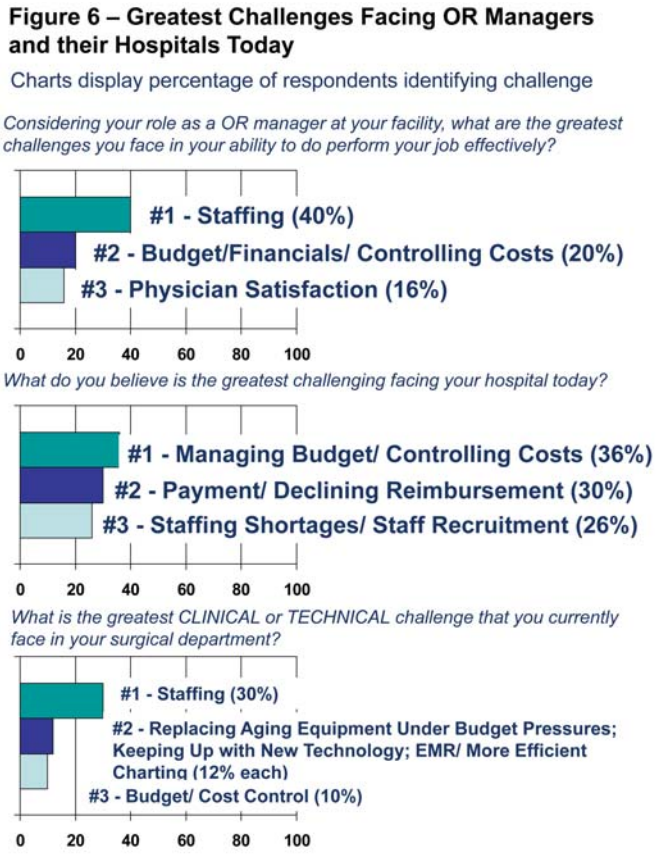
A survey of 50 U.S. operating room managers conducted in May 2009 by Frost & Sullivan found that staffing issues were the greatest challenges these professionals faced in the ability to do their jobs effectively. These managers went on to note that controlling costs and managing budgets was the greatest challenge facing their hospitals overall.

Figure 6 – Greatest Challenges Facing OR Managers and their Hospitals Today

Charts display percentage of respondents identifying challenge



Source: Frost & Sullivan OR Manager Survey, May 2009

These hospitals spent on average 22 percent of their operating budgets on supply costs, but surgical departments spent 42 percent of their departmental operating budgets on supplies The results are not surprising considering the disproportionately high consumption of expensive medical supplies and implants in operating rooms, but they highlight an important fact that is relevant to hospitals looking to trim their budgets. Because supplies make up a

much higher portion of their overall budget, surgical departments often turn to reducing supply costs first when pressed for savings whereas the overall facility typically looks to reduce salary and benefit expenses.

Figure 7 – Percentage of Operating Expenses Spent on Various Categories

Expense	OR Department	Total Hospital
Salaries & Benefits	37	44
Supplies	42	22
Bad Debt	4	9
Overhead	11	14
Other	5	11
Total	**100**	**100**

Source: Frost & Sullivan Hospital Professional Survey, April/May 2009

The tension between these two strategies holds the potential for problems. What happens when a surgical product is an added supply cost to the department but allows the facility to enjoy operational savings since it enables the facility to render the same or superior outcomes using fewer manhours? If a device subtracts from a surgical department's bottom line but allows hospitals to discharge a patient a whole day earlier, the net savings can be significant, particularly in a capitated reimbursement model. Frost & Sullivan's recent survey of hospital professionals found that the actual costs hospitals incur per day for inpatient surgical patients was approximately $1,657. While significant at a facility level, the surgical department might be resistant to assuming additional supply costs that impact their unit's bottom line, even if it is in the best interest of the facility overall. This situation sometimes creates a disincentive to use the technology since the two departments have conflicting interests. One hospital OR manager with experience managing this type of situation states, "The ultimate goal is to give the patient the best treatment option available. There are times where outcome outweighs cost - the expense can be made up in other ways."

