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*Ira Moscovice, PhD, Director
Mary Wakefield, PhD, Deputy Director*

Implementation of Telepharmacy in Rural Hospitals: Potential for Improving Medication Safety

**Michelle Casey, MS
Walter Elias, PhD
Alana Knudson, PhD
Walter Gregg, MA, MPH**

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St. Bernard's Medical Center, Jonesboro, Arkansas
Idaho State Board of Pharmacy
St. Luke's Wood River Medical Center, Ketchum, Idaho
St. Luke's Meridian Medical Center, Meridian, Idaho
Minnesota State Board of Pharmacy
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EXECUTIVE SUMMARY

The purpose of this project is: 1) to describe successful telepharmacy activities being implemented in rural hospitals and 2) to analyze policy issues related to the implementation of telepharmacy projects in rural hospitals, including the potential impact of telepharmacy use on medication safety for rural patients.

We defined telepharmacy broadly to include a range of activities such as having a small rural hospital fax or electronically transmit medication orders for review by a pharmacist at another hospital; use of remotely controlled medication dispensing equipment; and long-distance supervision of pharmacy technicians by a pharmacist at another site. Hospitals were defined as rural by their State Office of Rural Health or State Board of Pharmacy. The selected rural hospitals included several hospitals located in non-core counties and a few hospitals located in micropolitan counties, as defined by the federal Office of Management and Budget (OMB). One hospital is located in a rural census tract within a metropolitan county covering a very large geographic area.

Data for the project came from telephone interviews with State Boards of Pharmacy and rural hospitals and their partners implementing telepharmacy activities in ten geographically diverse states. In the selected states, we interviewed the directors of the State Boards of Pharmacy about the policy environment for telepharmacy and state laws and regulations governing telepharmacy. In each state, we conducted phone interviews with hospital Pharmacy Directors, CEOs and/or Directors of Nursing at rural hospitals and their partner organizations to gather data about the specific telepharmacy activities that are being implemented. The interview results and information on state laws, regulations and policies regarding hospital telepharmacy were summarized and analyzed to identify cross-cutting themes across hospitals and states.

Several different rural hospital telepharmacy models are being implemented around the country. A common telepharmacy model involves sharing of pharmacist services among hospitals in the same health care system. Other telepharmacy models involve a combination of system and non-system hospitals; a network of hospitals that have joined together to share telepharmacy and other services; contracting for telepharmacy services with a commercial telepharmacy company; or several small rural hospitals contracting with each other for telepharmacy services. The models being implemented appear to be a function of a variety of factors, including the state policy and regulatory environment, and rural hospital characteristics, including ownership and network relationships, the type of rural area (e.g., isolated rural or frontier versus more densely populated areas), distances between hospitals, hospital size, and medication order volume.

About half of the hospitals reported using grants for their initial telepharmacy set-up expenses, including federal, state and private foundation funds. Additional expenses for these hospitals came from their operating budgets; the other hospitals funded their entire telepharmacy efforts through their own operating budgets. Some Critical Access Hospitals reported that Medicare cost-based reimbursement is helping them pay for

telepharmacy. However, other hospitals indicated that lack of funding was a barrier to purchasing updated medication dispensing equipment.

The vast majority of hospitals reported that they track medication error rates internally, and some hospitals indicated that they have seen improvements in their medication error rates since implementing telepharmacy activities. Other measures being tracked by some hospitals include: accuracy of order entry, turnaround time on order entry, number of after-hours orders, follow-up on after hours orders, over-rides of automatic dispensing machines, productivity of pharmacy and nursing staff, and increases in billable revenues. Two multi-hospital telepharmacy projects reported that formal evaluations were conducted in partnership with universities; another conducted an evaluation of its telepharmacy pilot project for a report to the State Board of Pharmacy.

Several themes emerged from our interviews with hospitals and state boards of pharmacy and reviews of state laws and regulations. First, while we were able to identify examples of rural hospitals that were implementing telepharmacy initiatives in several states, the use of telepharmacy technology to provide pharmacist services to rural hospitals is not widespread. Second, although telepharmacy is of considerable interest nationally and in some states, the majority of states have not yet adopted regulations that define the circumstances under which telepharmacy activities are allowed in hospitals. Many of the hospital telepharmacy efforts that are underway are pilot projects or are operating under temporary waivers of state regulations. In a number of states, the primary focus of telepharmacy regulation has been on retail settings.

The study interviewees reported that federal regulations were not a barrier to telepharmacy implementation in rural hospitals. Joint Commission standards were a major motivation for some accredited facilities to use telepharmacy for after-hours medication order review, but were not a factor for the small rural hospitals that are not accredited. In a few states, some hospitals appear to be implementing telepharmacy activities without state regulatory approval, due to the absence of state regulations or confusion about processes for obtaining approval. Several hospital respondents suggested that the adoption of state regulations defining allowable telepharmacy activities could encourage the implementation of telepharmacy in additional rural hospitals.

Rural hospitals are increasingly motivated to improve medication safety, but face growing competition for a limited supply of pharmacists interested in practicing in smaller rural communities. At the same time, pharmacy technology is becoming more widely available and affordable. These factors suggest that interest in implementing telepharmacy activities in rural hospitals is likely to grow in the near future, and State Boards of Pharmacy will face increasing pressure to address telepharmacy regulatory issues in both hospitals and retail locations.

