

## **LEVERAGING TECHNOLOGY TO MAXIMIZE EFFICIENCIES IN TODAY'S CHALLENGING RESPIRATORY CARE ENVIRONMENT**

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*Give me a lever long enough and a place to stand and I will move the entire earth. Archimedes (c. 287 – 212 B.C.)*

The challenges imposed by healthcare reform are having an effect on the respiratory care landscape similar to the effect the tsunami had on the landscape of Japan; long established standards of care and traditional care delivery services cannot survive in such a financially challenging environment and are rapidly being assessed and modified to accommodate our new understanding of quality and effectiveness. To ignore the massive changes facing us and maintain the status quo is to deny the unsustainability of healthcare expenditures and put our ability to provide excellent patient care at risk. Spending on healthcare is estimated at 17.3% of our Gross Domestic Product (GDP) and translates into over \$2.3 trillion in costs per year<sup>1</sup>, an expense that is clearly unsustainable.

There is no doubt that radical changes are necessary to ensure the ability of respiratory care to not only survive but thrive. The financial challenges imposed through the juggernaut of healthcare reform are making it imperative for RT departments to deliver care to our patient population as efficiently as possible. Efficiency implies safe and cost effective care that delivers the desired outcomes.

### **BACKGROUND**

In the Fee-For-Service era hospital-based respiratory departments were revenue centers for the hospital. Each unit of service, including oxygen therapy, was billed and reimbursed without necessarily considering the need for the therapy. If the physician ordered the treatment, the therapist delivered the requested service, the patient was billed, and the patient's insurance company paid the hospital. This model encouraged overuse of services; the more units of service delivered, the more the department's revenues increased and the happier hospital administration was.

Diagnostic Related Groups (DRGs) made their appearance in the early 1980s and placed limits on inpatient hospital revenues through standardized reimbursements based on the patient's admitting diagnosis. Hospitals made money if they were able to discharge the patient before the allotted reimbursement was completely consumed. Respiratory departments, along with all clinical departments, transitioned from revenue centers to cost centers since every unit of service provided was now an expense that ate into the standardized reimbursement the

hospital received from the patient's insurance. This was the era when protocols became popular as a way of ensuring effective allocation and appropriate utilization of respiratory therapy.

We are now feeling the effects of the latest efforts to reform healthcare and reduce costs. Revenues for acute care facilities will be limited even further as reimbursement for services provided will be based on not only a determination of the appropriateness of the care delivered but also on the positive outcomes achieved and how satisfied patients are with the care they receive. The Institute for Healthcare Improvement (IHI) promotes the idea of patient-centered care which takes into account a patient's preferences for care. The experts at the IHI feel that this collaboration between patient and healthcare provider ensures more coordinated, efficient care and "unneeded and unwanted services can be reduced." In other words, this is a new paradigm in which patients have more control over the type of care they will accept and the hope is their input will help drive a higher quality of health care, improve the patient experience and increase efficiency.

### **CONCERNS FOR RESPIRATORY MANAGEMENT**

Respiratory care managers are experiencing the reductions in reimbursements that government and private payers are implementing in an attempt to control rising costs. The challenge for management is to continue providing acceptable levels of care when the payment for that care has been reduced but, in many cases, the underlying cost to provide the service has not. "Lower prices without corresponding cost reductions will hurt hospital margins, which can slow future investment or jeopardize a hospital's financial future. Price cuts by payers might also, unfortunately, encourage dysfunctional cost cutting by healthcare organizations, in which layoffs and the closure of units and service lines might harm quality or reduce the level of care provided to a community."<sup>2</sup>

In response, hospitals across the country are reducing costs by embracing lean concepts. The goal of lean methodology is to provide safe, efficient, high quality care while eliminating waste. And while many fear that quality will be sacrificed in the effort to decrease operating costs, there is an evolving pool of evidence demonstrating that quality care actually costs less; that costs can be reduced when efforts are made to improve the quality of healthcare delivery methods and processes.<sup>3</sup>

Like other clinical departments, the delivery methods and processes used by respiratory care departments throughout the country are full of waste and inefficiency. This is not the fault of the respiratory therapist and managers who work in the profession, but rather a result of the way in which hospitals have traditionally developed and evolved. However, just because things have always been done a certain way is not an acceptable excuse to perpetuate inefficient and

wasteful processes. According to the Agency for Healthcare Research and Quality (AHRQ) it may take as long as two decades for research outcomes to be translated into improvements in daily clinical practice.<sup>4</sup> We do not have the luxury of time; immediate changes are necessary in order to counteract the revenue reductions we are already experiencing. Respiratory managers and therapists alike must look at current delivery methods with a sharp eye and ask the question “what if...”

