GLOBAL HEALTH INTERACTION THROUGH TELESURGERY

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Introduction
The academic health center at RWJUH has instituted an image stream system in operating room #12 that has the ability to teach telesurgery to global sites. That is, surgeons in New Brunswick can perform a surgical procedure and have it seen (in conformance with HIPPA regulations) at any site including remote ones as long as there is internet capability. Not only will this be useful to teach surgical procedures to other surgeons on an international basis, but also to their entire team of nurses, anesthesiologists and operating room tech staff. One area of great interest to global surgeons learning robotic surgery such as on the da Vinci system. This image stream system will allow the teaching of this innovative tool to surgeons outside of our institution.

TeleSURGery Defined
Telecommunications in health care transmits both information and techniques in real time. With telesurgery, the surgical technique, the indications for the technique and the preparation and roles of each member of the operating team can be exchanged from one site to another via electronic communications. At RWJUH the IT equipment for recording and transferring the activity of the surgeon and the team are housed in an operating room specifically set up for this indication. The procedure is then transmitted to the site that has internet capabilities. No special equipment is necessary on the receiving side. All HIPPA rules are followed for each patient and with each procedure. Telesurgery communication systems will ultimately impact health care by not only training more surgeons on how to perform sophisticated surgical procedures, but also significantly decrease health care costs. That is, entire surgical teams can be trained without leaving their parent institution. It is clear that for surgeons to perform minimally invasive and robotic techniques, they need teams who can assist in the specifics needs of that procedure.

Telesurgery History
"Telesurgery became a possibility with the advent of laparoscopic surgery in the late 1980s. Laparoscopy (also called minimally invasive surgery) is a surgical procedure in which a laparoscope (a thin lighted tube) and other instruments are inserted into the abdomen through small incisions. The internal operating field may then be visualized on a video monitor connected to the scope. In certain cases, the technique may be used in place of more invasive surgical procedures that require more extensive incisions and longer recovery times.

Computer-assisted surgery premiered in the mid-1990s; it was the next step toward the goal of remote surgery. The ZEUS Surgical System, developed in 1995 by Computer Motion, Inc., was approved by the Federal Drug Administration in 2002 for use in general and laparoscopic surgeries with the patient and surgeon in the same room. ZEUS comprises three table-mounted robotic arms—one holding the AESOP endoscope positioner, which provides a view of the internal operating field, the others holding surgical instruments." (http://www.encyclopedia.com/topic/Telesurgery.aspx)

Advantages of telesurgery
One of the reasons that a telesurgery system is useful is its ability to teach advanced techniques, such as robotic surgery, to surgeons both locally and globally. Even if the site does not yet have robotic capabilities, at least the remotely placed surgeons are able to view how robotic surgery is performed. As noted in the diagram, with robotic surgery, the surgeon sits at a console several meters away and through the computer the robotic arms are directed in carrying out the dissection. As clearly noted, the sterile robotic arms are the only objects that enter through the incised skin and therefore recovery time and risk of infection is significantly lower. In addition, because of the computer interface, the normal hand tremor of the surgeon is filtered out. Lastly, this system makes it possible for two and three dimensional visualization of the operative field.

Unlike conventional surgery where the surgeon cuts and excises in real time, with a robotic system the surgeon can simulate the maneuver on the console and review it to be sure of its safety and efficacy. If it is the desired maneuver, the remote device is then engaged to perform this task.

Uses for the robotic surgical system
As noted on the da Vinci Surgical System website, this method of surgery is used in procedures that treat:
Bladder Cancer
Colorectal Cancer
Coronary Artery Disease
Endometriosis
Gynecologic Cancer
Heavy Uterine Bleeding
Kidney Disorders
Kidney Cancer
Mitral Valve Prolapse
Obesity
Prostate Cancer
Throat Cancer
Uterine Fibroids
Uterine Prolapse

Summary
Having a telesurgical system at our academic center, we have the ability to:
• Instruct new surgeons in complex techniques
• Utilize and train surgeons and their surgical teams in developing countries without them having to leave their medical center
• Exchange new techniques and procedures with surgeons on a global basis

Conclusion
As we utilize the image stream system for instruction in advanced surgical procedures, we believe that the global healthcare for all citizens will improve.