Clinical Equipment Service Cost Accounting: Why It’s Flawed—and How to Fix It

By now, most hospitals have tackled the low-hanging fruit of cost savings, but there are still considerable opportunities to shape up financials by taking stock of the dollars spent on servicing clinical equipment.

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High-quality patient care requires equipment that functions to the manufacturer’s specifications, so equipment servicing and maintenance are a necessary cost of doing business in health care. That doesn’t mean, however, that healthcare organizations can’t improve how they manage these often hidden costs.

Hospitals annually spend between $5,000 and $7,000 per bed to service capital assets used in patient care, such as biomedical, laboratory, monitoring, life support, and diagnostic imaging equipment. Because service costs consume a substantial share of a hospital’s annual budget, a detailed audit is likely to uncover opportunities for cost savings and improved efficiency.

With tighter capital budgets, many hospitals have chosen to shoulder higher service costs by opting for expensive maintenance and repairs aimed at stretching the lifespan of their equipment. Some hospitals have dropped pre-paid service contracts on select clinical equipment in favor of time-and-materials service arrangements. Although this may ease budgetary pressures in the short run, these hospitals risk not having equipment available when needed and potentially paying more out-of-pocket for repairs.

A full understanding of clinical equipment service costs provides the groundwork to reduce these costs and optimize associated vendor and outsourcing arrangements, while minimizing risks. Unfortunately, most hospital cost accounting systems and practices simply are not up to the task of accurately measuring service costs, which are often misclassified, misplaced, or simply not recorded in an easily identifiable way in the traditional systems used by many healthcare institutions, from single hospitals to multi-facility health systems.

What’s needed is a repeatable, robust process that provides management with the insights necessary to get maximum value from each service dollar spent while maintaining clinical equipment at an optimal performance level.

**A Fundamentally Flawed System**

The root cause of poor equipment service cost accounting is that the equipment service function is fragmented and decentralized. Ownership of clinical equipment assets tends to reside with individual departments within the hospital, such as radiology, laboratory, or clinical specialty areas.

Service costs are often handled very differently across departments. For instance, some departments do not differentiate between clinical and nonclinical service costs, paying both from the same subaccounts—usually “repairs and maintenance” or “maintenance contract expense.” As a result, service and repair for clinical assets are often intermixed with service costs for fax machines and copiers.

Different departments may use different accounting codes for the same type of expense, which means that multiple budgets and line items must be examined. Some coding differences can be traced to differences in the way that expenses are coded by individual accounts payable clerks. Others reflect decisions to shift expenses to subaccounts when the budget for the original line item has been exhausted.

Outsourcing presents its own complications. Few hospitals have succeeded in standardizing and centralizing contracting for outside service providers. Contract payment and coverage terms vary tremendously, and individual managers often code costs to different and, sometimes, obscure line items in their departmental budgets. The only way to quantify vendor costs is to review the specific terms of each service contract, which can be a formidable task. A 300-bed hospital may easily have 4,000 devices covered by 100 different service contracts with 50 or more different vendors. Collecting and correctly interpreting all the clinical asset-related service contracts for every department requires substantial time and effort, particularly the first time through.

**Blueprint for Quantifying Service Costs**

How can a management team arrive at an accurate measure of service costs given the complex ways that hospitals provide and account for clinical equipment service? The answer is to apply a repeatable, systematic, and knowledge-based process for accurately quantifying service costs.

**Step 1: Form a core project team and define the project’s scope.** The project team should consist of individuals who are

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familiar with and have access to the relevant accounting systems and service contracts. It is also essential to include at least one individual from the biomedical/clinical engineering department or someone with equivalent hands-on knowledge. The project team should select an executive sponsor, usually the hospital’s CFO or CEO. Once established, the team’s first task is to define the project scope, setting explicit goals, time-lines, roles, and expected hours or level of effort required from each team member.

**Step 2: Collect data.** The key data sources are the general ledger and accounts payable ledger with department-specific information and transaction-level detail, a list of all accounting codes in current use, an inventory of all the hospital’s clinical assets, and copies of all vendor contracts that cover outsourcing of clinical asset maintenance or service.

**Step 3: Employ forensic accounting.** This step relies on sophisticated, knowledge-based “pattern recognition” skills to determine where clinical asset service costs are likely to be hidden. It can take weeks to sift through detailed transactions to ensure that all relevant costs are captured.

The first step is to determine the actual service costs for clinical equipment. Include purchased time and materials as well as service contract costs. It’s also important to include any in-house labor and departmental costs for the biomedical engineering department.

Exclude costs for non-clinical equipment (e.g., refrigeration units, laundry equipment) as well as the cost of accessories, consumables, or disposables related to the use of clinical and non-clinical assets (e.g., cables, power cords, filters, batteries). In addition, exclude consulting fees; renovation costs; and upgrades for equipment, hardware, and software.

The team should examine clinical asset inventories, rather than the hospital’s capital asset list. For example, if a hospital lists several dialysis machines on the inventory, the team will need to track down the associated service costs. This task is complicated by the fact that the service costs may be bundled in with other departmental costs or, alternatively, only show up as a component of an outsourcing contract. The latter case underscores the importance of reviewing all outsourcing agreements (in addition to reviewing the general ledger) to identify otherwise “hidden” service costs for clinical assets.