Discussions about telepharmacy regulation are occurring in the context of a broader national debate about the pharmacy work force implications of changes in the practice of pharmacy. These changes include rapid growth in the volume of medications dispensed, the expansion of pharmacists' medication management responsibilities and overall workloads, and the evolution of pharmacy automation technology. As they consider the adoption of telepharmacy regulations, State Boards will need to address a

number of policy issues, including the physical location of pharmacists providing telepharmacy services; the types of technology to be used; the minimum amount of time a pharmacist must be on-site at a hospital; and the roles of pharmacists, pharmacy technicians and nurses in medication distribution systems. State regulations that allow rural hospitals to make appropriate use of pharmacy technology are needed if telepharmacy is to realize its potential for increasing access to pharmacist expertise in rural hospitals and helping to achieve the overall goal of improving medication safety.

INTRODUCTION

Many rural hospitals, especially Critical Access Hospitals (CAHs), have limited hours of on-site pharmacist coverage (Casey, Moscovice and Davidson, 2006; Cochran et. al., 2008). In addition, a significant number of pharmacists in small rural hospitals are primarily retail pharmacists, who provide part-time pharmacist consultant services in hospitals and nursing homes in addition to their retail responsibilities (Casey, Klingner and Moscovice, 2002).

The Medicare Conditions of Participation for non-CAH hospitals do not specify a minimum level of pharmacist staffing. They require a hospital to have “pharmaceutical services that meet the needs of the patients,” and “a pharmacy directed by a registered pharmacist or a drug storage area under competent supervision” (42CFR482.25). The regulations further specify that “a full-time, part-time, or consulting pharmacist must be responsible for developing, supervising, and coordinating all the activities of the pharmacy services,” and that the pharmaceutical service must have “an adequate number of personnel to ensure quality pharmaceutical services, including emergency services.” The Conditions of Participation for CAHs do not address pharmacist staffing. CAHs are required to have “policies for the storage, handling, dispensation, and administration of drugs and biologicals” and “a drug storage area that is administered in accordance with accepted professional principles” (42CFR485.635).

Joint Commission accreditation standards and the American Society of Health-System Pharmacists’ minimum requirements for hospital pharmacies specify that all medication orders should be reviewed by a pharmacist before dispensing except in emergency situations. If pharmaceutical services can not feasibly be provided on a 24-hour a day/7 day a week basis, the standards require that an on-call pharmacist be available and that a pharmacist subsequently reviews all after-hours pharmacy activity (ASHP, 1995; Rich, 2004).

Several studies have concluded that limited pharmacist hours adversely affect the contributions that pharmacists can make to medication safety in rural hospitals. As a result of pharmacist vacancies, rural hospital pharmacists in Illinois reported a reduction in the amount of time available to provide clinical pharmacy services and an increase in pharmacy related medication errors (Schumock et. al., 2001). On-site pharmacist hours in rural community hospitals in four western states were significantly associated with pharmacists being involved in initial ordering of antibiotics and providing active oversight of antimicrobial use (Stevenson 2004). Limited access to pharmacists in six Nebraska CAHs resulted in greater opportunities for prescribing errors, unauthorized drug errors, and improper dose errors to reach the patient (Jones et. al., 2004). In a national survey of rural hospitals with less than 100 beds, the amount of pharmacist staffing was significantly related to active pharmacist participation on key hospital committees that address medication issues, including pharmacy and therapeutics, medication safety or patient safety, and infection control committees (Casey, Moscovice and Davidson, 2006).

Telepharmacy arrangements have been proposed as a way for smaller rural hospitals with limited pharmacist coverage to obtain additional pharmacist resources (Lordan, Vorhees, and Richards, 2002; Peterson et al, 2007). The National Association of Boards of Pharmacy has defined the practice of telepharmacy as “the provision of pharmacist care by registered pharmacies and pharmacists located within US jurisdictions through the use of telecommunications or other technologies to patients or their agents at a distance that are located within US jurisdictions” (NABP, 2006).

Telepharmacy has the potential to improve the quality of pharmaceutical care and decrease medication errors and adverse drug events in small rural hospitals. However, because telepharmacy is relatively new, there is little literature in peer-reviewed journals. Limited information on telepharmacy projects is available in other formats such as articles in newspapers and trade journals, and grant reports. The available articles on the use of telepharmacy tend to describe telepharmacy activities in a single hospital or a small number of hospitals (Keeyes et. al., 2002; Woodall, 2004; Runy, 2005; Boon, 2007). This project aims to fill gaps in existing knowledge about telepharmacy in rural hospitals through an in-depth analysis of telepharmacy activities in rural hospitals in several states and policy issues influencing the adoption of telepharmacy in rural hospitals.

II. BACKGROUND

The practice of pharmacy is regulated by state boards of pharmacy, and traditionally pharmacists have been regulated by the state in which they are physically located. The use of pharmacy technology and increased focus on medication management therapy (MMT) as a pharmacist activity separate from the dispensing of medications has raised new policy and regulatory issues for state boards of pharmacy. Some states are beginning to address the practice of pharmacy via data, voice and video links, and remote dispensing of medications in their state pharmacy practice acts (Gebhart, 2005). The National Association of Boards of Pharmacy (NABP) regularly updates the *Model State Pharmacy Act* and *Model Rules of the National Association of Boards of Pharmacy* to assist states in keeping their pharmacy practice acts and regulations updated to reflect changes in the practice of pharmacy. In 2006, the Model Act was revised to specifically address MMT services and telepharmacy issues (NABP, 2006). The amended *Model Act* includes provisions for: 1) recognizing MMT services as an element of pharmacist care; 2) allowing the provision of pharmacy services via remote pharmacies and remote dispensing sites when appropriate; 3) requiring the registration of non-resident pharmacists who, outside of a licensed pharmacy, provide telepharmacy services to in-state patients; and 4) recognizing and providing a model for the independent practice of pharmacists outside a pharmacy setting.

