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## BioTronics Clinical Engineering

By David Tandet

It seems counterintuitive for Joseph A. Haduch, MBA, MS, director of imaging services for University of Pittsburgh Medical Center (UPMC) and BioTronics, to describe the organization's high-tech equipment management system as "homegrown," but that's an accurate characterization. "We've developed it over the last 20-odd years and have been able to tailor it to meet our needs. As we have expanded, our needs have changed. It's a server/web-based application, so we can access it from anywhere throughout our system. We have field service staff (clinical engineers) who perform repairs and maintenance using the wireless connectivity of our database to assist them in their daily routine."

David A. Hargraves, MBA, BS, AS, vice president clinical supply chain at UPMC and vice president operations at BioTronics, adds that one advantage "is the flexibility this affords. We can make adjustments just for us."

That adaptability is crucial to the unparalleled efficiency of the UPMC Clinical Engineering Department. The department was incorporated in 1985 as BioTronics Inc as a subsidiary of UPMC.

### FROM ONE HOSPITAL TO MORE THAN 500 LOCATIONS

UPMC Clinical Engineering—now BioTronics—started out in one facility, what is now UPMC Shadyside, with five people. Today, UPMC is a \$10 billion integrated delivery network (IDN) and finance system (IDFS) that provides health care in a variety of ways. The UPMC network comprises 20 acute care hospitals, 4,000 inpatient beds, cancer centers, ambulatory surgery centers, imaging centers, skilled nursing and long-term care facilities, and health insurance offerings. UPMC owns or leases more than 500 physical properties. BioTronics services more than half of those. The rest simply don't contain equipment that needs servicing. With a staff of 145, BioTronics has responsibility for the equipment management of more than 140,000 medical devices in the UPMC system.

As senior director, clinical engineering at UPMC, Keith W. Radakovich, BS, AS, oversees the daily operations, capital equipment planning and forecasting, customer satisfaction, and strategic planning for the BioTronics enterprise. He highlights the department's comprehensiveness and forward-looking mind-

set in serving UPMC: "Our scope is equipment management. Many clinical engineering departments are merely involved in preventive maintenance and repair, but we have an 'à la carte menu.' We are always investigating additional opportunities to reduce costs and improve patient care and safety while enhancing our service delivery."

Radakovich, Hargraves, and Haduch credit UPMC's leadership for the manner in which BioTronics has grown to become the robust entity it is today. Hargraves explains, "Clinical engineering at every hospital is not always treated the same by their executive leadership team. Sometimes they're treated as, 'those guys downstairs that fix stuff.' " That's a huge difference from the enlightened manner at UPMC that Hargraves describes: "Clinical engineering is actually treated as a member of the executive leadership team."

One benefit of this team perspective has been the effectiveness of the Fleet Equipment Initiative. This is a collaborative initiative that includes representatives from UPMC's facilities management, supply chain, senior administration, finance, and clinical engineering departments. The Fleet approach results in the identification and purchase of standardized equipment, which in turn results in standard protocols, lowered risks, and increased efficiencies such as cross-training for both clinicians and service staff. Hargraves explains this comes from the understanding that "rather than waiting for things to break, as they approach the end of their life we categorize all of the products using multiple parameters—how long is their expected product life, are they still under manufacturers' support, are replacement parts available, how frequently does the technology change, what's the criticality of the device itself as it affects the patients. Through the initiative, a scheduled replacement plan is developed spanning multiple years."

This result is BioTronics' high level of performance throughout the vast UPMC network.

"One thing we've integrated throughout the enterprise," Haduch says, "is a sort of hybrid brand of service. In some facilities we have in-house staff for specific modalities—specific pieces of equipment—but we also service facilities throughout the system through a field service group. The blend of in-house support and field service makes us much more efficient. It allows us to provide high quality and very little downtime." Twenty field service



personnel covering areas including general biomed, sterilizers, oncology, MRI, general radiology, CT, and PET CT travel to locations throughout UPMC.

Another unique aspect of the clinical engineering menu of services is the BioTronics Surgical Instrument Preventive Maintenance and Repair program involving comprehensive surgical instrument repair and refurbishment. Instrument repair technicians perform such tasks as sharpening, alignment, deburring, and demagnetizing of surgical instruments. Some instruments are serviced via in-house facilities and others are serviced by specially equipped vans—essentially, rolling machine shops—throughout the UPMC network, enabling on-location servicing.

Radakovich describes an additional innovative arm of the BioTronics program, the Networking Group, which enables BioTronics to embrace cutting-edge technology: “Our Networking Group, which was assembled 8 years ago, is our interface between clinical engineering and our traditional Information Services department. This is an increasingly important concept as more patient information is exported into the electronic medical record.” According to Radakovich, it’s another example of the UPMC executive leadership’s backing. “We saw the need and can thank our leadership for supporting our move in that direction.”

Haduch compliments the staff’s foresight. He points out that one reason the leadership remains poised to move in new directions is that the staff continues to exhibit competence and initiative. In basic terms, BioTronics is experienced in what it’s delivering.

Another new initiative involves BioTronics in the laboratory areas.

“Keith and Joe have built a [lab equipment] program,” Hargraves says. “One success is proven, and another opportunity comes along. Right now, we’re about to launch a program that involves servicing some of the UPMC facilities’ lab equipment. At many facilities around the country, the labs remain a bit of a mystery. There is a heavy reliance on service contracts. We said, ‘Look, Joe’s team provides service for CTs, MRs, and linear accelerators, so there’s no reason we shouldn’t be doing at least some portion of the lab equipment as well!’ We are in the process of finalizing all the details to launch the program later this year.”

Hargraves expands on why executive leadership support is critical for such a project, and why the synergistic nature of UPMC is so effective: “We have to request support staff, tools, and OEM training. UPMC provides these to us because of our continuing proven success. When they invest in us, we in turn deliver a strong return on that investment.”

## HELPING MEET THE CHALLENGE

“I think everyone would agree that these are challenging times in health care,” Haduch notes. “A lot of people run from the challenge, but we recognize it as a very good opportunity to prove what we can do (in addition to what we’ve been doing), as well as to meet the challenges that are going to face not only us but also the rest of the health system.

BioTronics helps other organizations meet the challenge. Primarily serving as clinical engineering for UPMC, it additionally offers services to medical operations outside the UPMC system. These include clinical engineering consulting services, in-house service programs, repair services for medical and imaging equipment and surgical instruments, and infection prevention. BioTronics already has the specially equipped vehicles, size, organized equipment care, and expert personnel to be able to become a cost-saving factor for medical locations who depend upon external sources for these services.

As part of UPMC, BioTronics is proud of how it supports community initiatives as it demonstrates a constant ability to provide opportunities for new employees.

“Western Pennsylvania has had a number of economic downturns over the years. So we’ll find many nontraditional students who have lost their manufacturing jobs and are looking for new career paths,” Hargraves says. He describes the relationships BioTronics has with Penn State and the Erie Institute of Technology. UPMC works with those schools in particular on the curriculum and also on sponsorship of their students for their internships.

Students who successfully complete academic programs experience a unique career ladder.

“When new grads are hired into the organization, they begin as generalists,” Radakovich says. “Most of our associates have a minimum of a 2-year biomedical degree; others have a 4-year degree. The generalists are introduced to a variety of equipment in the areas of biomed, radiology, sterilization, surgical, and networking. After several years in the generalist phase, associates make a determination on what specialty path they’d like to move toward.”

Like every other aspect of BioTronics, this approach reflects a well-planned, flexible environment that helps the entire UPMC integrated network function exceptionally effectively. ■

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