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Most hospitals surveyed by Frost & Sullivan continue to track supply costs down to the departmental level and manage them with their own P&Ls, but the facilities often allocate more budget dollars to the unit to cover those costs. Some innovative hospitals are taking a broader perspective and looking at the overall cost of patient care at the "total encounter level." The economics of using a technology might not work out as favorably at a department level, but if it makes sense at a facility level then the technology should be adopted since that is the level that is going to matter the most in this new environment. Hospital administrators need to ensure that all their departments are operating with the same goal in mind – delivering the best patient care and contributing to the economic viability of their institution, with departmental autonomy subordinated where it makes sense. "If in the total patient outcomes picture, something helps improve the patient's perception of their stay with us, even if it means using something that is not reimbursable,

they will allow us to use it. Happy patients make for happy remarks in the community," according to one OR manager.

Being the complex organizations they are with myriad costs and variable reimbursement and other revenue streams, hospitals often find it difficult to calculate the true costs of the services they offer, which makes calculating profitability very complicated. Most hospitals surveyed did few calculations of actual costs for specific patient encounters. The more common approach hospitals used was averaging reimbursement or final payment by payors by DRG and subtracting usual and customary expenses (supplies, implants, equipment used, OR time, LOS and other costs.) "Indirect" costs are calculated only after direct costs are calculated and are typically subordinated to direct costs. Many hospitals had systems in place for capturing all costs related to care, but few had systems that were able to accurately track specific costs to specific care. Consequently, most hospitals have a very myopic perspective on what "costs" mean, despite the fact that forces are pushing hospitals to adopt a more long-term and comprehensive perspective toward patient care.

Across most hospitals, improving the profitability of patients is considered a responsibility shared by everyone. Yet, the responsibility lies heaviest with the hospital's finance department and case managers However, these individuals are often far removed from the decisions that have the greatest impact on patient profitability. These professionals often spend most of their time working to ensure the facility gets all the reimbursement it possibly can for whatever services happen to be provided during the course of care.

Figure 8 – Hospital Professional Spending Most Time Improving Patient Profitability

Survey respondents were asked to identify the title of the one person at their hospital spending the most time improving the profitability of every patient discharged. Approximately 39 percent of respondents indicated their CFO or other finance manager held that responsibility.

Rank	Title	% of Respondents
1	CFO/ Finance/ Controller/ Director of Business Office, Accounting or Billing	39
2	Case Manager/ Discharge Planner/ Utilization Review	24
3	CEO/COO	6
4	CMO/CNO	6
5	Director of Care Management/ Director of Patient Services/ Clinical Services	6
6	Director of Reimbursement/ Coder/ Compliance	6
7	Quality Manager/ Risk Manager/ Patient Safety	4
8	Director of Materials Management	3
9	Director of Performance Improvement/ Decision Support	3
10	Managed Care/ Contracts Manager	3
11	Director of Perioperative Services	1
	Total	**100**

Source: Frost & Sullivan Hospital Professional Survey, April/May 2009

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The Risk of Failing to Foster Innovation and Improvement in Patient Care

Hospitals are faced not with a problem related to costs, but with a problem of value, which includes costs as well as outcomes. Technology adoption is too often just a cost assessment and less often a value assessment. This makes sense based on how our healthcare system has traditionally operated; however, the industry is changing to one that is more focused on delivering value, which is a function of both costs and outcomes.

"What's important is that we measure and compare actual value — not just how much we spend on health care, but the performance we get back in return," said H. Edward Hanway, CEO of the insurance company Cigna, in reference to a report published on March 12, 2009 by the Business Roundtable.

As the outcomes that hospitals deliver become used as competitive measurements and a means for scaling compensation, facilities should ensure the technologies they adopt have an ability to deliver value specific to the metrics they are measured on. Frost & Sullivan's survey shows the majority of hospitals are benchmarking on a number of variables, including patient satisfaction, infection rates, length of stay (LOS), hospital acquired conditions (HACs) and readmission rates. The compensation of hospital management, physicians and staff are increasingly tied to these metrics, particularly patient satisfaction. With the introduction in October 2008 of CMS's HACs or "never events" that deny hospitals reimbursement for a variety of conditions, such as falls, infections and pressure ulcers, hospitals are also under new pressures that tie their facility's incomes to the outcomes they deliver.