The Association of Health System Pharmacists' (ASHP), the national professional association for pharmacists who practice in hospital settings, adopts policy positions regarding the practice of pharmacy in hospitals and other health institutions. The ASHP House of Delegates adopted a policy position regarding regulation of telepharmacy services in 2007. The policy position advocates that boards of pharmacy “adopt regulations that enable the use of United States-based telepharmacy services for all

practice settings.” In addition, it defines several issues for boards of pharmacy to consider when drafting regulations for telepharmacy service, including: 1) education and training of participating pharmacists and technicians; 2) information system requirements; 3) remote order entry, remote prospective order review, remote double-checking of the completed medication order before dispensing, actual dispensing, and patient counseling and education; 4) licensure (including reciprocity) of participating pharmacies and pharmacists; 5) service arrangements that cross state borders; 6) service arrangements within the same corporate entity or between different corporate entities; and 7) service arrangements for workload relief in the point-of-care pharmacy during peak periods. The AHSP policy position further identifies a need to explore and resolve additional legal and professional issues in the provision of telepharmacy services from sites outside of the United States (AHSP, 2007).

III. PURPOSE OF PROJECT

The purpose of this project is: 1) to describe successful telepharmacy activities being implemented in rural hospitals and 2) to analyze policy issues related to the implementation of telepharmacy projects in rural hospitals, including the potential impact of telepharmacy use on medication safety for rural patients.

We defined telepharmacy broadly to include a range of activities such as having a small rural hospital fax or electronically transmit medication orders for review by a pharmacist at another hospital; use of remotely controlled medication dispensing equipment;¹ and long-distance supervision of pharmacy technicians by a pharmacist at another site. Hospitals were defined as rural by their State Office of Rural Health or State Board of Pharmacy. The selected rural hospitals included several hospitals located in non-core counties and a few hospitals located in micropolitan counties, as defined by the federal Office of Management and Budget (OMB).² One hospital is located in a rural census tract within a metropolitan county covering a very large geographic area.³

This study addresses the following research questions:

- What types of telepharmacy activities are being implemented in rural hospitals, why are the hospitals implementing them, and how are they funding their telepharmacy activities?

¹Several types of medication dispensing equipment (e.g., Pyxis and Omnicell) and medication management systems are used by hospital pharmacies. Product names in this report describe the equipment used by the interviewed hospitals and are not an endorsement of any particular product.

²OMB defines two types of rural counties: micropolitan and non-core. Counties with a cluster of at least 10,000 persons can qualify as the central county of a micropolitan area, with outlying counties included in the micropolitan area if commuting to the central county is 25 percent or higher or if 25 percent of the employment in the outlying county is made up of commuters from the central county. Non-core counties are the remaining rural counties with no cluster of 10,000 or more persons.

³These rural census tracts within metropolitan counties covering large geographic areas are considered by the Federal Office of Rural Health Policy to be rural for purposes of eligibility for Federal programs (<ftp://ftp.hrsa.gov/ruralhealth/Eligibility2005.pdf>).

- How are the hospitals evaluating the impact of their telepharmacy activities on medication safety?
- To what extent are state and federal regulations regarding hospital pharmacy and Joint Commission medication management accreditation standards influencing the use of telepharmacy by rural hospitals?

IV. METHODS

For this project, we first reviewed the literature on telepharmacy in peer-reviewed journals, along with articles in newspapers and trade journals, and grant reports to identify states where rural hospitals were participating in telepharmacy activities. We also reviewed materials on the telepharmacy policy positions of national organizations, including the National Association of Boards of Pharmacy and the Association of Health System Pharmacists. Next, we surveyed the directors of all 50 State Offices of Rural Health (SORHs) by e-mail regarding rural hospital telepharmacy initiatives in their states. Based on the results of the literature review and the e-mail survey, we selected a geographically diverse group of states where rural community hospitals were implementing telepharmacy initiatives, including Arkansas, Idaho, Minnesota, Montana, North Dakota, Oklahoma, South Dakota, Texas, Utah and Washington. In the selected states, we interviewed the directors of the State Boards of Pharmacy about the policy environment for telepharmacy, and state laws and regulations governing telepharmacy.

We asked both SORH and State Board of Pharmacy representatives to identify rural hospitals in their states that have implemented successful telepharmacy programs. At identified hospitals in each state, we conducted a phone interview with the Pharmacy Director, the CEO and/or the Director of Nursing to gather data about the specific telepharmacy activities that are being implemented. The interview questions were designed to gather data to address the research questions regarding rural hospitals' telepharmacy activities and relationships with telepharmacy partners; funding; and the impact of telepharmacy activities on medication safety.

The phone survey protocols for the Board of Pharmacy and rural hospital representatives were developed based on a review of the literature and with input from Todd Sorenson, PharmD, a pharmacist in the College of Pharmacy at the University of Minnesota who is knowledgeable about rural hospital pharmacy issues. The analytic approach to this project was primarily descriptive. The interview results and data on state laws and policies regarding hospital telepharmacy were summarized and analyzed to identify cross-cutting themes across hospitals and states.

V. RESULTS

Many Boards of Pharmacy are just beginning to address telepharmacy issues. For each state in the study, this section briefly summarizes the current status of state laws and regulations governing telepharmacy in hospital settings, followed by a description of telepharmacy activities being implemented at one or more rural hospitals in the state.

Arkansas

Arkansas Board of Pharmacy

Arkansas has specific regulations for hospital pharmacies covering off-site order entry, review, and approval (Arkansas Code 04-05-0004). The regulations, which were initially adopted in 2005 and revised in November 2007, provide that the Arkansas State Board of Pharmacy may approve a request for off-site order entry when a hospital pharmacy can “demonstrate that the procedure will result in an improvement in patient care by increasing the amount of time of pharmacist involvement in the process of medication review for safety and efficacy prior to the administration of the medication to the patient.”

