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3 Points on Using Smart ORs to Grow Successful Hospital Departments

Written by [Laura Miller](#) | [July 06, 2011](#)

As many hospitals struggle to create successful inpatient programs in an unstable healthcare environment wherein traditional hospital services are increasingly out migrated to third party facilities, the Brain and Spine Institute at Sacred Heart Hospital in Eau Claire, Wis., has successfully devised a technology based strategy to simultaneously retain neurosurgical services within the hospital footprint and also improve their outcomes.



The deployment of two integrated operating room environments (Smart ORs) for neurosurgery has not only enhanced neurosurgical capability, quality, and competitiveness, but it has also entirely invigorated an institution well beyond the provision of neurosurgical services alone. Kamal Thapar, MD, a neurosurgeon with Marshfield Clinic and medical director of neurosurgery and tertiary care services at Sacred Heart, discusses three points on developing successful hospital Smart OR programs.

1. Meaningful adoption of technology to improve surgical outcomes. Hospitals must be prepared to adapt to the modern environment, which means reaping the benefits of new technology. "Technology is only meaningful if it can solve a basic clinical problem to the benefit of a patient's well being and outcome," said Dr. Thapar. "A perfect illustration is seen in the setting of brain tumor surgery, wherein we are operating on the organ of our humanity and as such the physical and emotional impact of the disease and its treatment can be particularly devastating. In many instances, aggressive removal of brain tumors is accompanied by a more favorable prognosis, provided that this can be achieved without causing harm or a neurological deficit."

Because many brain tumors involve or encroach upon eloquent brain areas, there is a need for great operative precision in selectively removing just the tumor without violating normal brain tissue. Traditionally, this was a frequently difficult task because the margins of many brain tumors merge imperceptibly with seemingly normal brain tissue. Accordingly, the completeness of tumor removal could not be definitively assessed intraoperatively, and objective adjudication of complete tumor excision would await postoperative MRI imaging.



A major paradigm shift occurred with bringing the MRI scanner into the operating room, and more specifically, directly into the operative field in context of the integrated Smart OR. Now surgeons can take an MRI during the course of the operative procedure, verifying, definitively, that the tumor has been completely removed prior to completing the operative procedure. "The iMRI SmartOR has created an environment that permits the surgeon to precisely navigate within the brain directly to the tumor, using the safest and smallest corridor of access, and also provide certainty of the completeness of tumor removal," said Dr. Thapar. "It is a major technical and conceptual advance in neurosurgery"

Sacred Heart has leveraged their success with the iMRI SmartOR for brain surgery and applied the same concept to reconstructive spine surgery with the deployment of a second CT-based Smart OR dedicated to spine surgery. Spinal reconstructions typically involve the placement of various spinal implants (screws and intervertebral devices) and the iCT Smart OR facilitates both the precise deployment and subsequent real time verification of implant position and placement during the course of the operative procedure. This reduces complications related to suboptimal instrumentation placement and need for revision surgery.

"When we perform spinal surgery in the iCT Smart OR spine suite, we know with certainty that the instrumentation is deployed at precisely the optimal position within the spine," said Dr. Thapar. "Furthermore, we are able to perform more complex reconstructive procedures through minimal access routes via smaller incisions because the iCT allows precise visualization of the spine without the need for extensive exposures, thereby reducing operative trauma, tissue disruption, instrumentation-related complications, need for revision surgery, operative time and most importantly, expediting recovery and length of stay."



2. Adopting technology necessitates building of high performance teams. Whereas the deployment of any new technology only offers the promise of a better value proposition for patients, providers and hospitals, the promise can only become a reality if it supported by a high performance team. "Although our Smart ORs represent the latest and greatest that technology has to offer, they are fundamentally mere pieces of hardware and software that can only be brought to life by the right team," says Dr. Thapar.

Accordingly, beyond the capital cost of the technology, Sacred Heart has invested heavily in developing a dedicated team of home-grown experts that can fully exploit its benefits. This team is comprised of operating room personnel, including nurses, surgical technicians, radiology technicians, and neurophysiologist — all of whom have been cross-trained with a defined, dedicated, specific and often a mission-critical role in embedding the technology into every neurosurgical procedure.

"Sure, I am proud of our technology, but I am most proud of our surgical team," says Dr. Thapar. "The technology challenged each team member to acquire a more sophisticated understanding of the

technology and the operative procedure and their relative roles in each. In doing so, they were able to focus their respective talents to the technology, processes and procedures in a way that not only translated into more efficient and effective operative care of patients, but also engendered pride of workmanship and a sense of meaningful contribution and purpose amongst the team."

The creation of a dedicated neurosurgical team has reduced operative times by 25 percent for all neurosurgical procedures, a phenomenon that Dr. Thapar attributes to the power of a dedicated neurosurgical team wherein the role of each member is clearly defined, the expertise of each evolves with education and repetitive experience, and variability is minimized.



3. Create an environment that encourages innovation. One of the biggest challenges for every organization, particularly hospitals, is remaining relevant in an increasingly competitive environment. "This has much less to do with a one-time acquisition of a costly piece of new technology, and far more to do with creating an enduring culture of innovation within our institutions," says Dr. Thapar. "Innovation is the only real currency of future success." With respect to technology and

other challenges, many organizations seek outward consulting services to guide them through these changes, but he suggests looking internally first.

"I see competing organizations using the same consultants/vendors, going to the same meetings, employing the same tactics, and fundamentally all playing from the same strategic playbook and then wondering why they fail to achieve a competitive edge," he says. "As hospitals, we all practice within our own unique clinical ecosystem, replete with our own unique challenges and constraints. Accordingly, generic solutions may not necessarily apply. You often need to have home-grown innovation and solutions to fulfill the specific needs of your patients. Instead of trying to find patients for a new hospital service, we need to innovate new and necessary services for the established needs of our patients."

In the case of the SmartORs, Sacred Heart Hospital was trying to fulfill the need of making brain and spine surgery more effective, by using technology to make neurosurgery safer, more precise and less invasive. "Our ability to make this happen didn't come from vendors or industry engineers who only offered generic solutions, it came from innovations from our own team who identified specific problems and came up with specific solutions," he says. "This included innovative networking solutions from our IT department, creating new surgical and operating room instruments on the part of our surgical team and new process and workflow solutions on the part of our nurses."

The Smart OR projects are examples of Sacred Heart's commitment to fostering an environment where hospital employees are empowered to creatively solve problems. "An important part of being successful is having a department that encourages and supports innovation," he says. "The more we allow our staff to come up with ideas, the faster we evolve."

Perhaps the best example of how innovation in one area encourages innovation in another came from the impact of the technological innovations in neurosurgery on other departments within the hospital. Although the Smart ORs are its most recent innovations, the neurosurgery department has been an early adopter of technology for almost a decade. Accordingly, it has served as a catalyst for other departments to introduce and incorporate innovative technological advances within their respective fields.

Most notable has been the development of the robotics program, which now features two Da Vinci robots each being heavily used by urology, gynecology and general surgery departments. Similarly, the

radiology department has fortified its endovascular and interventional services with early adoption of a dedicated interventional facility. As innovation proceeds throughout the hospital, it makes recruitment of the best and brightest specialists far easier who, in turn, further fuel the local innovative process.

"When we began innovating almost a decade ago, our goal was to embrace technology to enhance outcomes in neurosurgery," says Dr. Thapar. "As I look back, even greater than our impact on neurosurgery patients, has the transformation of a community hospital to a tertiary care center where technology and innovation thrives in many clinical departments and has been irreversibly embedded into the DNA and culture of the institution."

Learn more about Sacred Heart's Smart [ORs](#).