Wasting away

The quality, safety, and financial case for clinical asset optimization

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Mobile clinical assets are indispensable in healthcare delivery. Whether it’s an IV pump, a bedside telemetry unit, or a wheelchair transport at discharge, virtually every patient depends on one or more mobile assets during a hospital stay.

Unfortunately, hospitals often lack effective management and distribution processes for mobile equipment. A common but costly solution is to overstock these items, hoping there will always be one at hand when needed.

That’s the theory. But reality is usually very different. Nurses often spend 10, 20 or 30 minutes per shift hunting for clean, working IV pumps. Telemetry units get swept up in bedding and lost in laundry chutes. Wheelchairs go missing. The impact on patient care, staff productivity, and costs is staggering—especially at a time when healthcare organizations are challenged to do more with less.

Waste in healthcare—defined by The New England Healthcare Institute as “healthcare spending that can be eliminated without reducing the quality of care”—totals around $700 billion annually in the United States, according to a 2009 Thomson Reuters report.¹ Nationally, hospitals are overspending billions each year — usually unknowingly — on mobile assets that are not utilized effectively. Despite more than adequate inventories, equipment often is not available when needed. As a result, more units are bought, leased, or rented. And those, in turn, get lost in the system and underutilized.

Breaking that cycle offers a significant opportunity for healthcare organizations to make serious gains in achieving their patient care and cost management goals. For example, in our experience, the utilization rate for IV pumps in most hospitals today is only about 40 percent. * With the right processes and technologies in place, however, 80 percent utilization is a realistic, achievable target.

By understanding how mobile clinical assets are managed and used in the organization, and then developing effective policies and processes to optimize their utilization, healthcare organizations can:

- **Improve care efficiency, patient safety, and staff productivity** by ensuring the right equipment, clean and in working order, is available at the right time in the right place
- **Achieve inventory reductions of up to 25 percent**, with a corresponding decrease in capital and operating expenditures

### Asset Utilization: the missing consideration

Because mobile assets are considered a fixed-cost item, healthcare organizations tend to focus on two controllable factors in managing their costs: the direct costs related to equipment acquisition and the maintenance expense. But a third variable—asset utilization—is equally critical. Determining how effectively the assets are actually being used is seldom evaluated as rigorously, if at all.

Consider the typical acquisition process for new mobile equipment. The CFO/COO will base the volume of purchased units on a multiple of the census or will simply ask nursing what’s needed. Nurses—tired of searching for equipment—will report that they don’t have enough and ask for a 20% increase over the current count. Without data on actual utilization, management has a critical knowledge gap. When managers do examine utilization patterns, it can become painfully clear that asset distribution is ineffective to the point that timeliness of care is jeopardized, staff productivity is hurt, and capital and operating budgets are negatively impacted.

Looking at the costs associated with IV pump mismanagement provides a snapshot of the savings possible by optimizing asset utilization. If a 200-bed hospital can reduce its inventory of 400+ infusion pumps by 100 through more effective management and distribution—a realistic goal in our experience—it can achieve $300,000 to $500,000 in savings by immediately reducing rentals, terminating leases, and avoiding unnecessary capital expenditure during the next pump purchase. In addition, decreasing a pump fleet by 25% can yield immediate savings on maintenance costs.

Personnel costs are another area of impact. When one hospital evaluated its mobile asset availability, it discovered that nurses were spending approximately 21 minutes per shift searching for equipment—equating to nearly $500,000 per year in non-productive time due to ineffective asset utilization.
Achieving 100% utilization of IV pumps is impossible due to several factors, including pharmaceutical cycles, maintenance requirements, and labor/workflow considerations. However, we have seen hospitals boost their rates to the 80% range by rethinking pump distribution, management, and tracking. Even a more modest improvement—say from 40% to 60% utilization—can yield significant gains in staff productivity and satisfaction, care efficiency, and cost control.

Broken processes

When a healthcare organization discovers a problem with clinical asset utilization, there is often a desire to quickly solve the problem in one of two ways: cut inventory drastically and instruct employees to make do; or buy more units, hoping the problem will resolve itself. Either approach is disastrous; the issue is that the underlying distribution processes are broken. Cutting inventory will only exacerbate employee behaviors, like equipment hoarding, that reduce asset availability. Adding more units will drive up costs further without motivating the behavioral changes necessary to break the cycle.

