



- BARBARA KERMODE-SCOTT -

## Secure wireless technology: The right answers for clinics in Alberta and British Columbia

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**D**octors have been typically slower than other business people to adapt to newer technologies and to convert from paper to electronic record systems. They tend to introduce changes to the medical records in their clinics when they can see very obvious medical, financial, lifestyle or technological benefits from doing so. However, in the last 15 years or so, more and more physicians have opted to introduce information technology systems and to computerize their offices. In recent years, a growing number of pioneering physicians have decided to set up wireless clinics (where computers are connected by radio signals rather than hard wiring). They enjoy the extreme portability and freedom that a secure wireless network can offer. They love being able to connect to their server and their patients' charts from wherever they are - anywhere in their office, the local hospital, or home.

Two practices - a group of orthopedic surgeons in Calgary, Alberta and a group of family doctors in Chilliwack, British Columbia - have each recently installed secure wireless technology. They both chose to install CLINICARE Corporation hardware (touch screen pen and tablet PCs, laptops and PC desktops) and software (a new Windows solution). These physicians' experiences with a wireless office have differed somewhat. The specialists first introduced computers to their office 14 years ago for administrative functions. The electronic medical records (EMR) functionality was introduced in the mid-1990s. The family doctors have been computerized for scheduling and billing for about eleven or twelve years. When they purchased an update six years ago they went with CLINICARE Corporation. The seeds were planted then for an eventual switch to electronic patient charting.

These days both clinics are enjoying their new technology - even more than they anticipated. They report that their innovative wireless offices are a big hit with their patients too.

### Secure wireless technology improves patient care, according to Mary Street Medical Clinic

The Mary Street Medical Clinic in Chilliwack, British Columbia, is located in an older building. The doctors and staff here found that as the clinic expanded they were rapidly running out of room, particularly for the ever-growing stacks of patients' charts. Mary Street had about 8,000 paper charts in the clinic and another 24,000 charts in basement storage. It didn't make sense to continue to add to that volume. The seven physicians - Dr. John Campbell, Dr. Vello Noble, Dr. Alan Whetter, Dr. Clark Kerr, Dr. Martin Dodds, Dr. Alan Quinn, and Dr. Bill Clark - and their staff made a couple of important decisions in early 2003. Firstly they decided to install computers at Mary Street and to transfer from paper to electronic patient charts. Secondly, they opted to install secure wireless

technology for the physicians rather than a wired computer system. A wireless network suited the physical layout of their older building better than a fully hard-wired system with workstations. Each of the 12 examining rooms at Mary Street has different dimensions. The doctors and staff here felt that it would be inappropriate to install standardized workstations in each examining room. It made more sense - financially and logistically - for the physicians to carry their computers with them from room to room. Thirdly, the clinic chose to purchase Windows-based software because of its many features (functionality, speed, security, confidentiality and legal protection).

There was a definitely a learning curve and some extra work at first for the staff and physicians when they went "live" with the new EMR and wireless network in September 2003 and began archiving the clinic's existing records. Fortunately Mary Street's physicians share a common dictating room. When one doctor encountered a problem, there was usually a colleague nearby who could solve it for them. After six months, physicians and staff had fine-tuned the system. They were having mostly trouble-free days and had learned how to take full advantage of their new electronic medical records. One year later both doctors and staff are extremely happy with the EMR and their wireless solution.

"I wouldn't say it was a big learning curve but everything was new," explains Mary Street's clinic manager Lila Bentley. "We certainly went through our growing pains but we're just constantly astounded what we can do now... So far we're very happy with our wireless network. It has been working very well for our doctors and office staff."

The new wireless network has also proven very popular with younger doctors coming to the office for electives or locums, adds Bentley.

"The younger doctors have grown up with the computer age," she says. "Our locums have stepped into the Windows-based system so easily. They have absolutely no problems. They just sit down and start using it."

Above all, the new wireless technology and EMR has improved the quality of patient care at Mary Street, stresses Bentley. For instance, the clinic is already beginning to employ the software for patient recalls and graphing of laboratory results.

"The best thing about this is definitely the power that it has to be able to actually improve patient care," agrees Dr. Martin Dodds. "Now we're utilizing all the wonderful features in CLINICARE's software... It's just so easy to find information... Now when I send a patient off to see a specialist, I include the patient's problem list, medications, and past medical history in the referral letter. I give the specialist a

comprehensive picture of the patient because I can do so quickly. Before, due to time constraints, I may not have been nearly as thorough at writing up the patient's medications and past history."

Once the charts had been populated with patients' data, the technology also made a huge difference for the front desk staff, he adds. It's a timesaver. It has certainly increased staff efficiency. For instance, both staff and physicians are enjoying the fact that prescription renewals now take significantly less time. What's more prescriptions printed directly from the EMR are legible.

