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What Nissenblatt said he gained foremost by hiring a pharmacist was an employee who was "as familiar with the protocols as we were but was at a heightened level of awareness about the interactions of the drugs with patients' other comorbidities and medications."

The oncologists, he said, wanted someone on whom they could rely to recommend dosage adjustments for patients with renal dysfunction and help ensure the relatively safe administration of cancer treatments known to have toxic effects on the heart or lungs.

In addition to advising the oncologists about drug regimens, Peng was hired to oversee the preparation of injectable cancer treatments by a pharmacy technician, thus freeing up the oncology nurses from drug preparation and administration, Nissenblatt said.

"We felt there would be a win–win–win situation for everybody if we had a pharmacist," he said. "That is, we would improve the accuracy of treatment for our patients, we would improve the quality of our nursing for our patients, and at the same time we would improve our level of knowledge by the doctors about each of the protocols and make sure that they were absolutely perfect."

Economics pushes strategy. Goodin, at The Cancer Institute, said she knew of community-based oncology practices in addition to Nissenblatt's that had hired pharmacists to do more than prepare medications. Some of those practices hired their pharmacists to focus on therapies and continued to have the nurses prepare the drug infusions.

"But I think the bigger issue," she said, "is really this reimbursement [challenge] and using pharmacists to help them optimize product selection for reimbursement."

Goodin said she had recently spoken with a Philadelphia oncology practice that had hired a pharmacist to oversee drug purchases and therapies and help optimize the billing.

"The upsurge has certainly been in the last five years," she said, and more so in the past year.

Many of these oncologists, Goodin said, have joined forces rather than continue in solo practice and, in building a larger practice, remember the positive interaction they had with pharmacists during a medical fellowship or in a health system.

"They realize . . . the value that a pharmacist has brought to them from a clinical standpoint but also from an economic standpoint," she said.

Good for patients. Bowers, the health care consultant, said some of the large community-based oncology practices have added "retail pharmacies," with the office pharmacist filling prescriptions for oral oncology and oncology-related medications, as well as mixing the drugs for infusion in the office.

This arrangement, she said, is a convenience to patients who may have trouble obtaining these specialty medications at regular community pharmacies, and it is a recognition of the movement in cancer treatment from injectable to oral medications.

Goodin said that 85% of all cancer care now occurs at facilities other than NCI-designated comprehensive cancer centers and academic medical centers. "It occurs out in the community," she said.

With more pharmacists working in community-based oncology practices, Goodin said, "This is a continued opportunity for pharmacists to have a positive impact on patient care."

—Cheryl A. Thompson

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Telepharmacy project aids North Dakota's rural communities

In 2000, North Dakota found itself in the midst of a pharmacy services crisis.

The national pharmacist shortage had hit the mostly rural state particularly hard, said Howard C. Anderson Jr., executive director of the North Dakota Board of Pharmacy.

Newly graduated pharmacists were being lured to larger cities in other states where community pharmacy chains were offering big salaries and other incentives, leaving few pharmacists to take the place of those who were retiring in small, rural communities, Anderson lamented.

More than 25 rural community pharmacies in the state had recently closed, and 12 more were on the verge of shutting their doors.

North Dakota's rural hospitals, many of which had only one pharmacist or relied on contracted pharmacists who worked part-time at the facilities to keep inpatient pharmacies operating, were also challenged by the pharmacist shortage, Anderson said.

After contemplating several options, he said, the board decided to explore telepharmacy as a potential solution to address the predicament.

The North Dakota board spent the next several months reviewing various telepharmacy proposals and models, Anderson said, and worked on developing new rules and regulations that would support implementation of the practice, meet federal requirements and national accreditation standards, and ensure patient safety.

The College of Pharmacy at North Dakota State University (NDSU) soon joined the effort and applied for and received a federal grant from the Health Resources and Services Administration (HRSA) Office for the Advancement of Telehealth to pilot telepharmacy in the state.

North Dakota's telepharmacy project, which recently started its fifth year of the

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A North Dakota pharmacy technician at a telepharmacy remote site communicates with a pharmacist at a central pharmacy via an Internet audio–video teleconferencing connection.

HRSA grant, first tested its model in 2001 at four "central" community pharmacy sites and six remote sites, said Charles D. Peterson, dean of NDSU's College of Pharmacy at Fargo.

The project now has 57 participating sites, which includes 44 community pharmacies and 13 hospitals, he added.