### **“WHAT IF...”**

Let’s evaluate a very basic respiratory service: oxygen therapy. Despite a myriad of technical advances, Respiratory Therapy will always be identified with oxygen delivery. What if we could find a way to deliver oxygen more efficiently to our patients? What if we could identify a new delivery process that reduces waste and is more cost effective? What if we found a way to provide this service in a way that made patients more comfortable, confident and satisfied with the care we provide?

The two largest expenses incurred by respiratory departments are therapist salaries and patient care supplies. Respiratory department managers are being challenged to implement more efficient, cost effective processes that produce desired outcomes while promoting flexibility of care. Therapies that are ineffective, inefficient and/or labor intensive are becoming cost prohibitive and must be evaluated for change or elimination.

One Respiratory department was challenged with just such an opportunity when respiratory management was contacted and asked if there was a better way to deliver higher  $F_{iO_2}$  to laboring mothers. During the laboring process the mothers were routinely provided with supplemental oxygen using a traditional non-rebreather (NRB) mask; it was the mask that had always been used when higher  $F_{iO_2}$  was desired. However, the mask design was not perfect because the position of the mother during labor caused the reservoir bag on the NRB mask to crimp off, thus rendering the delivery device ineffective. “Isn’t there a better way?” This one simple question presented the respiratory department with an ideal opportunity to evaluate the existing delivery process and identify possible quality improvements.

### **A NEW PROCESS – MAXIMIZING LEVERAGE**

Think of a teeter-totter. When you were a child you learned that a heavier weight on one end of the teeter-totter, the lever, could easily lift a lesser weight on the other end. The same outcome can be experienced when attempting to implement a change: the more support for the change the easier the change will be to implement.

Leverage can be defined as the influence or power one uses to achieve a desired result. It can also describe the power to act effectively. The Respiratory Therapists were in an ideal position

to use their leverage, their knowledge of available technology and their position as subject matter experts, along with support from the Labor and Delivery staff, to evaluate how a change to a different technology could improve the quality of the care delivery process. Respiratory Therapy took advantage of this opportunity to use their leverage in this situation to evaluate how oxygen therapy was delivered throughout the entire hospital and redesign aspects of that process to be more efficient.

Healthcare organizations around the world are undergoing rapid change, adopting technologies and processes to improve efficiencies, reduce costs and deliver patient-centric care. The first step in any change process is to involve all key players and assure a comprehensive approach that solicits all viewpoints, identifies and anticipates problems with any new process, and effectively communicates the advantages of the changes to the rest of the healthcare team. Additionally, as explained in the AARC Leadership Institute's module on Healthcare Infrastructure and Economics, "for each new technology we are considering, we must document the impact on patient care. Impact can include decreasing length of stay, decreasing time on the ventilator, reducing readmissions, decreasing the cost of services and others."<sup>5</sup>

Champions from Respiratory Care, Nursing, Education, Materials, and Physician staff were identified and asked to participate in the development and evaluation process when it was determined that different technology and/or a new process was necessary. One of the new products considered was the OxyMask by Southmedic. Several therapists in the department had recently seen this new product while attending an educational conference and proposed it as a possible solution to the situation. They described the device to the group and members were intrigued because of the open design and ability to deliver a wide range of  $F_{I}O_2$ . Discussion centered on potential benefits, advantages/disadvantages, as well as possible alternative solutions. Because this mask was more expensive than what was currently being used there was also a discussion about the impact of not changing to this new technology but it was determined that the potential efficiencies gained would outweigh the increased costs. A decision was made to proceed with a trial and samples of the OxyMask were obtained. A limited trial proved successful. The laboring mothers were satisfied with the project because its open design was cool and comfortable and did not make them feel claustrophobic. Nurses and physicians were happy with the product because it made communication between the patient and the caregivers easier. Therapists approved the product because it was easy to use, easy to fit to the patient, and because it delivered a wide range of  $F_{I}O_2$  thus eliminating the need to continually switch to alternate oxygen delivery devices to maintain patients' saturation levels in rapidly changing clinical situations.