Some of the physicians at Mary Street chose a laptop PC. Others have opted to use tablet PCs. Some doctors use hot keys for functions. Others use a stylus pen. They all enjoy the flexibility these small computers offer and carry their portable PCs from examining room to examining room. They like the fact, for instance, that they can turn the laptop or tablet PC so that the patient can easily read the screen. They can look at the computer screen and at the patient at the same time. They can even place their computer on the examining table.

"The ability to be able to move the tablet around the room is so nice," says Dr. Dodds. "I can even carry it as I'm walking down the hall. I can open a patient's chart and take a look at it before I go into the examining room - just as I would with a paper chart. You can't do that with a terminal that's in the room."

Security and patient confidentiality were certainly concerns before the installation but the clinic has encountered no security problems to date. The doctors haven't dropped their portable computers. None have been stolen or damaged by patients or their children. Access to patient charts is carefully controlled by a series of firewalls and passwords. The clinic keeps a spare ACER at all times for back up should there be maintenance or other problem.

For Mary Street Medical, it's so far, so good.

## Investing in a secure wireless solution pays dividends for Calgary surgeons

A group of six Calgary orthopedic surgeons opted to install secure wireless technology in their downtown clinic in 2000 because they felt it would improve many aspects of patient care, office processes in the administrative management of patient care and could be justified from a cost benefit perspective. The surgeons - Dr. James Mackenzie, Dr. Vincent Murphy, Dr. Maureen O'Brien, Dr. James Stewart, Dr. Jason Werle, and Dr. Lowell Van Zuiden - undertook a careful cost benefit analysis before the install. They were persuaded that there would be a worthwhile return on the expenditure required to upgrade their system from a hard-wired network to a secure wireless solution. "In essence we could deliver better patient care and have it make financial sense to do so," says Dr. Van Zuiden. The office now has 6 nursing stations - all with desktops and all hard wired to two servers. (One server is for back up). Each surgeon has a portable computer - either a laptop or tablet PC - operating on a wireless network.

These six surgeons had computerized their office's administrative processes (billing, scheduling, etc.) fourteen years earlier recognizing the cost benefits of information management in managing a complex orthopedic practice.

"We'd done a cost benefit analysis back in 1989 for the administrative component of our office processes," explains Dr. Lowell Van Zuiden. "It was quite clear that was the way to go. The resultant change management in our office processes exceeded our expectations. The question was could we achieve the same benefits with an electronic medical record?"

The surgeons individually see about 20 patients during one office clinic. They typically run about 14 offices a week in their clinic but have the potential to run 20 a week. Most patients visit just a few times - before and after their surgery basically and then for follow-up at six weeks/six months. This means the clinic has accumulated a very large number of charts - in the office and off-site. Currently the office has almost 80,000 charts. Transferring from paper to electronic medical records seemed to make sense.

Doing a cost analysis for the clinical side and particularly the electronic medical records was not quite as easy, adds Dr. Van Zuiden. However, the Calgary surgeons were trying to be more cost-effective and were willing to make a capital investment to change the business process of their office.

"We did time and motion studies looking at the charts - pulling the charts, filing records, creating charts and other related activities. Initially it was difficult to justify the investment to cover off the cost but we decided to move forward with an electronic medical record. The results were surprising. The one important parameter I hadn't factored in - because it was difficult to quantify - was the fact that this investment would save the surgeon time."

The real time saving for these surgeons was not from the administrative processes but from the functionalities the new software offered during a patient visit, he says. For instance, each physician has designed a template for the EMR for his or her practice. This provides a detailed record of the patient visit as well as a brief reminder of why the patient was last seen.

"The EMR allows me to capture much more clinical information than I would have done otherwise... It allows you to have a more complete record, a legible record and a more relevant record... That improves patient care, introduces consistency into the process, and decreases errors in the information gathering process - it also has relevance from a medical-legal perspective."

The surgeons also like the fact that if they write a prescription, that prescription is automatically recorded in the chart. The printed copy of the prescription - given the patient - is legible. The software can even refer to the system's database and list any interactions between the prescribed medication and other medications. The surgeons can use a mathematical scoring system to summarize a patient's medical condition (range of motion etc.) and progress. With the application of the electronic SmartChart they can calculate a patient's score right in the chart.

"It's fabulous," says Dr. Van Zuiden. "You begin to get this smart technology - this clinical decision support - that really gives the physician lots of opportunities to improve patient care and provide timely access to new information. You can't keep all this stuff in your head..."

The completion of the consultation letter also provides a huge opportunity for us to save time. I've tied my consultation letter to macro functions. The only part of the letter that I dictate now is what I refer to as the "cognitive" part. My dictation time has gone from 45 minutes to 10 minutes. We can add two or three more patients to a clinic."