The assessment is also an opportunity to evaluate whether inventory matches up with the service contracts, to eliminate unnecessary contracts (e.g., for equipment that is no longer in use), or to streamline contracts with overlapping or redundant services (e.g., paying for repairs on a time-and-materials basis when a pre-paid service contract is in place). The contract review process also enables the team to gauge whether the proper level of service is in place (e.g., 24/7 versus 9 to 5) given the mix of clinical equipment and the intensity of use for each type of device.

A major metropolitan hospital system in the northeast was able to identify a potential 40 percent reduction in contract spend by consolidating and eliminating redundancy in contract spend and properly utilizing in-house skill sets.

**Step 4: Identify savings opportunities.** The now-accurate service cost data can be used to identify cost-saving opportunities. No single metric can fully assess the efficiency of a hospital’s clinical equipment service and maintenance strategy. Instead, a holistic approach in which related metrics are considered as a group to pinpoint opportunities to improve efficiency and cost savings is more appropriate. Metrics to consider include:

- Cost per staffed bed
- Cost per clinical device
- Cost per biomedical engineering technologist (BMET)
- Clinical devices per staffed bed
- Clinical devices per BMET (see the sidebar on page 4 for average measures)

A few examples help illustrate the basic concepts behind this approach.

> Hospital A has compiled service costs for its clinical assets and discovered that its service cost spend per bed seems high. In isolation, this measure provides insufficient information for the team to fully understand the issue and take appropriate action. In examining the average service cost per device, the hospital determines that the high per-bed spend is actually driven by a higher-than-expected average number of devices per bed. The next question for the team to consider is whether the device count is “right” for the hospital’s number of beds and patient census, its function (e.g., teaching versus community hospital), typical patient mix, and whether there may be opportunities for cost-savings by paring down the device inventory.

> In Hospital B, a 200-bed facility, the number of devices per bed seems to be
in line with expectations, but the hospital’s census is typically around 100 patients. It is only by looking at these two metrics together that the team sees an opportunity to reduce operating (and service) costs by optimizing the number of devices in inventory because the census suggests that a smaller inventory may be adequate.

The Bottom Line on Service Cost Assessments
Hospitals that have performed service cost assessments typically report that the process validated indications of room to improve their approach to servicing clinical assets. Typically, hospitals can achieve savings of 10 to 15 percent in the first year after conducting an assessment and implementing process changes (see the exhibit at right).

The best results are achieved by organizations that conduct regular cost reviews, and adjust their approach accordingly. Implementing a systematic and sustainable approach to effectively measure and manage clinical equipment service costs can help hospitals quickly reduce waste while preserving and improving both near-term and future bottom-line results.

Determining Average Expenses for Key Metrics
Industry trade magazines will provide some points of measure regarding benchmark data related to key metrics that typical programs can follow. It’s important for a hospital to select metrics to measure routinely, look for the trends within the data, and take action to remediate any negative movement in the trends.

Below are some of the average expenses GE Healthcare has observed from its 50 most recent assessments (of more than 500 assessments that have been conducted at hospitals across the country). Please note that these numbers should not be interpreted in isolation, nor should they be considered best-in-class “benchmarks” in the traditional sense. In many cases, optimal measures are well outside the range in which most hospitals currently operate. Also, note that these figures do not account for costs incurred on imaging devices, including but not limited to X-ray, CT, magnetic resonance, ultrasound, and radiation therapy.

Average Maintenance Costs by Category for a 300-Bed Hospital
It’s easy to lose sight of clinical equipment inventory costs, but the cost of smaller devices quickly adds up, accounting for half of a 300-bed hospital’s maintenance costs.

<table>
<thead>
<tr>
<th>Hospital Type</th>
<th>Outcome</th>
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<tbody>
<tr>
<td>100-bed facility</td>
<td>Service cost reduction of $55,000/year (25 percent)</td>
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<tr>
<td>150-bed facility</td>
<td>Service cost reduction of $79,000/year (18 percent)</td>
</tr>
<tr>
<td>450-bed facility</td>
<td>Service cost reduction of $540,000/year (20 percent)</td>
</tr>
<tr>
<td>500-bed facility</td>
<td>Service cost reduction of $476,000/year (20 percent)</td>
</tr>
<tr>
<td>Four-hospital health network</td>
<td>Discovery of inventory discrepancy on more than 2,000 devices (25% of total inventory) led to savings of more than $800,000/year in service costs.</td>
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<table>
<thead>
<tr>
<th>Key Metric</th>
<th>Average</th>
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<tbody>
<tr>
<td>Service Cost / Staffed Bed</td>
<td>$2,700</td>
</tr>
<tr>
<td>Service Cost / Inventory Item</td>
<td>$195</td>
</tr>
<tr>
<td>Staffed Bed / BMET</td>
<td>76</td>
</tr>
<tr>
<td>Inventory / Staffed Bed</td>
<td>15</td>
</tr>
<tr>
<td>Inventory / BMET</td>
<td>1,074</td>
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