Circulation

• Hiding and hoarding—Because nurses can’t get equipment when they need to, they often stash hard-to-find assets in closets or holding areas so they are available when needed. This is rational, even laudable, behavior since you want caregivers to care first and foremost about their patients. Unfortunately, this only creates more shortages, which, in turn, leads to more hoarding. The authors of the 2008 study Describing The Influence of Technologies on Registered Nurses’ Work reported that the nurses they surveyed acknowledged hiding equipment that might otherwise not be available to them and observed that: “Nurses are skilled at establishing workarounds … Findings indicate that nurses respond to technology system problems by solving the immediate problem using whatever strategy works … These strategies include hiding infusion devices … Nurses meet the immediate patient care needs but do not solve larger, system problems.”

• Ineffective cycling—Many organizations lack effective protocols to get used assets cleaned and back into circulation for newly admitted patients. Likewise, returning mobile equipment to the biomed department for formulary updates, software, and hardware upgrades, and maintenance is often stymied due to lack of process. This points up a key driver of inefficient workflow: poor communication. Without established signaling methods, nurses don’t know which assets are cleaned and available, the distribution center isn’t alerted when par levels are low, and biomed is unaware of assets needing repair.

Responsibility

One of the biggest challenges in managing mobile assets is their ubiquity. Their availability is everybody’s problem but often no one’s responsibility. It’s critical to determine who will own and manage each piece of the distribution process. When accountability is not clearly defined, it is virtually impossible for management to demand improvement and follow through with it. A structured process with a clear chain of responsibility will drive better, more consistent results.

Information

Most healthcare organizations have comprehensive usage logs on high-end medical equipment, such as radiology devices, or specialty equipment in the OR or cath lab. But they often lack the same data on smaller, more general equipment like wound vacuums and telemetry units. Without up-to-date information on inventory, location, and usage patterns, managers cannot make effective decisions about unit distribution, acquisitions and rentals, and other critical issues. As a result, management tends to be reactive rather than predictive. Instead of planning rationally for demand, they focus on putting out fires, an approach that generally leads to higher costs and sub-optimal results in the long term.

Moving toward asset optimization

In our experience, most hospitals have far more mobile assets than they actually need for patient care. Helping hospitals achieve a more cost-effective asset-to-patient ratio is a multi-step process that, performed optimally, includes the following steps:
ASSESSMENT: Evaluate current inventory, including par levels, storage locations, and utilization metrics. Understand patient care patterns and staff workflow.

WORKFLOW REDESIGN: Reconfigure workflow processes to ensure efficient asset management and distribution processes.

CHANGE MANAGEMENT: Help employees understand, accept, and follow the new processes.

REAL-TIME LOCATION TECHNOLOGY: Integrate real-time location technologies that monitor asset distribution and usage, providing actionable information to help control costs and improve the quality and efficiency of care.

While the next sections focus on how the four steps in the Asset Optimization framework are applied to the challenge of improving infusion pump utilization, the principles and the process described apply to other mobile assets as well.

1. Assessment

Examine the numbers. Gathering data on the current pump workflow is necessary to establish the program’s baseline and determine appropriate targets. These early observations can reveal when a pump optimization project may be inappropriate, as in a smaller hospital where pump demand is low or when trade-offs between inventory reduction and labor costs are inadvisable. Among the critical metrics, we examine:

- Number of pumps—owned, leased, and rented
- Pump-to-census ratio—matching assets to demand
- Pump utilization—how often the pumps are on
- Equipment turns—inventory turnover percentages and cycle time between process checkpoints
- Par levels—the number of pumps stored in care areas and are ready to be used
- Pumps in biomed—total time to repair
- Pump delivery time
- Financial data—including lease and rental rates, biomedical costs, and rate of inventory refresh

Talk and walk with staff. We talk with staff members in all areas: nurses and nursing managers in all units and departments; staff in Central Sterile and in housekeeping; and biomedical technicians who service the equipment. Shadowing staff is another part of the methodology (for example, following employees to see how they reclaim, clean, and distribute pumps, and what they do with broken pumps).

We often find that the front-line workers have the most to say and the most to offer when it comes to identifying opportunities and offering advice. Managers, on the other hand, are closer to barriers that will have to be addressed to be successful.

The results can be eye-opening for executives. When a CFO learns, for example, that 30 pumps are sitting in biomed waiting for repair, the connection between ineffective processes and higher costs (the 30 pumps recently rented to meet demand) becomes clear.

2. Workflow Redesign

Each hospital has its own “pump ecosystem.” After gaining a firsthand view of the current state of operations, we typically lead hospital managers and front-line staff in Lean-based value stream mapping sessions in which every step of the pump circulation process is identified and discussed.

The team then develops a new process that reduces steps, eliminates wasted motion, and solves other problems that prevent efficient pump distribution. It’s critical to determine who owns and manages the distribution process. This may be a centralized approach with Central Sterile serving as the hub and delivering pumps as needed to the care units or a decentralized system in which par levels are maintain on the individual floors or care areas. Either approach can work, depending on the organization’s culture and workflow preferences.