With the wireless solution, the potential process advantages are huge, he believes. Physicians need to understand the process of their office - the way they do things, he explains. They need to break down this process into its component parts, and understand the details of the process and why it exists. Then they can see how information technology will help them either solve or eliminate some of those redundant aspects in their office.

In this clinic, the software is enabling the doctors to manage their practices in new ways. For example, the clinic now has a waiting list program that accurately shows how many patients/procedures or urgent cases are on each surgeon's waiting list - recorded by minutes of surgery time. Also, each surgeon has developed patient brochures that can be printed off and given to patients.

Dr. Van Zuiden certainly has no regrets about choosing CLINICARE as the vendor.

"This particular software is not that pretty but one of the nice things about it is that it's very robust," he says. "It works extremely well in terms of supporting what we do... It's as reliable as the day is long and it's always worked for us."

"We are never ever down," agrees office manager Kelly Webber. "Everyone else I've talked to, that uses a competitor solution, has had their system go down. They will be down a day and that's a disaster. Their software looks very nice and a bit prettier but ours is very reliable and fast. It's easy to move around in the chart."

Some of the clinic's physicians and staff embraced the new wireless technology. Others were reluctant at first, says Webber.

"We've trained and trained and retrained," explains Webber. "You have to be patient in order to allow somebody to feel comfortable. It's a matter of trust. Some people simply like paper."

The remote connectivity has been a boon to the surgeons, she adds. For instance, both the surgeons and staff enjoy the intranet email system that allows physicians and their nurses to send messages to each other via internal email. The internet allows the surgeon to remotely review, in a secure environment, office related correspondence including lab reports, referral letters and other relevant documents related to patient care. This task can be accomplished in the operating room while they are hooked into their EMR and waiting between cases.

"This system has improved patient care and saved both the nurse and the doctor a ton of time," says Webber.

One of the younger doctors enjoys loading his tablet PC into his backpack when he bikes to and from the clinic. Dr. Van Zuiden enjoys being able to log in to his patients' charts from the operating room. Some of the physicians take advantage of the remote connectivity to review their cases for the following day and forward notes to their nurse for the morning. What's more, these days when a surgeon checks out a chart at home, there's no risk of them leaving the chart at home the next day.

This group of surgeons has encountered no security or patient privacy problems with their wireless network. The whole system is backed up daily on site and once a week off site.

The opportunity to do an Internet search with the patient on current issues related to treatment of specific conditions has helped patients to understand their condition... The Internet is right there and on many occasions the physician accesses the Internet with the patient, searches for the information and provides the patient with the relevant web address.

At the end of the day it is about improved patient care. This EMR solution has helped our orthopedic surgical office to deliver a higher quality of care in an efficient and effective environment.

The workflow pattern in their clinic seems remarkably relaxed and quiet. The nurses' desks are remarkably clean as both text and images are filed electronically. The office gives an impression of efficiency.

## User input improves secure wireless technology, says vendor

Both the Chilliwack and Calgary clinics chose CLINICARE Corporation as their vendor. The Calgary-based company, first established in 1984, has been selling a "one stop shopping" total solution - both hardware and software - to medical group practices in North America for twenty years. In January 2005, KLAS Enterprises LLC ranked CLINICARE's EMR #1 in North America for practices with 6 to 25 physicians for the second year in a row. The secret of CLINICARE's success has been its policies providing the best support in the industry to its customers, and staff the excellent team of employees and shareholders, running the company as a business and the ongoing physician customer feedback regarding software development, suggests CEO and president Dennis Niebergal.

"Our users - physicians, nurses and managers - continuously provide us direction for software development and service delivery," he says. "We supply - we believe - the best computer solutions, software and service for physicians and medical offices. We always have provided "One Stop Shopping" for our customers so that it's very hard for us blame someone else for any of the problems. For instance, with security issues we don't take anything lightly. We work hard to provide secure, reliable systems with maximum server up time. Our systems always have secure and reliable backups to provide maximum protection to the information on the system as well."

Patient privacy, confidentiality and security are safeguarded by the use of medical report handcuffing, chart locking/chart access permissions, access logging by category, workstation access controls, user IDs and passwords (automatic password expiry, password complexity and workstation terminal activity timeout), and screen sleepers and two factor authentication menu passwords on applications and firewalls before any individual is allowed access to the system and / or application.

CLINICARE initially delayed the release of its secure wireless solution in order to make sure that it was very secure and that patient information could only be accessed by the physicians via the virtual private network (VPN), adds Niebergal.

"We incorporated a very strong and more expensive virtual private network (VPN) on top of the wireless network so that we could deliver the best secure wireless solution in the marketplace," he explains. It's more expensive, but security cannot be taken lightly regarding patient and physician confidentiality.