Figure 9 – Prevalence of Hospitals Benchmarking on Particular Metrics

Benchmarking Metric	% of Hospitals Benchmarking
Patient Satisfaction	96
Infection Rates	94
LOS	86
Hospital Acquired Conditions (HACs)	84
Readmission Rates	79

Source: Frost & Sullivan Hospital Professional Survey, April/May 2009

Frost & Sullivan survey results indicate that the leading reason why hospitals evaluate and adopt new technologies is because of an observed clinical need followed closely by physician demand. Evaluating technologies based on their ability to reduce costs or improve operational efficiency is less common compared to these other motivating factors.

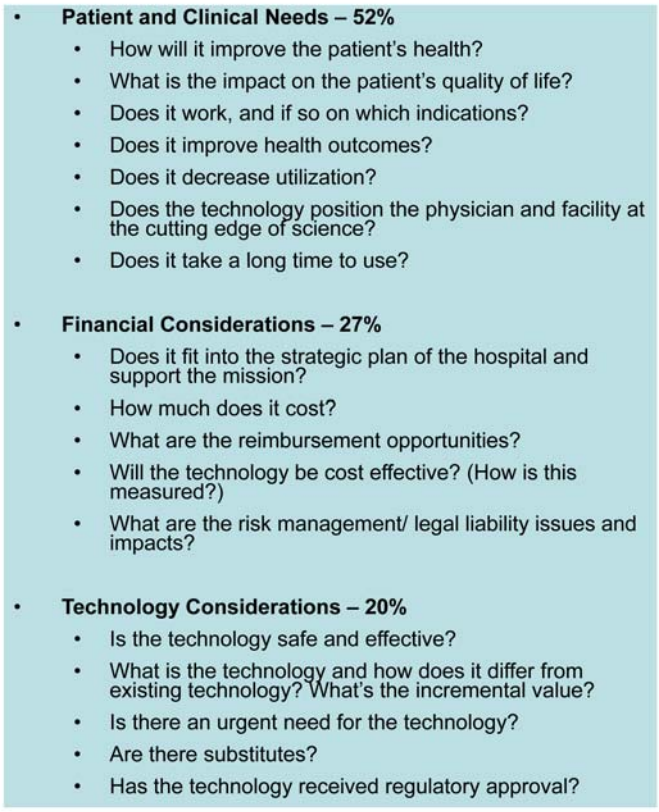
Figure 10 – Most Common Reasons for Hospitals to Evaluate New Technology

Rank	Reason for Evaluating New Technology	Frequency of Reason
1	Clinical need (as observed by your own department(s))	Somewhat common
2	Physician demand (i.e. an individual physician champion advocates for the technology)	
3	New revenue generation opportunity	
4	Improve productivity and efficiency of care	
5	Potential for risk/liability reduction	
6	Need for cost reduction	
7	Regulatory mandate	
8	Expansion of service lines	
9	Competitive pressures	
10	Opportunity identified by non-clinician	Common in very few instances
11	Prior sentinel event	
12	Interest from donors	
13	Requirement for clinical research	

Source: Frost & Sullivan Hospital Professional Survey, April/May 2009

When considering the adoption of a new technology, most hospitals go through a rigorous process of evaluation to understand the technology's relative benefits and costs.

Figure 11 – Relative Importance of Factors in Determining Hospitals' Adoption of New Technology



Source: Frost & Sullivan Hospital Professional Survey, April/May 2009

The initial and most important question providers usually ask is "How will this technology benefit my patients?" If the answer is positive, hospitals typically conduct a more in-depth financial and operational analysis on the technology to see whether the ROI for the technology exceeds the current standard of care. Politics often plays a major role in technology adoption as well, with technologies that are championed by leading physicians and other clinicians more likely to be picked up. Pressure from competitors, donors, regulatory entities, patients and the general community can also sometimes impact what new products are used. Frost & Sullivan's survey shows that for new, non-capital devices used in the surgical department, OR managers, surgeons, materials managers and infection control managers hold the most clout on deciding whether a technology is adopted.