A phased implementation is often advisable to control the changes and allow for process adjustments. After the initial phase, the pumps considered “excess inventory” in the redesigned distribution system are locked away, available only to the staff in an emergency—similar to an in-house rental. The staff is encouraged to follow the new process and see if it improves pump availability to the point where inventory levels can be permanently reduced.

3. Change Management

Moving from a dysfunctional asset workflow to one in which units are in the right place in the right condition at the right time means that staff members will need to do their jobs differently. Even if the new process requires only minimal adjustments and delivers positive outcomes (less frustration, greater productivity), there is still likely to be resistance to change. Nurses, for example, may need assurance that the new system will work before they give up the workarounds that have been necessary to care for patients in the past. Central Sterile may have to change rounding patterns and designate “runners” and “washers.” Environmental Services might have to start including mobile equipment in its cleaning routine. Nursing may need to move equipment at different times.

To help ensure employees understand, accept, and will use the new system, we deploy a set of change management
tools called the Change Acceleration Process model, or CAP. Developed in the early 1990s under former CEO Jack Welch, CAP is still being used to manage rapid adjustments in GE organizations. Combining communications tools, proven methods of engaging employees and mobilizing support, and a measurement-reward system, CAP provides the accountability and structure necessary for continuous and lasting change.

4. Real-time Location Technology

Once an optimal pump circulation process is successfully designed, piloted, and implemented housewide, many hospitals choose to take the next step in asset optimization—adding a real-time asset location system to monitor pump usage, status, and location.

In a system like GE Healthcare’s AgileTrac™, each pump is fitted with a Real-time Location System (RTLS) tag that communicates with a central visualization system, enabling the staff to see data on pump location and status in real time by using a Web browser. Many managers we’ve worked with say it’s like turning on a light switch: One day they have no idea where their pumps are, and the next day, they know exactly where each one is.

This information helps managers make better decisions about workflow issues, including par level optimization, utilization, and rental management. Loss prevention alerts help reduce shrinkage. Real-time monitoring and system alerts, in combination with utilization reports, assist in enforcing the new processes and sustaining positive change.

Optimizing every day

The U.S. healthcare system is literally “wasting away.” To ensure their own long-term viability, individual healthcare organizations need to address this problem by identifying and correcting operational factors that contribute cost, not value, to care delivery. But given the multiple cost drivers in a hospital, where should they start? Which areas hold the most potential? By focusing on improving the utilization of mobile clinical assets, many hospitals—large and small—are finding they can make significant gains in controlling capital and operating expenditures. By redesigning their distribution and management processes and, in some cases, adding real-time location technologies, they are able to reduce inventory, lower or eliminate rental and lease expenditures, and decrease maintenance and service costs—all of which can amount to hundreds of thousands of dollars in savings each year. On the care delivery side of the equation, ensuring that everyday mobile clinical assets are always in the right place at the right time and in good working order contributes to safer, more efficient care and improved patient and staff satisfaction.

Asset optimization results

GE Healthcare consultants have worked with a wide spectrum of healthcare institutions, and while all organizations are different, virtually every one, in our experience, can benefit from evaluating and rethinking their asset distribution process. Here are just a few of the gains our clients have made through clinical asset optimization.

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<th>Hospital</th>
<th>Results</th>
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| 370-bed non-profit teaching hospital | • Saved $76,000 in annual operating expenses by eliminating rented and leased units  
• Avoided $500,000 in capital expenditures during its last equipment refresh |
| 290-bed for-profit acute care facility | • Saved $151,000 in annual operating expenditures by reducing inventory and eliminating pump rentals |
| 400-bed two-hospital health system | • Saved $400,000 in annual operating expenditures by reducing inventory and eliminating pump rentals |
| Four-hospital health system | • Saved $2 million in annual operating expenses due to reductions in equipment rentals and lost/stolen equipment  
• Reduced average search time for missing equipment from 40 minutes to nearly zero |
| 570-bed regional hospital and teaching facility | • Avoided $110,000 in capital expenditures by canceling a planned pump purchase  
• Made productivity gains equivalent to $5.2 million by reducing the time that staff spent searching for pumps |
| 700-bed for-profit acute care facility | • Realized $1.9 million in capital savings by reducing inventory and transferring equipment to other facilities  
• Saved $104,000 in annual operating expenditures due to reduced maintenance requirements  
• Reduced equipment search time, saving 12,000 hours per year that can be redirected to patient care |
| Two-hospital health system | • Realized $700,000 in annual savings from equipment and rental reductions |
Authors

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*Utilization is defined in this context as the percentage of time that an infusion pump is actively pumping.

References