The pharmacist-in-charge of the hospital pharmacy is required to submit a written request for off-site order entry a minimum of 30 days prior to the Board meeting at which the pharmacist seeks Board approval. The hospital’s request must be accompanied by policies and procedures for off-site order entry. The regulations define pharmacist qualifications off-site order entry, and require that the hospital have a clearly defined back-up system in the event of connection or communication failure and/or the need for on site pharmacist is deemed necessary.

The Arkansas regulations allow the use of fax and e-mail for interpretation and verification by a support hospital for remote dispensing or dispensing by a nurse. Pharmacy technicians are not allowed to make decisions or dispense medications. In Arkansas, all hospitals with 50 beds or more are required to have an employed or contracted pharmacist, who is licensed in the state of Arkansas, and on-site at the hospital at least 40 hours a week. Hospitals with less than 50 beds are required to have a pharmacist on-site at least five days per week to perform and review pharmacy dispensing, drug utilization and drug distribution activities. Hospitals receiving remote pharmacy support must meet these on-site requirements. On occasion, remote pharmacy is also allowed when a pharmacist is on-site but unable to attend to immediate medication needs. In either case, the on-site pharmacist retains full responsibility for oversight of hospital pharmacy operations at all times.

The only hospitals currently using remote order entry and review in Arkansas are system hospitals. The Board of Pharmacy does not allow telepharmacy as a cost-cutting measure such as reducing staff at a small hospital (e.g., by reducing hours or eliminating on-site pharmacists) to balance out the costs of the telepharmacy service.

Arkansas hospitals involved in telepharmacy services include two hospitals in the White River Health System: White River Medical Center in Batesville, which is providing telepharmacy services to Stone County Medical Center, a 25 bed Critical Access Hospital in Mountain View, as part of a off-site order entry pilot project; White County Medical Center is providing services to White County Medical Center South, both in Searcy; and St. Bernard’s Medical Center in Jonesboro is providing telepharmacy services to Cross Ridge Community Hospital in Wynne.

State law does not prevent freestanding hospitals from contracting with another hospital or pharmacy service for after-hours coverage or even contracting out their pharmacy service entirely. However, all pharmacists used must be licensed in the State of Arkansas. As of mid-2007, the Board had not received any requests from freestanding hospitals to establish telepharmacy services.

To obtain approval for using telepharmacy services, a hospital pharmacist submits a written request to the State Board of Pharmacy 30 days before the next board meeting. The request describes all needed policies and procedures, and backup systems in case of system failure. The pharmacist then appears before the board to present the case for implementing telepharmacy services. The Board feels that making the on-site pharmacist completely responsible for on-site operations is the best way to address quality and safety concerns.

Cross Ridge Community Hospital in Wynne and St. Bernard's Medical Center in Jonesboro, Arkansas

The Arkansas State Board of Pharmacy recently approved a telepharmacy project in which St. Bernard's Medical Center (SBMC), a 378 bed hospital in Jonesboro, Arkansas, will provide telepharmacy services to Cross Ridge Community Hospital in Wynne, Arkansas as well as to St. Bernard's 60-bed behavioral health hospital. Cross Ridge is a 15 bed Critical Access Hospital, and is managed by SBMC through a lease agreement. A third hospital, managed by SBMC, will not be part of the telepharmacy project since it is on a different computer system. Telepharmacy was scheduled for initial implementation in March 2008.

Each of the recipient hospitals has a pharmacy staffed by a pharmacist 40 hours per week. Telepharmacy will provide after hours and weekend coverage. SBMC will provide administrative and operational services. Administrative services include maintenance of the computer system, formulary management, and in one hospital, representation on the pharmacy and therapeutics (P&T) committee. Operationally, SBMC will provide after hours order entry and drug information. The pharmacist at Cross Ridge will be on call and the hospital will also hire another pharmacist to supplement on call duties.

SBMC dispenses medication at both hospitals through a Pyxis Medstation system. Registered nurses will be removing medication from the cabinets. There are no plans for any A/V-based telepharmacy systems. The purpose of the on-call pharmacist is to provide medication that is not in the Pyxis system after hours. SBMC will be examining the cost effectiveness of the on-call pharmacist versus an A/V system in the future.

As a hospital system, SBMC's goal is to constantly improve its medication distribution process. At SBMC, the pharmacy moved to 24 hour from 16 hour coverage and implemented a Profile system to enhance their Pyxis Medstation system. With a Profile system, a nurse can not remove medication from a Pyxis machine until a pharmacist has reviewed, verified and approved the order. Medication access is limited to what is in the patient's medication profile. Six months ago, SBMC brought its behavioral health

hospital up on its computer system and Pyxis Connect. Future plans are to move the behavioral health hospital to the Profile system as well.

The motivation for telepharmacy was to provide 24 hour pharmacist oversight to improve medication safety. Cross Ridge is accredited by the Joint Commission. Joint Commission reviews scheduled at both Cross Ridge and the behavioral health hospital in 2008 were major drivers to implement telepharmacy. Cross Ridge set up a non-pharmacist first dose review process for nurses to implement. During normal pharmacy business hours, the pharmacist would retrospectively review any orders that were received after hours. Likewise, at the behavioral health hospital, the pharmacist would retrospectively review any orders that were received after hours. Neither of these processes was felt to be adequate to ensure medication safety. Therefore, SBMC implemented pharmacist first dose review as part of the newly implemented telepharmacy process.