As a result of the successful trial the decision was made to implement a change to the OxyMask. Those who had been involved as members of the steering group were critical to

ensuring a successful transition to the new technology. The Materials staff obtained advantageous pricing and facilitated placement of the technology in the hospital storeroom while the Education staff assisted with orientation to the use of the new product. Nursing and Respiratory staff worked collaboratively with physicians to integrate the new technology into routine care processes.

## **OPERATIONAL BENEFITS**

In common with many other respiratory departments we are continually challenged with cost containment efforts while continuing to deliver high quality patient care. Once the OxyMask had been successfully implemented into the Labor and Delivery unit we investigated further opportunities to introduce this new technology with the goal of reducing costs and streamlining processes.

Respiratory therapy is a “technology intensive” field with a large variety of many different types of supplies maintained in inventory. When one is evaluating opportunities for cost reduction the expense of inventory is often overlooked. Carrying a large inventory of equipment and other supplies is often necessary, but there are ways to reduce the cost while continuing to provide acceptable levels of service. Inventory expense is the cost to the organization for holding equipment and supplies in stock, ready to be used. Inventory expense includes 1) the actual cost to purchase each supply/equipment item, 2) storage costs including the shelving or bins to contain the supplies as well as the floor space in the storage area, 3) the cost of waste including replacement of outdated and obsolete items, 4) inventory management including the movement of supplies within the organization, and 5) opportunity costs – the money tied up in maintaining your inventory is money that cannot be spent on other things including new equipment or staff salaries.

The OxyMask can be used in place of several alternative oxygen delivery devices because of its wide  $F_{I}O_2$  delivery range. Obviously no one device will work for all circumstances, so complete elimination of all alternative oxygen delivery devices was deemed to be impossible, but despite the higher cost of the OxyMask, respiratory management felt it would be possible to reduce overall costs if the inventory of alternative oxygen delivery devices could be reduced. The oxygen delivery devices that were targeted for elimination or reduction included low flow nasal cannulas, simple masks, venturi masks, and non-rebreather masks. These devices were stocked in multiple storage areas throughout the hospital including the main RT department supply room, individual patient care units and the main hospital storeroom. Reduction of the type and number of devices in inventory would reduce the associated purchasing, handling and storage costs associated with a wider variation in oxygen delivery devices.

As in many hospitals, storage space is always in short supply. Our original goal was to reduce our storage space needs by 50%. In consultation with the hospital's Finance Department we determined that the cost per square foot of occupied space within the hospital was \$150. In our main RT storage area alone we had had one large metal storage rack containing most of our oxygen delivery devices. This metal storage rack occupied 24 square feet of space, which meant that the space it occupied was valued at \$3,600. The RT department also stocked oxygen delivery devices in nine satellite storage areas located in patient care units. The cost of this space was estimated at an additional \$8,100. By reducing our device inventory we reduced the amount of storage area needed for our devices, including the bins, racks and shelves that were used to contain the equipment. We decreased the cost of the space we occupied to an estimated \$7,800 (a 33% reduction) and made additional storage space available for other critical patient care items.

Another expense we considered was the lean concept of waste; in this case lost productivity and efficiency as therapists too often spent time and energy running between storage areas searching for alternative oxygen delivery devices as their patient's clinical situation changed. We conservatively estimated that we saved each therapist approximately 20 minutes each week in wasted time looking for oxygen delivery equipment. In our small department this amounted to an estimated cost savings of \$8,600 salary dollars per year, or 0.2 FTEs.

Additional tangible benefits included an increase in staff satisfaction (both respiratory and nursing) and the fact that the therapist is able to spend more time at the bedside of a critical patient instead of wasting time and unnecessary steps retrieving alternate delivery devices.

One final cost to hospital operations that many respiratory therapists do not consider is the expense of waste disposal. When more oxygen delivery devices are thrown away, the organization experiences increased medical waste disposal costs. Medical waste is either incinerated or taken to a landfill for disposal, and in addition to the expense there is an associated environmental impact with each disposal method. By using one device for multiple clinical situations the overall volume of medical waste generated is decreased. This results in decreased cost of disposal for the organization and a smaller negative impact to the environment.

## **SUMMARY**

In our Respiratory Care department the transition to the OxyMask enabled us to provide more efficient, streamlined service to our patients, resulting in improved patient and staff satisfaction, reductions in space used for supplies storage, and operating cost reductions related to a decrease in the number of different types of devices needed to provide quality care.

## REFERENCES

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