



Answering the Call

Baystate Medical Center's video upgrade provides a boost in communication

By Steve Harvey



Baystate Medical Center (BMC), located in Springfield, MA, completed a 641,000-square-foot expansion in 2012 that included the Davis Family Heart and Vascular Center, a new unit that houses six cross-functional surgical/endovascular suites. The \$296 million expansion, which also encompasses the MassMutual Wing, new patient care units, a new emergency department, and shell space for future growth, brings the facility to a total of 716 beds and 57 bassinets.

The only Level 1 trauma center in western Massachusetts, BMC is an academic, research, and teaching hospital that serves as the western campus of Tufts University School of Medicine. BMC is also the only provider of tertiary heart and vascular services in western Massachusetts and is responsible for more than 80 percent of all cardiac surgeries in the region. It is among the top three highest-volume medical centers in the state for coronary surgery and coronary angioplasty.

Human Circuit, based in Gaithersburg, MD, collaborated with healthcare industry AV technology advisors Drake Systems Group, headquartered in Yorba Linda, CA, on the control, routing, storage, and playout of video from OR cameras, scopes, and other medical imaging equipment in the Davis Center. “We provided project management, integration, engineering, implementation, and, ultimately, support,” says Jim Hatcher, chief technology officer with Human Circuit, a 46-year-old media integration solutions firm formerly known as Professional Products, Inc.

Human Circuit’s design brief was relatively straightforward, but the company’s solution was far from ordinary. “We needed to take high-resolution video and record it for review later,” explains Hatcher. “It’s a teaching hospital, so the idea would be, at the surgeon’s discretion, they would choose to record surgery or a procedure and then be able to view it later.”

But instead of purpose-building hardware or installing traditional purpose-built touch panels, he continues, “We built our control system around an HTML product. We call this our ‘tetherless’ workflow; not only is it wireless, but we’re also not tethered to a particular touch panel. We’re giving the end user the ability to use an all-in-one PC or tablet or iPad to control the system.

“All you’re really doing is navigating to a web page. If you have the credentials to go online and control the environment, anything with a browser can act as a control surface. That makes it incredibly flexible.”

Each of the six surgical suites has an attached control room, in which an operator can control the system using the installed PC. Human Circuit also installed specialized touch panels rated for use within the surgical

Baystate's six cross-function surgical suites can easily communicate with one another through various means included in an AV upgrade completed by Human Circuit.



field, enabling control from within the OR, if desired.

The operator routes the video outputs from the equipment in the OR as required. "The real power is taking the video feeds from the specialized medical gear and encoding that as H.264 high-def MPEG-4 streams, and recording those streams to hard drives," explains Hatcher. "There are encoders dedicated to recording video. We take the video output of, say, a scope, run that through a router, route it to an encoder, and record it to a hard drive."

There is a decoder built into the control system's HTML interface, he continues. "So when I open it up on a tablet or all-in-one PC, I can see a view of what is being encoded. As I'm viewing the video that's being displayed on my web page I'm also able, in real time, to route that video for encoding to a hard drive." Since that preview decoder operates in real time, he observes, "They could very easily do live streams if they wanted to."

The encoded video streams are recorded to an off-the-shelf server platform that acts as a cache. "The video recorded to that server is then FTP'd to the hospital's enterprise-class storage system."





Because there was also a need for communication capabilities within the system, Human Circuit integrated SIP (Session Initiation Protocol) phone functionality into its design. “You can communicate using an IP phone as part of our system design. We see that leading to this telehealth idea, the idea of having an interventional consult from outside the hospital to lend expertise before or during a surgery. So not only are we controlling the environment within the OR, we’re also controlling communications into and out of the OR.”

Because everything in the operating rooms utilizes SNMP (simple network management protocol), Human Circuit has been able to provide Baystate with real-time, continuous support by building a monitoring appliance into the system. “We’re based out of Gaithersburg, MD, and that’s quite a way from Baystate. But one of the big selling points of our solution, our design, and our approach is that everything we build has handles for remote connectivity and support. So for us to support them is very easy via VPN [virtual private network]. We can make a connection to them remotely and provide real-time support on-the-fly for anything they need.”

Baystate is a mission-critical, 24/7 environment, he notes, with the operating rooms booked around the clock. “We’re on call for them and we’ve been able to really successfully support them. Not that there are a lot of problems, but in the event of an issue, we’re able to solve issues or

push new firmware on the spot.”

In fact, Human Circuit builds pre-emptive support mechanisms into all of its systems, he reports. “This has to do with our own monitoring server, which checks the health of all the equipment. In the event of something overheating or falling offline — any of the parameters that might indicate a potential failure — we’re notified. Often we can respond before our client even knows about it. So we have that relationship with Baystate also; it works very well.”

Although Human Circuit has built 21 simulation centers around the country to date, this is the first active operating room environment for the company. “So it was very exciting, and we’re very proud of it. It’s a great system. Hopefully we will be able to build a lot more.” ■

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