Funding for telepharmacy came from the hospital's general fund and from a grant to purchase a pharmacy computer system for SBMC and the two recipient hospitals.

In proposing to implement telepharmacy, SBMC was required to personally present its policies and procedures and all agreements with contracted hospitals to the state board of pharmacy. The process was approved by the state board of pharmacy without complications.

No Medicare, Medicaid or 3rd party payer policies affect SBMC's use of telepharmacy. The hospital's legal department approved the telepharmacy project and found no liability or risk management issues. However, for liability purposes as well as to comply with state of Arkansas regulations, competency training on all aspects of the telepharmacy project was required.

SBMC plans to evaluate the following outcomes in telepharmacy: 1) medication errors; 2) turnaround times associated with order entry; and 3) overrides – the number of times a nurse must bypass the first dose in the Pyxis system in emergency situations.

Idaho

Idaho State Board of Pharmacy

Idaho has two sets of state regulations regarding telepharmacy (Idaho Administrative Code 27.01.01). Sections 261-264, adopted in 2005, address the pilot project phase of a Telepharmacy Program for rural hospitals. Sections 265-269, adopted in 2006, address a Remote Dispensing Pilot Program for retail pharmacies.

The purpose of the Telepharmacy Program pilot project is to “allow the provision of pharmaceutical care through the use of telecommunications and information technologies to patients at a distance from the pharmacy and pharmacist providing the pharmaceutical care.” The regulations allow the Executive Director of the Idaho Board of Pharmacy to authorize a “rural institutional facility” to participate in a telepharmacy

pilot project. Rural institutional facilities are defined as critical access hospitals or other facilities that are operating in a health professional shortage area and are unable to otherwise obtain pharmaceutical care on a timely basis 24 hours per day.

The Telepharmacy Program regulations require a contract between the rural facility and the central pharmacy that employs consulting pharmacists who provide pharmaceutical care to patients at the rural facility. The contract must identify the directors of pharmacy at the two pharmacy locations and contain a description of the telepharmacy services to be performed, including protocols for communication of drug orders and dispensing of drugs at the rural facility. The contract must be approved by the Executive Director of the Board prior to initiating telepharmacy services, and the term of the contract is limited to two years.

The Idaho telepharmacy regulations allow a rural hospital with an approved pilot project to fax or electronically submit medication orders for review by a pharmacist in a 24-hour central pharmacy in a larger hospital, with medication administered by a nurse using a medication dispensing cabinet. The receiving party must be a nurse. Having a pharmacist provide long distance supervision of pharmacy technicians at a rural hospital is currently not allowed under state law.

The physical location of the pharmacist providing telepharmacy services is restricted to an institutional pharmacy licensed in the state of Idaho. The pharmacist can not be at home and the location also can not be a mail order pharmacy. Although all the pharmacists providing telepharmacy services do not need to be licensed as pharmacists in Idaho, the location where they provide the telepharmacy services must be an institutional pharmacy licensed in Idaho. Telepharmacy is not handled differently if it is used as a full time system to provide pharmacy services in a hospital or only used to provide after hours coverage.

The purpose of the Remote Dispensing Pilot Program is “to allow the provision of pharmaceutical care through the use of telecommunications and Remote Dispensing Machines to patients at a distance from the pharmacy and pharmacist providing the pharmaceutical care.” The regulations provide that “pilot remote pharmacies will only be approved for operating in medical care facilities operating in areas otherwise unable to obtain pharmaceutical care on a timely basis.” An operating memorandum is required between the responsible pharmacy and the Board of Pharmacy that includes the operating protocols applicable to the Pilot Remote Pharmacy. At all times when the automated pharmacy system is being operated, a pharmacist licensed in Idaho or a technician registered in Idaho must be present at the pilot remote pharmacy and a pharmacist licensed in Idaho must be available at the responsible pharmacy for immediate communication through a two-way audio and video hookup.

As of July 2008, one telepharmacy pilot project in a rural hospital had been officially approved by the Idaho Board of Pharmacy, the St. Luke’s pilot project described below. In addition, one remote dispensing pilot project in a retail pharmacy had been approved by the Board. At the end of July, the Idaho Board of Pharmacy is scheduled to meet and

discuss remote dispensing pharmacy issues, including controlled substances and emergency access in the absence of a pharmacist.

St. Luke's Wood River Medical Center, Ketchum with St. Luke's Meridian Medical Center, Meridian, Idaho

St. Luke's Wood River Medical Center (Wood River), a 25 bed Critical Access Hospital, is one of four hospitals owned by the St. Luke's Health System in Idaho. It is the only rural hospital in the system. Telepharmacy services are delivered to Wood River by St. Luke's Meridian Medical Center, a 152 bed hospital in Meridian, Idaho. Wood River has a pharmacy staffed by 3.8 FTEs. A pharmacist is on site at the hospital approximately 10 hours a day, 70 hours a week.

All campuses participating in the three year old telepharmacy program are on the same computer system. Orders are scanned by a physician order management system and sent to the local hospital pharmacy during normal business hours and to the Meridian campus after hours. If there are any after hours' questions, nurses can call the Meridian pharmacist. Wood River uses Pyxis equipment and Med Administration Check (MAK®), a Siemens software product using barcode technology that enables the pharmacist at a remote location to approve an order before a nurse administers a medication.

The desire for safe medication delivery and the Joint Commission requirement that the hospital incorporate a review process into its medication delivery 24/7 were prime motivations for implementing telepharmacy. The Wood River telepharmacy pilot program was approved by the state board of pharmacy. The only change to state regulations that would allow Wood River to make greater use of telepharmacy would be a regulation allowing the use of A/V equipment.

