Total Cost of Ownership: The Influence of Clinical Engineering

Identifying Hidden Expenses and Opportunities for Sustainable Savings

Today, many hospitals around the U.S. are cutting jobs and eliminating patient services citing Medicare cuts, a volatile healthcare landscape, and the Affordable Care Act as reasons. Despite the tremendous focus to reduce costs in the healthcare environment, many hospitals are not giving consideration to their clinical engineering (CE) spend and its impact on the total cost of ownership for capital equipment. Likely because they do not have a good understanding of their total clinical engineering spend.

Without this knowledge hospitals take the risk of incurring ongoing escalating expenses in hidden areas and missing out on significant and sustainable savings opportunities.

**Total Cost of Ownership (TCO)** is a calculation method used to ensure that all associated costs are considered over the life of each asset. These costs may include purchase price, installation, financing (including leasing or renting), utilities, upgrades, clinical engineering costs, training and disposal.

**In this article we’ll focus in on the clinical engineering spend and explore how those costs contribute to TCO and how you can use this information to save thousands – even millions – of dollars in clinical engineering.**
Understanding Clinical Engineering Spend

In order to effectively understand clinical engineering’s influence on TCO, there must be a clear understanding of what clinical engineering is – what is its function, responsibility and types of spend management. A well-functioning clinical engineering department is more than just purchasing and managing medical equipment – it should be viewed as comprehensive medical equipment management. Clinical engineering should be driving TCO analysis and delivering high utilization of equipment and financial goals. They should be data driven, and be able to provide valuable information regarding inventory, downtime, productivity needs and regulatory issues – all which help the management team make informed decisions and accurately forecast equipment needs. A best-in-class team is strategic, and can illustrate the “bigger picture” when it comes to equipment within your hospital today, and what’s coming in the future.

Having a clear picture of your facility’s clinical engineering operations, expenses, and effectiveness is as important as understanding its function. An effective clinical engineering department should be one area in which your hospital is consistently saving money, not spending it. The challenge is that many clinical engineering departments are chock-full of hidden costs making it difficult to uncover ways to save. There are the obvious costs like repairs and preventative maintenance (PM). But what you may not realize is many clinical engineering costs may be hidden within other departments throughout the hospital making it nearly impossible to track expenses and even more difficult to find ways to save unless you audit each department’s expenses line by line.

Further complication comes when the clinical engineering budget is not clearly visible to hospital management because it is lumped together with other departments within the hospital such as IT, Facilities, etc. Uncovering the true clinical engineering spend will help you make educated decisions and drive short-term and long-term savings.

Hidden Costs

Hospitals can assume undue financial risk when medical equipment service costs are not centralized in clinical engineering and are instead fragmented across hospital departments. This fragmentation creates large opportunities for costs to stay hidden. Consolidating these hidden costs within clinical engineering can provide significant cost savings to a hospital if you can find them.

1 Service Contracts

When clinical engineering does not manage all equipment service costs it results in the hospital having no systematic cost controls for these expenses. This typically is most evident in service contracts put in place with the original equipment manufacturer (OEM) at the time of equipment purchase. These contracts come at a high cost to the hospital because they commonly don’t take into consideration the internal talent and resources you’re already paying for within your clinical engineering staff. Service contracts tend to create an environment of unwarranted dependency where hospital staff immediately calls the OEM for repair and preventative maintenance rather than relying on the in-house clinical engineering team.

The problem with this behavior is unmonitored costs begin to mount when services outside of the contract are rendered.
We call these “bill-aboves” which include labor or parts excluded from the contract (the fine print). For instance, what if a CT tube fails at 5:15 p.m. on Monday? You are now outside of business hours and if glassware coverage is not included in your contract it’s going to cost even more than the initial investment you made in the contract. Involvement from your clinical engineering team can help to manage and mitigate these expenses by aligning the OEM service offerings with the skillsets of your in-house clinical engineering team and the support needs of the equipment in question.

In addition to bill-aboves, many service contracts have an auto renewal clause. If you don’t notify the OEM within a few months prior to the end of the agreement, you will automatically be engaged for another costly long-term contract while likely experiencing a cost increase over the previous term.

The Medical Consumer Price Index industry standard for inflation is about 3% annually; however some contracts can be up to 6%. These costs creep up every year, likely without notice. If you consider a 5-year agreement for $100,000 per year: a 5% increase each year adds $52,563 in additional costs over the life of the agreement for nothing more than staying in the contract.