"We are serving in excess of 40,000 rural citizens who previously did not have access to traditional pharmacy services that now have their pharmacy services restored," Peterson said. "These are communities that either lost their services, never had services, or were about to lose services because a pharmacist was about to retire."

The project has added $12.5 million to the economies of small towns in North Dakota by adding new jobs and restoring pharmacy services, he said.

For the project, a pharmacist at a central pharmacy site supervises a registered pharmacy technician at a remote telepharmacy site through the use of audio–video Internet conferencing equipment and digital imaging cameras, Peterson explained.

The pharmacy technician at the remote site prepares the prescription drug for dispensing, including entering the prescription and patient information into the pharmacy system, preparing the container label, and filling the medication vial. The pharmacist communicates to the technician and verifies the technician's work in real time over a secure Internet connection using the audio–video equipment.

The HRSA grant, said Ann Rathke, coordinator of the North Dakota telepharmacy project, covered 50% of the costs of audio–video teleconferencing equipment and installation for each telepharmacy site. The grant also covered the first year of Internet connectivity for each site, she added.

For telepharmacy remote sites that previously did not have a pharmacy technician, the grant paid the salary for a new technician for one year, Rathke said.

North Dakota's project is using Polycom VSX 7000 audio–video equipment, Peterson noted. Most of the sites have digital subscriber lines, or DSL, Internet connections, but some rely on T-1 lines. The connections must be protected with a firewall to ensure compliance with patient privacy laws.

The technician also sends digital images over secure Internet links of the prescriber's script, the medication's original manufacturer container, the prepared label, and a tablet or capsule, if appropriate.

The use of the digital images, Peterson said, helps validate that the patient is receiving the correct medication at the correct dosage. The digital photos can also be stored for later recall if necessary, he added.

Once the pharmacist has completed the final check of the prepared prescription, the pharmacist gives the approval to the technician to release the medication to the patient care area.

Safety concerns. Some people have expressed "high anxieties" that it appears that it is pharmacy technicians and not pharmacists who are dispensing medications at the telepharmacy remote sites, Peterson said.

But, he contended, although the pharmacist is checking the technician's work long-distance rather than within the walls of the pharmacy, it is the pharmacist at the central site who officially dispenses the medication to the patient and is held accountable for the remote site's activities.

Pharmacy technicians working at remote sites must be registered with the state board and be a graduate of a training program accredited by the American Society of Health-System Pharmacists, Peterson noted.

The technician must also have at least one year of work experience before practicing at a remote site, he added.

Peterson asserted that North Dakota's telepharmacy model is actually safer than when a pharmacist in the central pharmacy at a large hospital releases a medication from an automated dispensing machine because many of those systems do not have the audio–video connection that allows for conversation between the pharmacist and the nurse or pharmacy technician at the patient care unit.

"And we think that's problematic," he said. "Part of the feature of the North Dakota telepharmacy model is to keep the pharmacist in the health care loop in providing professional expertise, counsel, and guidance related to proper drug selection and monitoring. And that requires a verbal conversation."

Affordable. The board had considered using automated dispensing systems for its telepharmacy model, Anderson said, but decided that the cost of the equipment was too great for North Dakota's rural community and hospital pharmacies to afford.

A remote pharmacy site can install the audio–video equipment and digital imaging cameras for about a tenth of the cost of an automated dispensing system, Peterson said.

He argued that North Dakota's telepharmacy project provides another patient safety feature that goes beyond the average pharmacy practice: While pharmacies are required to offer pharmacist-provided counseling, which the patient can turn down, patients cannot leave the telepharmacy remote site with a prescription medication until the person receives counseling by the pharmacist over the audio–video connection.

Hospitals participating in North Dakota's telepharmacy project are exempt from the pharmacist-provided