Pyxis cabinetry and the POMS software were in use prior to the pilot. All other costs were covered by the hospital's operations budget, as will a scheduled upgrade to Omnicell equipment to replace an outdated Pyxis system. No federal, state or foundation grants were used for telepharmacy funding. Medicare, Medicaid and 3rd party payer policies do not affect Wood River's use of telepharmacy.

Liability and risk management issues have been on the positive side. The director of nursing reports that some errors were captured, lowering the hospital's liability risk. There is no routine monitoring of the telepharmacy program. The hospital monitors by exception, i.e., they follow up if there is a reported problem. When the after-hours system went on line, there were some delays in responsiveness on the Meridian side but that was corrected through an increase in after hours staffing. About one year ago, the health system organized a quarterly meeting where all pharmacists in the system gathered to discuss patient safety issues.

Although it is not in their immediate plans, the director of pharmacy would like to see the system change to enable order processing via the internet from a remote site such as a pharmacist's home. The hospital has had preliminary discussions about the use of telepharmacy when it opens an eight physician clinic in two years.

Minnesota

Minnesota Board of Pharmacy

Minnesota does not have specific laws or regulations addressing telepharmacy. Telepharmacy in both hospitals and community (retail) pharmacies is handled through the variance process. Applicants can apply for a variance to a specific regulation; a committee of the Board reviews the request and makes a recommendation to the Board about whether to approve the request. The Board usually sets conditions for approval. An example of one requirement is that the pharmacist has to be on duty at the pharmacy when a pharmacy technician is there; some applicants have applied to have the pharmacy technician supervised remotely by a pharmacist using A/V equipment. This has been primarily in community pharmacies, although one urban hospital has a variance for their outpatient clinic, which is on the other side of the street. In this case, medication comes to the clinic via a tube from the hospital, and the patient gets counseling through an A/V link to the pharmacist in the hospital.

The variance process is the same, regardless of the regulation for which a variance is being requested. The committee to review variance requests includes two Board members, two inspectors, and the Associate Director for Compliance. They recommend that the Board accept the request, deny it or ask for additional information. The regulations have three general criteria for variances: 1) they must not adversely affect health and safety; 2) the alternatives proposed must be at least as good as the requirements in the regulations; and 3) compliance with the regulations would cause an undue burden.

The Board has adopted telepharmacy guidelines, but these primarily apply to community pharmacies. Hospital telepharmacy activities that would be allowed by variance include: 1) having a rural hospital fax medication orders or transmit them electronically for review by a pharmacist at another hospital and administration of medication by a nurse; 2) having a pharmacist at another site remotely control access to medications at a rural hospital using medication dispensing equipment; and 3) having a pharmacist provide long-distance supervision of pharmacy technicians at a rural hospital. Telepharmacy variances have usually been for after-hours coverage, not for 24/7 coverage. Some variance requests have cited Joint Commission standards as the reason for applying for a variance.

Several variances involving remote order entry review (having a pharmacist at another hospital review electronically transmitted medication orders) for hospitals have been approved by the Minnesota Board of Pharmacy, including: 1) St. Luke's in Duluth is doing order entry review for several rural hospitals in Northeastern Minnesota; 2) Several rural hospitals in the Allina Health System are receiving night pharmacy coverage from St. Francis Regional Medical Center in Shakopee; 3) the Virginia Regional Medical Center is using Cardinal Health for off-site order entry; and 4) Several hospitals in the Fairview system are receiving remote pharmacy service from the Fairview Northland Regional Hospital in Princeton.

Minnesota regulations require both the pharmacy and the pharmacist to be licensed in Minnesota. In May 2007, new rules were adopted defining a central service pharmacy as one that handles any part of the process such as data entry or utilization review. The Board was initially going to require that a central service pharmacy be located in the state. It decided to drop the in-state requirement but still requires an out-of-state pharmacy to be licensed as a non-resident pharmacy if it ships medications into Minnesota.

The Board has some concerns about allowing a pharmacist to review orders in their home or anywhere that is not a licensed pharmacy. Board inspectors have authority to inspect licensed pharmacies and to respond to complaints by visiting the pharmacy. They don't have authority to inspect a pharmacist's home, and are concerned about distractions and privacy issues. They also have some concerns about spill-over issues. For example, by law a pharmacist can give immunizations and Minnesota Medicaid pays pharmacists to provide Medication Therapy Management, but the Board has said that a pharmacist can't rent an office somewhere and get a pharmacy license just to give immunizations or provide MTM.

Safety is the Minnesota Board's number one concern. They have allowed variances in both hospital and community pharmacies, but are a little less concerned about safety in hospitals, because hospitals have at least one more licensed person, e.g., a registered nurse, looking at the medication before the patient gets it. The Board is concerned that it is tempting for chains to try to cut costs in the community pharmacy, saying they can't afford to have a pharmacist on-site, because a pharmacy technician is paid much less than a pharmacist. The Board has access to all community pharmacy records except financial records, so they can't judge the financial condition of the pharmacy. The variance process takes into account whether it will improve safety. It is the gold standard to have a 24/7 pharmacist in the hospital, but they know that some rural hospitals can't do that.

In terms of state law or regulatory changes that would allow hospitals to make greater use of telepharmacy, the Board is willing to look at models. Some Board members and inspectors have expressed reluctance about some variance requests, but most requests have been approved in the past two years. For community pharmacies, the Board uses a distance guideline of 30 minutes travel time - about 20 miles.