Now each department is independently renewing with OEMs without considering the cost of the contract, the bill-aboves, coverage levels, exclusions, auto-renewals, or the skillset of the in-house clinical engineering team.

### 2 Miscoded Expenses in General Ledger

Although many financial professionals live by the general ledger (GL) for budgeting and forecasting, when it comes to clinical engineering there is often times a false reliance on this tool when accounting for expenses. This is a result of incorrect coding of expenses. For instance, the expense may be listed under a completely different department like radiology or surgery and misclassified as “Other Med Care Materials” and “Other Expenses” when it’s actually a clinical engineering expense. In an audit of 14 hospitals in the U.S., it was determined that a significant percentage of medical equipment service expenses are miscoded and land within the following departments with no reference to repair in the description:

- **Surgery/Operating Room** 21% of expenses
- **Services (Dialysis, Gastrointestinal, Cardiac Catheterization)** 14% of expenses
- **Radiology** 12% of expenses

When it comes to service contracts, the GL will likely provide visibility into only 50% of the total expenses for service contracts. This is because costs could be miscoded or coded as pre-paid or there could’ve been missed payments in the year being reviewed making it difficult to see the total value/expenses which in turn offers a false reading of the data or worse, false information altogether.

What’s worse is that fragmentation in the management of these expenses commonly results in having no plan to right-size service contracts or bring the services in-house in the near future.
The quickest way to improve TCO is to reduce or eliminate the amount and length of costly service contracts by investing in technology, training and teamwork.

3 Underdeveloped Clinical Engineering

Centralization of medical equipment service costs in clinical engineering is a critical step in reducing TCO for your capital assets; but this act alone is not enough. To fully realize the opportunity that centralization can provide you must have a well-run and appropriately staffed clinical engineering program that is properly equipped with technology and training. Often times, this is not the case and an underdeveloped clinical engineering program can itself become a source of missed savings opportunities. One common symptom of an underdeveloped clinical engineering program is the ineffective use, or complete lack of, a computerized maintenance management system (CMMS) to track, manage, and report on capital assets. The lack of an effective CMMS can quickly put your facility at risk of having too much or too little inventory, expose you to excessive service costs, and limit your ability to develop strategic plans for capital acquisition and cost management.

Current State Assessment

After exploring some areas where hidden costs can lurk, you now know how to begin identifying medical equipment service costs. To help develop a complete clinical engineering budget for your organization, it’s necessary to conduct a current state assessment that examines all areas of expenses — both listed in clinical engineering and in each department throughout the hospital’s general ledger.

An assessment will take a look at current costs for run rate of service contracts for all modalities, current annualized labor rates for technicians/managers and benefits, overtime, call backs, parts and vendor service expenses, training, etc. The assessment should be able to scrutinize all clinical engineering expenses over several years to uncover trending. This is a daunting task and may be easier and more cost effective to accomplish by partnering with a consultant who has experience in uncovering the true costs.
Identifying Hidden Expenses and Opportunities for Sustainable Savings

Technology. Training. Teamwork.

White Paper

Solutions for Sustainable Savings

Let’s take a look at some solutions that will help achieve sustainable savings. The quickest way to improve TCO is to reduce or eliminate the amount and length of costly service contracts by investing in technology, training and teamwork.

1 Technology

Improving the technology of your clinical engineering operations is key to reducing reliance on service contracts across all modalities and improving the uptime of critical medical equipment. Best in class clinical engineering programs must enlist pertinent and vetted technology to manage, monitor and track medical devices across the entire system 24/7/365.

Using a CMMS to manage medical equipment will help track several key factors needed to make informed decisions that will ultimately influence TCO. A best in class CMMS tracking and management system is comprised of a comprehensive inventory; inclusive of service history data, device alerts/recalls, operations benchmark metrics, and documentation of all service costs during the life of the asset. These are core areas of focus which ensure appropriate maintenance is performed, equipment is accounted for, and devices are safe for use in patient care, per regulatory and accreditation standards.

An effective CMMS will also capture common criteria like:

✓ Service response time
✓ Equipment downtime
✓ Preventive maintenance completion rates
✓ Repair turn-around time
✓ Clinical Engineering productivity
✓ Equipment acquisition costs
✓ Medical equipment alerts, hazards and recalls and documented actions

This evidence-based data will help you discern which technology will enhance patient care and plug any holes that may exist in healthcare delivery. Without reliable data, you will be making decisions on opinions or worse, assumptions.