Figure 12 – Influence of Selected Individuals Over Hospital-Wide Adoption of New, Consumable Clinical Product Costing $400 Used on Surgical Patients

Rank	Title	Degree of Influence
1	Director/ Manager of OR/ Peri-Operative/ Surgical Services	Moderate
2	Individual Surgeons	
3	Chair of the Department of Surgery	
4	Director/ Manager of Materials Management/ Central Supply/ Purchasing	
5	Director/ Manager of Infection Control/ Epidemiology	
6	Director of Med/Surg Department	Low
7	Individual Anesthesiologists	
8	Director of Patient Care Services	
9	CNO	
10	Chair of Department of Anesthesiology	
11	CFO	
12	Director/ Manager of Legal/ Risk Assurance/ Quality Assurance/ Safety/ Compliance	
13	CEO	
14	Director of Biomedical Engineering	
15	Director/ Manager of Finance	
16	CMO	
17	Hospitalists/ Intensivists	
18	COO	
19	Case Managers	
20	CIO	

Source: Frost & Sullivan Hospital Professional Survey, April/May 2009

Frost & Sullivan's research suggests that financial questions related to a new technology, such as reimbursability, only account for 27 percent of a hospital's decision as to whether to adopt that technology. While important to consider, most hospitals recognize that a technology's benefit to patients and the operations of the hospital outweigh the financial considerations themselves.

I-Flow's ON-Q® Pain Relief System as a Case Study for a Technology Driven by the New Economics of Healthcare

The ON-Q® Pain Relief System from I-Flow (Lake Forest, CA) is a portable, disposable pain relief drug delivery system that uses a small, balloon-like pump and catheter to automatically deliver local anesthetic near a patient's surgical site over the span of several days. The device can also be used as a continuous nerve block. The primary advantage of the system is the ability to substantially eliminate the need for post-operative, systemic narcotics in many patients. Consequently, patients do not experience as many of the related side effects associated with these narcotics, such as post-operative nausea and vomiting (PONV), respiratory depression, ileus, restricted ambulation, confusion, urinary retention and others. ON-Q is also labeled to deliver significantly better pain relief than narcotics alone. Research also suggests that a hospital's use of local anesthetics on patients, aggressive pain management, earlier ambulation and discharge, and avoiding use of opioids may lessen the risk of a patient developing a surgical site infection.

The primary advantage of the system is the ability to substantially eliminate the need for post-operative, systemic narcotics in many patients.

ON-Q has been shown in studies to provide:

- Savings of 30 percent of total costs associated with a surgical stay (11, 12)
- Tripling the number of patients discharged rating their satisfaction scores as "excellent" (13)
- Reducing incidence of surgical site infections (SSIs) by 55 percent (14)
- Reducing hospital LOS by 0.5 to 2.3 days depending on the procedure (14)
- Decreasing the number of patients suffering from postoperative nausea and vomiting (PONV) by 16 percent (15)
- Reducing patient opioid use per day as mg IV morphine equivalents (mg) by 39 percent (13)
- Reducing the number of patients requiring opioid rescue during infusion period by 38 percent (13)
- Decreasing visual analog pain scores by 30 percent (15)

ON-Q has been used in more than two million patients across many surgical specialties. Unmanaged pain and side effects from narcotics are leading reasons for hospital readmission, longer hospital stays and increased costs to providers and payors (16.) Devices like the ON-Q which can improve outcomes and provide operational and financial benefits will be critical to transforming healthcare in the future.

Frost & Sullivan's survey found that the average cost per day to a hospital for a surgical patient, and not the billable amount, was estimated at $1,657. Looked at from a purely economic perspective, if a hospital was reimbursed a fixed amount for a procedure, the ON-Q could potentially save a hospital on average $1,657, less the cost of the device, if it enabled a patient to be discharged only one day sooner. Any enabling technology like this that can help get a patient discharged earlier, if priced below the cost per day threshold, should be appreciated as a real profit generating solution regardless of whether it is reimbursed or not.