Ely-Bloomenson Hospital in Ely and other rural hospitals in Northeastern Minnesota, with St. Luke's Hospital in Duluth, Minnesota

Ely-Bloomenson Hospital in Ely, Minnesota is a Critical Access Hospital that, along with several other small rural hospitals, receives telepharmacy services from 257 bed St. Luke's Hospital, in Duluth, Minnesota. Ely-Bloomenson employs three full time pharmacists that serve the hospital as well as a retail pharmacy. Pharmacist coverage averages 40-45 hours/week. Telepharmacy services are used for after hours and weekends.

In 2002-2003, the CEOs of Cook Hospital in International Falls, Minnesota and Ely-Bloomenson Hospital convened a Pharmacy Information Services committee as part of a regional strategic planning process. They received a \$500,000 grant from the Minnesota Office of Rural Health and Primary Care. The grant required a 25% match and funded seven northeast Minnesota hospitals' purchase of identical McKesson dispensing cabinetry. The idea was that in the future the cabinetry could be connected to a central location to be used primarily to cover needs of the emergency room. Each member then contributed several thousand dollars toward a grant writing fund administered through a 501c3, the Minnesota Wilderness Healthcare Coalition. Two years later, the Coalition was awarded \$1.3 million over three years by the Agency for Healthcare Research and Quality (AHRQ). The AHRQ grant connected all members to St. Luke's. The grant expanded the program to cover eleven hospitals and clinics over a three year period and installed high definition cameras in each of these facilities. It paid for A/V equipment, St. Luke's pharmacist and administrative expenses, and bedside bar coding for three member facilities.

As part of SISU, an information technology cooperative, Ely-Bloomenson Hospital is part of a 16 hospital consortium, and shares MediTech technology with SISU members, including a common IT platform for administrative and clinical functions and data storage capacity. When a St. Luke's pharmacist reviews a medication remotely, it is entered into Ely-Bloomenson's billing system.

Ely-Bloomenson Hospital came online with St. Luke's two and a half years ago. The two hospitals have no ownership or network arrangement. A motivation for the telepharmacy project was a study done by the University of Minnesota Rural Health Research Center on pharmacist supply in rural communities and potential access problems. The need to be on-call all the time was an impediment to recruitment of pharmacists in rural communities. The hospital was motivated by the need to improve safety and improve access to pharmacists. Also, if pharmacists were to become unavailable to remote areas, they could be positioned to explore virtual pharmacy options.

Evaluation of the telepharmacy project was built into the AHRQ grant. It included an analysis of prevented errors, but no attempt was made to quantify cost savings. The College of Pharmacy at the University of Minnesota-Duluth conducted the evaluation. Nurses, pharmacists and Emergency Department physicians were surveyed to determine whether telepharmacy helped with their productivity; positive findings resulted from that survey. Now that the AHRQ grant has elapsed, individual hospitals pay an annual fee to St. Luke's for telepharmacy services.

For the Ely-Bloomenson Hospital, the refill and dispensing of a prescription is the relatively easy part of telepharmacy. The hospital sees patients who can't drive 100 miles for chemotherapy or who have complex specialty pharmacy needs. Pharmacists are being asked more and more to be part of integrated treatment teams for complicated cases. As pharmacy becomes more specialized, some of these issues are beyond the scope of training of the rural hospital's pharmacists. The hospital is in discussions with the University of Minnesota - Duluth about online consultative services.

An issue in the real time delivery of this service is whether the University of Minnesota - Duluth has the resources to fulfill the needs of the hospital consortium.

The Minnesota Wilderness Healthcare Coalition maintains planning funds that it uses to fund grant writing activities including the expansion of telepharmacy. One area under consideration is planning for an on-demand consultancy for specialty pharmacy.

Montana

Montana Board of Pharmacy

Montana state regulations address the use of telepharmacy (Administrative Rules of Montana, Rule 24.174.1302 -Telepharmacy operations and Rule 24.174.1303 - Remote Telepharmacy Dispensing). The rules are not specific to hospitals. A site cannot be licensed as a remote telepharmacy site if it is located within a ten mile radius of an existing pharmacy. Telepharmacy requires a live computer, video and audio link, as well as the site complying with all the requirements of the Montana pharmacy statutes and rules.

The following types of activities are allowed under state law and regulations in Montana: 1) having a rural hospital fax medication orders or transmit medication orders electronically for review by a pharmacist at another hospital, with medication administration by a nurse; 2) having a pharmacist at another site remotely control access to medications at a rural hospital using medication dispensing equipment; and 3) having a pharmacist provide long-distance supervision of pharmacy technicians at a rural hospital.

To obtain a telepharmacy license in Montana, the facility has to have a pharmacist in charge who is licensed in Montana and has to have a Montana registered Certified Pharmacy Technician with at least six months of active experience as a pharmacy technician. The consulting pharmacist does not have to be physically located in Montana, but must have a Montana license. State regulations do not handle telepharmacy differently if it is used as a full time system to provide pharmacy services in a hospital or only used to provide after hours coverage.

Hospitals operating as telepharmacy sites need to have their pharmacies licensed as telepharmacy sites. Currently, Montana grants three separate categories of pharmacy licenses. To address the different types of pharmacy practices, the board is discussing implementing an endorsement on the license (e.g., telepharmacy, nuclear pharmacy, etc.). St. Vincent's in Billings and Wheatland Hospital in Harlowton were the first hospitals and are currently the only hospitals in the state registered to use telepharmacy. One retail pharmacy in West Yellowstone also uses telepharmacy.

The Montana Board of Pharmacy views in-person pharmacy service delivery as the best and the safest option. However, they recognize that many pharmacists are spread very thin in their practices. Telepharmacy may improve some of the timeliness and accuracy of medication order reviews.