In addition to effectively managing your current equipment, this data is critical when evaluating new technology and developing a multi-year capital plan. When it comes to the purchase of new technology, don’t just look at the sticker price. Rather take into consideration the maintenance over the course of its entire life cycle. How often will the equipment break down? How long do I have to wait for parts? How much do the parts cost? How about the cost to have a tech put the new part back in the machine? How long do patients have to wait, be rescheduled, or diverted?

As you may guess, OEMs aren’t motivated to be completely transparent with performance metrics like these nor do they have the ability to measure them very well. Take a Texas-based IDN, for example: Within a year, the IDN was able to slash nearly $370,000 in equipment management costs on a single modality by uncovering better alternatives for upgrades, repair, purchases and replacement. That’s the power of good data and smart investment in technology.
Training

There is a common misconception that a reduction in workforce can save money and increase revenue. This is truly a myth. In fact, an investment in your current workforce can help to reduce expenses by eliminating service contracts while providing increases in revenue by maximizing uptime. If there is a constant flow of repair work (which there typically is on a high-volume piece of equipment), it makes the most financial sense to invest in training your in-house staff to provide support versus relying on the OEM. This approach can significantly improve response time, reduce downtime and eliminate exorbitant costs by leveraging on-site expertise of individuals who are more familiar with the operations and needs of your hospital. If a department has already committed to a long-term service contract, centralizing them will allow clinical engineering to weigh the financial impact of breaking that contract (possibly through an out-clause) and paying any associated penalty fees versus relying on the OEM. This approach can significantly improve response time, reduce downtime and eliminate exorbitant costs by leveraging on-site expertise of individuals who are more familiar with the operations and needs of your hospital. If a department has already committed to a long-term service contract, centralizing them will allow clinical engineering to weigh the financial impact of breaking that contract (possibly through an out-clause) and paying any associated penalty fees.

A case in point is a northeast hospital’s recent investment in training their current clinical engineering staff. By partnering with TriMedx and investing in the hospital’s in-house staff, the hospital reduced its service contract dependency for many of its high-end systems including its CT, PET/CT and CR Readers. An investment of $60,000 for training an on-site engineer garnered a $300,000 return on investment for the CT and PET/CT and an investment of $4,000 in training on the CR Reader earned a savings of $100,000 for the year in PMs. With this continued focus on training and an overall investment of $180,000 for the year, the hospital took its in-house program from 40 percent to an average of 58 percent. Not to mention, the hospital was able to develop internal talent, hire more skilled professionals and instill trust with the end-user.

As proven in the example above, the investment in training can give a significant, and in some cases nearly immediate, return on investment. When you think of training, you must think beyond service training and start to think about all the ways you can use data and metrics from your clinical engineering program to help build facility wide training initiatives. Training for clinical engineering is necessary and needs to happen frequently, but how are you encouraging them to participate in a culture of knowledge sharing? How are you creating opportunities for employees to take ownership of his/her roles and responsibilities?

A staff comprised of fully engaged employees, improved equipment uptime and increased revenue while saving the system thousands of dollars a year in costly service contracts.
Optimizing your clinical engineering operations can deliver high utilization of equipment and support achieving your organization’s financial goals.
3 Teamwork

Finally, leveraging clinical engineering as a comprehensive medical equipment management function rather than just the team that fixes “broken equipment”, will promote knowledge sharing across departments, support strategic planning of asset acquisitions, and encourage effective partnerships throughout the entire system.

Remember, the clinical engineering department is data driven and can provide valuable information about inventory, equipment downtime, service costs and regulatory issues – all of which help the management team make informed decisions.

Elevating clinical engineering’s role within the organization can help you see the bigger picture of the state of your organization today and even give you a glimpse of what’s coming.

Optimizing your clinical engineering operations can deliver high utilization of equipment and support achieving your organization’s financial goals. To do so you must build and fully leverage a best in class clinical engineering department through the investment in technology, training and teamwork. The end result is the elimination of hefty, expensive service contracts saving thousands, maybe even millions of dollars annually.

Take the free TCO for Clinical Engineering online assessment at:

www.trimedx.com/tco-calculator