Devices like the ON-Q which can improve outcomes and provide operational and financial benefits will be critical to transforming healthcare in the future.

Figure 13 – Total Costs of Pain Management Alternatives to ON-Q®

Description	PCA Costs	Epidural Costs
Pump	$20-$50 per day	$20-$50 per day
Admin Set	$3-$5	$3-$5
IV Catheter and Tray	$10-$60	$10-$60
OR Time to Insert Catheter	-	$1,300 (30 minutes X $45 per minute)
Flushing Supplies	$10 per day	-
Pharmacy Fill of Narcotic Bag	$25-$100 per day	$25-$100 per day
Nursing Labor to Maintain	$50	$50
PONV Meds	$100+	$100+
Physician Charges to Maintain	-	$50-$100
Foley Catheter	-	$50
Narcotic Complications	?	?
Total 3 Day Cost	**$600+**	**$1,880+**

Source: I-Flow

Figure 14 – Equivalent Cost of One ON-Q® System

- The cost of one ON-Q system is equivalent to:
  - 4 hours of hospital stay, or
  - 12 minutes of ICU time, or
  - 4 ¼ hours of nursing time, or
  - 1 pharmacy refill of PCA medication, or
  - ½ day of PCA pain management, or
  - ¼ day of epidural pain management, or
  - 3 Zofran pills for PONV, or
  - 1 PT visit, or
  - 1/10th of a readmission
  - 1/50th of a hospital acquired infection

Source: I-Flow

I-Flow has more than 90 published or presented clinical studies that show ON-Q treats pain better than narcotics and lowers narcotic usage. Many studies also show a significant length of stay reduction. In an environment where hospitals are increasingly demanding they adopt evidence-based practices, the ON-Q has a strong precedent of demonstrating improved outcomes and patient satisfaction as well as operational and cost savings to providers. Frost & Sullivan asked survey respondents to identify the degree of clinical value they saw in the primary benefits that the ON-Q has been shown to deliver.

Figure 15 – Degree of Value Perceived by Respondents in Selected ON-Q® Benefits

Rank	Benefit of I-Flow ON-Q	Degree of Value
1	Tripling the number of patients discharged rating their satisfaction scores as "excellent"	High degree of value
2	Reducing incidence of surgical site infections (SSIs) by 55 percent	
3	Reducing hospital LOS by 1 day	Moderate degree of value
4	Decreasing the number of patients suffering from postoperative nausea and vomiting (PONV) by 16 percent	
5	Reducing patient opioid use per day as mg IV morphine equivalents (mg) by 39 percent	
6	Reducing the number of patients requiring opioid rescue during infusion period by 38 percent	
7	Decreasing visual analog pain scores by 30 percent	

Source: Frost & Sullivan Hospital Professional Survey, April/May 2009

Respondents indicated the same benefits would deliver positive economic clinical value to their facilities as well, with the top contributors being better satisfaction scores, shorter LOS and lower SSI rates. Survey respondents believed that the ON-Q could deliver a high degree of value to orthopedic surgery patients, but a moderate degree of value could also be delivered to the vast majority of surgical patients in their hospital.

Figure 16 – Degree of Value Brought by ON-Q® to Particular Surgical Specialties

Rank	ON-Q Application Area	Degree of Value Anticipated
1	Orthopedic Surgery	High
2	Colorectal Surgery	Moderate
3	General Surgery	
4	Trauma Surgery	
5	Urological Surgery	
6	Obstetrics/ Gynecology	
7	Cardiothoracic surgery	
8	Alternative to Epidurals	
9	Bariatric Surgery	
10	Plastic Surgery	

Source: Frost & Sullivan Hospital Professional Survey, April/May 2009

Reducing Patient Length of Stay

A recent report by Deloitte on the future of the healthcare industry stated approximately two-thirds of operating costs at hospitals are labor-related, and executives will be actively seeking new cost-savings opportunities in this area in 2009 (15.) The ability of a device like the ON-Q to reduce LOS has a direct effect on reducing labor costs related to caring for patients because of its ability to discharge patients sooner. With many hospitals struggling to manage growing patient volumes with their existing infrastructure, the ON-Q's ability to reduce length of stay has very specific benefits. Frost & Sullivan estimates that reducing LOS by only one day across all patients is the equivalent of adding 75 new beds to a hospital, assuming a 300 bed hospital at 85 percent census levels with an original, average LOS of 5 days.

