

Cardio clinic stresses tech

Dr. James Swan has transformed Rouge Valley Cardiology into an almost totally digital operation.

BY ISSIE RABINOVITCH

In northeastern Scarborough, far from the bustle of downtown Toronto, a cardiology clinic has been doing pioneering work in software and image management for the past six years. The project that began in 2000 under the direction of senior cardiologist, Dr. James Swan, has transformed Rouge Valley Cardiology, a seven-partner clinic, into a digital operation that does things in a way that other cardiology clinics in Canada must surely admire.

By 2003 RVC had become the first to integrate the results of stress echo and ECG into a single interactive report on the screen ("Our claim to fame," says Dr. Swan). The technology continues to advance. The continuing project makes for an interesting and instructive story, one that Dr. Swan is pleased to share.

Dr. Swan, from all appearances, appears to practice what cardiologists preach. He is trim and fit. An accomplished hockey player in his younger days, one who might have become a pro but for the talents that led him into medicine, he remains an avid runner to this day.

He's very enthusiastic about the technology in daily use at RVC, which he helped to develop and implement. It's been a big part of his work life for about six years, but it has also impacted the rest of his life, in a favourable way. More on this later.

In 2000, Dr. Swan and his partners decided to undertake the transformation of their clinic from analogue to digital echo and to develop a system that could display the stress echo images and stress ECG on a single interactive computer screen. There were also some secondary

goals, such as using digital technology to standardize reports, reduce staff and to achieve immediate reporting, making reporting from a remote location as easy as reporting in the office, becoming essentially "paperless", and achieving an easy-to-use system that improved patient care.

I hate to spoil a good story, but all objectives were met, some sooner and more easily than others. However, it didn't look very good back in 2000. There wasn't much available then for the small digital echo lab. The only ECG machine

Swan and RVC took no financial position in the project. In essence, RVC became a beta site for Prosolv and Quinton.

It wasn't easy, but progress was steady. Some milestones include:

- 2001, getting echo machines to integrate with Prosolv for 2D echo.
- Mid 2003, adding the Quinton Q-Stress image files and data to the final reports.
- Mid-2003, becoming the first clinic anywhere to simultaneously display the combined stress ECG and stress echo

images and their data on a single interactive computer screen.

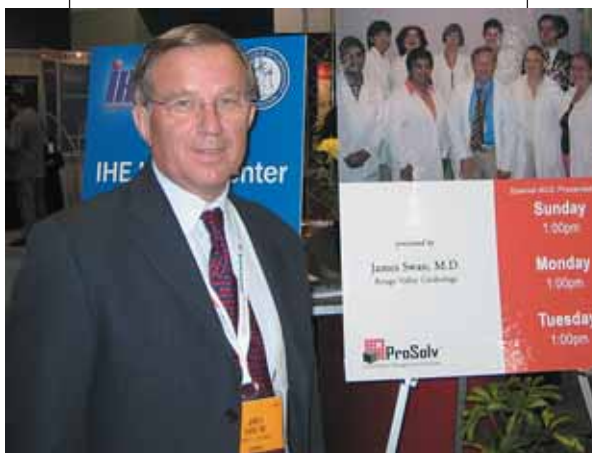
- Early 2006, refining the automatic interpreter to meet ACC, ASE and CSE guidelines.
- Mid-2006, spell checking has been added to the program and integration of 3D echo is under way.

The technology currently at RVC includes: a server-based office network with two reporting stations and laptops with reporting software. The network connects to the Internet via a T1 line. There are three HDI 5000 and two Q STRESS ECG Machines.

The RVC Echo Lab has Stress Echo, Stress Echo Doppler, Echo Doppler, Stress ECG with integrated Duke treadmill score, and Integrated Framingham risk score from Q Stress (soon to be available in the stress test reports).

RVC has successfully used this technology in over 7,500 stress echocardiograms. Studies can be read locally or remotely with all final reports generated through the central database.

RVC no longer uses ECG Paper, VCR tapes, CD ROMs, transcription or filing staff. The first year saw savings of \$38,000 although that was offset by software and



Dr. James Swan of RVC.

with digital output at the time was from Quinton. The big players, such as GE, HP, Toshiba, and Siemens were not interested in Swan's ideas. Instead, he asked Prosolv and Quinton to join him.

At the start, the team consisted of Prosolv engineers to support data management and reporting, Quinton engineers for stress ECG integration, ATL (Philips) engineers for ultrasound data and images, internal IT coordinator, and cardiology project leader, all supported by partner cardiologists, echo techs and staff. Dr.

installation costs. Annual software maintenance costs of \$15,000 kicked in after the first year but support staff numbers went down. According to Dr. Swan, the payback period was two years.

All database fields in the SQL database are searchable, permitting clinical research and outcome analysis. Individual studies can be copied to a CD and sent with a reader that any computer can view. This same program has been used successfully since 2001 for regular stress testing and echodoppler reporting in over 10,000 additional studies.

Reporting can be done from any computer with an internet connection, even a slow one. It is possible to generate the final report from anywhere in the world without secretarial help. Dr. Swan and the other cardiologists can travel, take vacations, or work from other locations and still keep current.

The remote reporting capability is part of Dr. Swan's lifestyle. He is pleased to list the places he has used it: Toronto (office and home) and other Ontario locations, Chicago, New Orleans, Phoenix, Seattle, Grand Cayman, and Vienna.



Anna Bailer in the RVC echo lab.

However, even Dr. Swan admits that the single most important benefit of the technology is the speed with which the patient and the patient's doctor get the result of a test. "The report is done and ready to send via e-mail before the patient is at the door," say Dr. Swan. When I had a stress echo test done at a hospital a couple of years ago, it took 2 weeks for the results to reach my GP and a bit longer to reach me. I watched as Dr. Swan was able to complete his final report within 45 minutes of the patient

leaving the treadmill. The technology saves money while enabling the cardiologists at RVC to see more patients in a day.

Dr. Swan reports that everyone in his clinic is pleased with the digital technology. It has become much easier to implement since RVC showed the way. Regardless, Digital Echo has been slow to catch on in Canada. I wondered why. Dr. Swan gave several possible explanations.

Cardiologists are skeptical, most think the cost of doing this is too high, there's a reluctance to trust computers, and education on the benefits of going digital has been slow to catch on. Two reasons are specific to Ontario: There has been no increase in technical fees in 15 years (although some money was made available for going digital in the first quarter of 2006), and Ontario hospitals are not digital due to inadequate funding and poor IT infrastructure.

However, to end on a positive note, Dr. Swan says that current guidelines and industry advances are making cardiologists rethink their position. Perhaps a visit to Scarborough would hasten the process. ●

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