



Case Study:

Photo courtesy Story of Canada

Alberta Health Services

A recent medical conference provided the opportunity to take telehealth to the next level.

By Rick Perkins

When the 63rd annual meeting of the Canadian Urological Association (CUA) convened at Edmonton's Shaw Conference Centre in June 2008, local surgeons for Alberta Health Services (AHS) decided to take some 400 visiting urologists and related professionals out to the movies. They did not go to see the latest Hollywood blockbuster—rather, AHS used a combination of broadcast cameras, video conferencing equipment and projectors to display simultaneous live surgeries.

The urologists sat in a theatre at the Shaw Centre, approximately 2 km (1.2 mi) away from the Royal Alexandra Hospital, one of AHS's largest and longest-operating facilities, where the surgeries were taking place. The purpose of the demonstration was to allow them to compare two different prostate cancer surgeries. One of these two radical prostatectomies followed a traditional open approach, while the other used a robotic procedure.

"This was a first for urology in Canada," says Dr. Eric Estey, the Royal Alexandra Hospital's site chief of urology, who moderated the session at the Shaw Centre. "Watching the surgeries simultaneously allowed us to compare the two procedures in a way that has never been done in this country before."

The demonstration also showed how technology has the potential in other applications to bring together health care professionals from around the world and improve access to patient care, especially in more remote regions. AHS is one of the largest integrated health units in Canada and already had previous experience incorporating new technology into its health care practices. The organization was an early adopter of 'telehealth' video conferencing technology and is renowned internationally for advances related to medicine.



The robotic surgical system's camera arm used an endoscope to provide a 3-D view from inside the patient.

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The surgeries took place in the Royal Alexandra Hospital, one of AHS's largest and longest-operating facilities.

More than one million people receive their health care from AHS, with the telehealth program providing consultations for patients outside major population centres, as well as offering educational opportunities to health care professionals in remote communities. Yet, while the telehealth program uses video conferencing and networking technology to allow patients and health-care professionals to interact with each other, the technologies used for the surgery broadcast represented advances beyond the established norm.

Integrating rooms

Key to the surgery demonstration were two integrated operating rooms at the hospital, from which the demonstration's commentary was provided by Drs. Mike Hobart and Howard Evans, both urology surgeons.

In the first room, where the open surgery took place, AHS used Sony of Canada's BRC-Z700 compact robotic pan-tilt-zoom (PTZ) video camera mounted over the operating table, along with an Anycast Station, which allowed doctors to switch views between the camera and an endoscope inside the patient. The camera enabled the surgery's remote video shooting, while the endoscope allowed doctors to visually examine the interior of the patient's body without major invasive surgery.

Doctors began the procedure by introducing themselves to their remote audience through an XDCAM PMW-EX1 compact camcorder. All of the high-definition (HD) footage captured by the XDCAM, the BRC-Z700 and the endoscope was fed into a PCS-HG90 video conferencing coder/decoder (codec) at the hospital and transmitted via Internet Protocol (IP) connection to a second video conferencing codec at the theatre.

The theatre's codec fed the HD video stream into a VPL-FH300 projector, which in turn generated sufficiently large and clear images to allow urologists in the theatre to follow the operation in minute detail, providing resolution of 2,048 x 1,080 pixels and 6,000 lumens of brightness.

Meanwhile, in the second operating room, doctors performed prostate surgery with Intuitive Surgical's Da Vinci S robotic surgical system. This robot provided a three-dimensional (3-D) view from the endoscope inside the patient—not only to the surgeon in the room, but also through data streams fed into an SXRD 4K digital cinema projector to recreate the 3-D effect for the audience in the theatre.

Montreal-based HaiVision Systems' Mako-HD codec technology was used to transmit the robot's video footage over a high-speed network. Two HD video sources needed to be transmitted to provide the 3-D effect.

With resolution of 4,096 x 2,160 pixels, the projected images were displayed at four times the resolution of HD television. Lightspeed

Design, a visual media company based in Bellevue, Wash., provided the 3-D filters and polarized 3-D glasses for the audience.

"The stereo HD video we received at the conference centre was stunning," says Gayle Burnett, regional director for AHS's Centre for the Advancement of Minimally Invasive Surgery (CAMIS). "Most important for the effort was to retain

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synchronization between the video streams, so the stereo effect was maintained. The technology absolutely accomplished this, with imperceptible latency."

Supporting success

Matrix Video Communications—an audiovisual (AV) equipment provider and Sony partner with offices in Edmonton, Calgary, Vancouver, Regina and Saskatoon—assisted AHS in setting up and delivering the broadcast from both operating rooms.

AHS's 'Bringing Education, Advice and Multidisciplinary Care' (BEAM) Regional Telehealth Program, medical equipment provider Stryker Canada, high-speed network operator Telus Communications and hospital supply company Minogue Medical were also instrumental in providing support for the demonstration.

AHS's doctors were impressed with the results, as the simultaneous broadcast allowed the audience to compare two different procedures in a new way. With the images projected in HD (for the traditional open surgery) and HD 3-D (for the robotic surgery), the audience was able to follow both procedures in minute detail.

"It was fascinating to watch and the feedback we have received has been very positive," says Dr. Dan Birch, medical director of CAMIS. "It helps us better understand the possibilities with the technology that is becoming available in the region."

Rick Perkins is marketing manager for video conferencing, public displays and digital signage for Sony of Canada's broadcast communication solutions group. For more information, visit www.sonybiz.ca.



Digital cinema projection technology was set up in the theatre to recreate 3-D footage for the audience, using an HD video stream to ensure sufficiently large and clear images.



Visiting urologists sat in a theatre at Edmonton's Shaw Centre and viewed the simultaneous live surgeries in 3-D.

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