Ramy Mankarious, M.D., an anesthesiologist using the ON-Q, states hospitals are more actively looking for new approaches that help reduce LOS as that metric and others may become increasingly mandated as performance measurements. He also notes that when ON-Q is used as part of a care protocol, certain procedures can be converted from inpatient to outpatient. In certain outpatient facilities, the placement of the ON-Q catheter can now often be billed as a separate facility fee from the surgery itself, allowing for added reimbursement for the facility. The hospital where Mankarious' anesthesia practice works adopted the ON-Q based on its ability to reduce LOS and improve patient satisfaction scores.

Improving Patient Satisfaction Scores

A manager of an orthopedic surgery department at a hospital using the ON-Q noted that in addition to the clinical benefits the ON-Q provides her patients, the ON-Q also helps to improve the hospital's HCAHPS scores which are benchmarked against all the other hospitals in her system. The ON-Q was first rolled out for use with orthopedic surgeries at her facility. According to the manager, many of these procedures are elective and patients are more likely to shop around for hospitals with better outcomes and higher customer satisfaction rankings prior to getting surgery. In order to bring more of these prospective patients into her facility, the department manager included the ON-Q as part of a larger performance improvement project to boost her hospital's quality and customer satisfaction scores thereby making her hospital more competitive. She noted that her knee and spine surgery patients using the ON-Q reported pain control scores significantly better than those without the ON-Q. "I think it is great that the consumers are taking control finally. That will actually hold the doctors and staff up to a higher standard too, because the consumer's expectations are high. So it is going to only help the hospital business," according to the manager.

"As far as the economics go, there is no question [the ON-Q] saves the hospital money," according to Michael McNelis, MD, an anesthesiologist with significant experience using the ON-Q for his surgical patients. McNelis notes the ON-Q was part of a new clinical approach to reducing LOS for his hospital's orthopedic surgery patients that has proven very successful. McNelis states that in addition to reducing LOS another driver for the adoption of the ON-Q was the device's ability to improve reported patient satisfaction scores related to pain management on HCAHPS surveys administered after discharge. He points out hospitals with HCAHPS scores in the top 10 percent of the country are entitled to an extra 2 percent bonus of their Medicare payments for that year. The second 10 percent of the population is entitled to 1 percent of their Medicare payments. In these difficult economic times, that bonus can help a great deal while the hospital also is encouraged to adopt a new practice to offer better patient care.

McNelis states that while putting an ON-Q catheter in place lengthens the case time, this time is "peanuts compared to the cost savings from the backend if patients can get discharged earlier." He goes on to say "I am so lucky at my hospital that they bought into the fact that it might cost them money to get [the ON-Q] up and running , but now we are seeing the back-end benefits of it."

Lowering Risk of Complications and Resulting Expenses

Joseph Kuhn, M.D., a general and bariatric surgeon using the ON-Q, reports that hospitals are under increased pressure to improve patient safety now more than ever since the non-coverage rules for hospital-acquired conditions (HACs) were introduced by CMS in October 2008. Kuhn reports that ON-Q is particularly valuable with his bariatric patients

"As far as the economics go, there is no question [the ON-Q] saves the hospital money," according to Michael McNelis, MD, an anesthesiologist with significant experience using the ON-Q for his surgical patients.

who have a higher risk for respiratory depression, so anything his practice can do to drop the patient's narcotic requirements to improve safety, reduce ileus, lessen PONV, and decrease pain is very valuable. He also indicates that use of the ON-Q eliminates the need for urinary catheterization and the associated risks for infection. He also has seen use of the system lessen the risk for herniation at the surgical incision site since patients are less prone to vomiting which increases abdominal pressure that causes ruptures at the surgical site. Kuhn's hospital is now able to perform gastric bypass surgery on an outpatient basis by using the ON-Q to control pain well enough to allow patients to return home much sooner than with traditional narcotics.