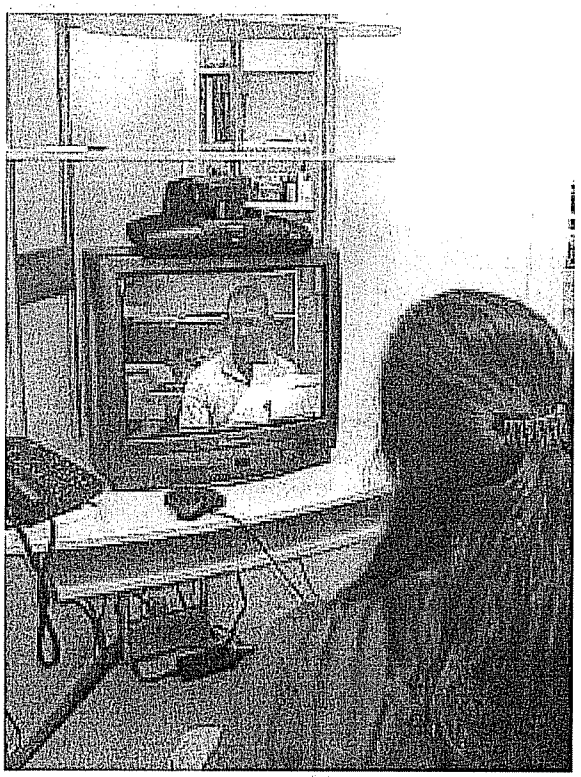
counseling requirement, noted John S. Skwiera, pharmacy director at Heart of America Medical Center in Rugby, a rural town near the Canadian border.

Hospital telepharmacy networking. As part of North Dakota's project, Skwiera's inpatient pharmacy has formed a telepharmacy network with six other rural hospital inpatient pharmacies in Devils Lake, Cando, Harvey, Rolla, Carrington, and Mandan to help provide vacation, after-hours, weekend, and emergency pharmacist coverage.

Each of the network's seven participating hospitals currently has only one pharmacist, he noted.

The facilities, Skwiera said, have "literally crossed across corporate barriers" to provide relief coverage for each other using North Dakota's telepharmacy model.

Three of the facilities joined the telepharmacy project last year, and the other four joined this year, he noted.



A pharmacist at a central pharmacy site provides medication counseling to a patient at a telepharmacy remote site over an Internet connection using audio–video equipment.

All of the facilities have the Polycom audio–video systems and digital imaging equipment installed in their pharmacies.

The seven pharmacists also have the equipment installed in their homes so that they can communicate with hospital technicians after hours or when inclement weather strikes and the pharmacist is unable to make it to the hospital.

"They are able to work from home as long as there is a technician onsite," Skwiera said.

The seven facilities have experienced only minor "speed bumps in the road," with the teleconferencing and digital imaging equipment, Skwiera said. Most of the problems have revolved around Internet connectivity issues, he said.

One telepharmacy site in particular, he noted, has had trouble with its system "freezing up" when transporting digital images.

The Internet connectivity at some of the pharmacists' homes has also been somewhat problematic, Skwiera said.

"Certainly, trying to connect everyone in a safe and secure network has been challenging, and I don't think we've quite reached that point where we're completely happy with it, but we are moving toward that," he said.

Pharmacists participating in the network arrange coverage with another pharmacist several weeks in advance when possible, Skwiera said. But, he said, because there are only seven pharmacists, the scheduling process is "mostly informal," especially when pharmacists are ill or need to leave town suddenly.

Some relief. The telepharmacy network, which Skwiera describes as a team, has helped to keep participating pharmacists "contented in their jobs."

"The Achilles' heels in these rural areas is that the hospital pharmacist has a ball and chain to their leg, and they don't feel like they can leave their work," Peterson said.

By participating in the telepharmacy network, he said, the pharmacists can feel more relieved about taking a vacation or calling in sick.

Peterson noted that Colorado-based Catholic Health Initiatives is creating a regional office in Fargo to establish a hospital telepharmacy network of its own in the state.

Following policies. Skwiera said that because the hospitals participating in the telepharmacy network came from a "broad spectrum of institutions," the facilities developed a joint policy agreement to ensure that patient care issues were addressed and that each hospital's policies were properly followed by all participating pharmacists and technicians.

Some of the seven hospitals participating in the telepharmacy network are accredited by the Joint Commission on Accreditation of Healthcare Organizations, and some are not, Skwiera said.

"Certainly, we have to be aware that we really can't supersede or change the policies of another hospital that we're doing telepharmacy with," he said. "We have to make sure that we practice accordingly so that we provide the quality of care necessary within the parameters of each institution's policies."

The networks have filed their joint telepharmacy policy agreement with the board of pharmacy for its review, Skwiera noted.

To date, he said, no patient safety issues related to the telepharmacy practice at each site have arisen. He attributed much of that success to the board of pharmacy ensuring that participating technicians are competently trained.

"None of this works without really good people that you trust at each site," Skwiera said.

—Donna Young

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