

# Medical Robotics Magazine

*The first and only commercial feature medical robotics news magazine, founded February 2007 by John J. Otrompke, JD, consultant and publisher*

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WEDNESDAY, OCTOBER 1, 2008

## Robotic Surgery Simulation: An Unintuitive Reflection

by Dr. Thomas Lendvay, MD

Robotic surgery is widely becoming the standard of care in the treatment of many diseases, but the rapid acceptance may be out-pacing the ability to adequately train surgeons. This past year more than half of all radical prostatectomies in the U.S. were performed with a surgical robot (<http://www.medicalnewstoday.com/articles/112626.php>) and since the FDA approval of the use of the da Vinci® robot for gynecological procedures in 2005 (<http://www.medscape.com/viewarticle/504035>), this field of surgery seeks to become the busiest user of robotic-assisted laparoscopy (RAL). Despite the rapid adoption of RAL surgery, long-term surgical outcomes data have yet to definitively demonstrate benefits over open surgical techniques. Prostate cancer margin positivity rates, even in the most experienced hands, have only equaled and not yet improved upon open surgical outcomes. Many argue that despite the 'intuitive' nature of RAL surgery, there is a learning curve and the dilemma lies in how to train future roboticists to be technically competent on their first RAL case.

There is growing traction in the medical community for the use of surgical simulation training for procedural skills acquisition. Driven by the demand for improved quality of care and accountability in surgical outcomes, increasing restrictions on the use of animal models, dwindling resident case logs, medico-legal pressures, and fiscal mandates for cost-effective performance many institutions are turning to surgical simulation for procedural training and even procedure credentialing. In pure laparoscopy, surgical simulation training, both dry lab and virtual reality (VR) modalities, has been shown to improve surgical performance. The realities of robotics, however, is that access to the surgical robot for practicing skills is limited since 1) institutions rarely have the financial or space resources to acquire a robot solely for training, 2) existing robots tend to remain utilized and stored in OR suites which prevents daytime access for surgeons to train, and 3) set-up of the da Vinci® system for training is somewhat cumbersome. Amidst growing acceptance of VR technology in laparoscopic simulation training, two companies have created robotic simulators that model da Vinci® telemanipulation – MIMIC Technologies, Inc., Seattle Washington and SimSurgery, Oslo, Norway. The MIMIC® simulator relies on a da Vinci®-like human-computer interface with telemanipulators similar to the real da Vinci® while the SimSurgery® simulator utilizes an existing laparoscopic simulator platform with software upgrades to simulate robotic instrument movements. The benefits of simulation training in robotics have yet to be formally evaluated, yet preliminary validation studies have demonstrated the ability for robotic simulators to discern experienced from non-experienced roboticists which is an initial validation criterion for applicability for any simulator. [1]

It remains to be seen if robotic surgical simulation will offer improved surgeon performance and patient outcomes, but the speed at which surgical robotics has been adopted in the United States warrants confirmation that all robotic surgeons are adequately trained to perform these surgeries.

[1] Lendvay, T., Casale, P., Sweet, R., Peters, C., Initial validation of a virtual-reality robotic simulator, *J Robotic Surg*, (o

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