For the last four years, Randall Wolf, M.D., a thoracic surgeon performing minimally-invasive heart surgery, has been using the ON-Q on patients recovering after a "mini-maze" procedure instead of using epidurals or PCA pain management. In addition to less pain and earlier ambulation, he states the ON-Q allows for better respiratory dynamics and less ileus as well. Wolf believes the ON-Q generates notable cost savings by lessening the risk of deep vein thrombosis (DVT), lowering LOS, and generating higher patient volumes thanks to increased patient satisfaction. "If a hospital wants to remain viable and competitive, it needs to think of growth being powered by value enrichment and not to just be stuck in conventional cost accounting," according to Wolf.

"If a hospital wants to remain viable and competitive, it needs to think of growth being powered by value enrichment and not to just be stuck in conventional cost accounting," according to Wolf.

Transforming Inpatient Procedures to Outpatient Procedures

Kuhn has seen how use of the ON-Q as part of a very aggressive pain management and rehabilitation protocol at his facility has helped with the conversion of many inpatient procedures, such as gallbladder removal, hernia repair, hysterectomy, and gastric bypass, to outpatient procedures. The hospital is now able to bill some insurance companies for these procedures on a "cost plus" basis that often nets the facility more revenues than the same procedure performed inpatient. This example demonstrates how a single technology that is implemented effectively can completely change current clinical paradigms and open up new financial opportunities.

One anesthesiologist who uses the ON-Q at a major teaching hospital employs it as part of a larger initiative to reduce the use of routine general anesthesia in his orthopedic cases. This anesthesiologist points to the ON-Q's ability to transform an inpatient procedure with a long LOS into an outpatient procedure, with likely a higher chance for patient satisfaction because of the better pain control. "[ON-Q] can realistically transform a 48 to 72 hour hospital stay into a 24 hour hospital stay and there is certainly going to be cost reductions by reducing length of stay," according to the anesthesiologist. This same physician points out that use of ultrasound in placing peripheral nerve block catheters, like with ON-Q, is increasingly popular, and that that ultrasound procedure itself is often reimbursable.

CONCLUSION

Whether a hospital adopts new technologies or not is not an option. Hospitals must constantly evaluate new technologies to improve patient outcomes, as well as to maintain competitiveness and financial viability. Hospitals should institute multi-disciplinary technology evaluation committees aligned with the larger strategic objectives of the whole facility and system. These committees must have executive sponsorship and broad influence over the entire facility to address conflicting agendas and make decisions in the best interest of patients and the facility. Hospitals must ensure that the adoption of new technologies is aligned with the larger priorities of the facility and its mission.

Most hospitals have these committees to some degree already, but administrators need to take a more proactive role in bringing up for evaluation new technologies. Whether the technology passes clinical muster is crucial, but every new idea deserves evaluation, regardless of where that idea may have originated. A holistic approach to technology assessment is crucial for hospitals to fully appreciate the value of the technology. This approach includes a thorough review of the true economics of a technology and the long-term outcomes it can deliver. This process must be guided by more than simply a narrow focus on reimbursement or the partisan interests of particular departments. There are many technologies used now because of their clinical and operational benefits even though they are not reimbursable, including pulse oximetry and surgical staplers. Pursuing reimbursement and cutting supply costs are not the only ways or even the best ways for hospitals to improve their profitability and overall performance. If a cost incurred allows a facility to keep more reimbursement, achieve overall net cost savings for the facility or increase patient volumes, then it makes sense to adopt it regardless of whether it might be reimbursed itself.

Hospitals should institute multi-disciplinary technology evaluation committees aligned with the larger strategic objectives of the whole facility and system.

I-FLOW

I-Flow Corporation is improving surgical outcomes by designing, developing and marketing technically advanced, low-cost drug delivery systems and innovative surgical products for post-surgical pain relief and surgical site care. For more information on I-Flow Corporation visit http://www.IFLO.com

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