One way the Board ensures continuity of pharmacy services is the requirement that the overseeing pharmacist must have at least one visit per month at the remote pharmacy. The rule requires a complete monthly inspection of the remote telepharmacy site, with inspection criteria to be included in the policy and procedures of the site. The inspection reports must be available for review by the Board inspector. Although only one inspection per month is required by rule, the Board recommends as many visits as necessary to ensure proper ongoing analysis and proper outcomes that ensure patient safety.

The Board of Pharmacy does not see the need for any state law or regulatory changes that would allow hospitals to make greater use of telepharmacy at this time. It is committed to providing legitimate pharmacy services to patients using innovative approaches, if needed. Joint Commission standards are not really an issue, as most rural hospitals in Montana are CAHs and are not Joint Commission accredited.

Wheatland Memorial Hospital, Harlowton and St. Vincent's Hospital, Billings, Montana
Wheatland Memorial Hospital is a Critical Access Hospital with six acute care beds. The hospital has a medication room and a pharmacist is on site once a month. Inpatient pharmacy services are provided through a contract with St. Vincent's Hospital, a 300 bed tertiary hospital, in Billings. St. Vincent's has 26 pharmacists on staff providing pharmacy coverage 24 hours a day, 7 days a week.

For acute care patients at Wheatland, medication orders from the physicians are faxed to St. Vincent's. Medications are then removed from the medication room at Wheatland, the log is checked, and the drugs are replaced. St. Vincent's provides telepharmacy services for outpatient care at Wheatland because it has a management contract with Wheatland and employs the administrator.

For outpatients at Wheatland, a pharmacy technician takes the medication information for the outpatient and faxes it to the pharmacist at St. Vincent's. The pharmacist inputs the data, and a machine dispenses the medication at Wheatland. Security is provided via fingerprint. Medications are labeled with a barcode. If the correct barcode is used, the system prints a patient label with the barcode on the bottle. The outpatient pharmacy at Wheatland is state of the art and includes a counseling room with a video phone so the patient may visit with the pharmacist at St. Vincent's. Initially, patients were asked if they would like to step into the room and talk to the pharmacist, now they expect that they will do so. Approximately 100 drugs are stocked in the dispensing machine. St. Vincent's will be expanding their courier services, which occur nightly. Physicians and mid-level providers fax maintenance medication orders so the courier can bring them for patients.

St. Vincent's uses two different computer systems – one for inpatient and one for outpatient. St. Vincent's outpatient pharmacy operates under an inpatient pharmacy license whereas Wheatland's outpatient pharmacy needs a separate license.

The hospital began implementing telepharmacy in May 2004. The motivation was need. Wheatland County, which covers 1,500 square miles, had only one pharmacist who left in 2003. After the retail pharmacy closed, the physician clinic, which is attached to the hospital and staffed by hospital physicians, saw patient numbers decline. They were losing business because of the lack of retail pharmacy services in the community. Physicians may dispense pre-packaged medications if there is no pharmacist within 10 miles; however, the physicians wanted pharmacist oversight. Wheatland Hospital wanted to make sure that pharmacy services were available locally.

To implement the telepharmacy project, changes to state rules were needed. The hospitals worked with the Montana Board of Pharmacy to develop draft regulations. The project operated for two years as a demonstration project and was part of the rule making process. Based on the experience, final regulations were enacted.

The hospital received a private foundation grant for the purchase of equipment and the initial start-up costs. The hospital's Board of Directors targeted pharmacy services as a top priority and used funds from this grant to purchase all equipment. Wheatland loses approximately \$8,000 to \$10,000 per year on pharmacy services. Insurance reimbursement is not sufficient to cover costs. About 2/3 of patients have prescription drug coverage but they lose money on every prescription. About 1/3 of patients are uninsured and either pay up front or, if they can't afford the medications, get samples or sign up for pharmaceutical manufacturers' support programs. Reimbursement under Medicare Part D is not adequate to cover their costs.

Wheatland Memorial Hospital is not Joint Commission accredited. It has not had any liability or risk management issues related to the use of telepharmacy. The telepharmacy component is included in the hospital's liability policy. There are a number of checks and balances and barcode verifications in addition to the pharmacist checks. The hospital has had very few medication errors in four years and most have been caught before they reached the patient. The hospital thinks that having pharmacist involvement before physicians dispense medications alone is very important. The pharmacy technicians at Wheatland are very good at picking up on potential problems. In addition, there is a great deal of conversation among the pharmacists, pharmacy technicians, physicians and mid-level providers.

The outpatient pharmacy started with an average of four prescriptions per day and now dispenses 18 to 20 prescriptions a day (420/month). Clinic visits have increased since telepharmacy began. Wheatland Hospital has looked at a Pyxis medication dispensing cabinet for the hospital but does not have the finances to purchase it. St. Vincent's does not plan to have any additional telepharmacy sites.

North Dakota

North Dakota Board of Pharmacy

North Dakota state regulations address the use of telepharmacy, including a section that specifically addresses telepharmacy in hospitals (North Dakota Administrative Code, Article 61, Section 61-02-08-08). These regulations, which became effective in

2001, provide that pharmacist supervision of a hospital pharmacy may be accomplished via audio link, video link, and computer link, if the hospital has a registered pharmacy technician on duty.

The regulations do not allow a prescription order to be released for administration to a patient until it is approved by a pharmacist via the audio link, video link, and computer link. The policy and procedures of the hospital pharmacy must address all aspects of the telepharmacy operation, including control of the pharmacy by the registered pharmacy technician in the absence of the pharmacist. Contractual arrangements must be in place for the supervision of the technician by either the consultant pharmacist, another hospital pharmacy with adequate staffing, or a contracted pharmacist providing coverage when pharmacist staffing is not provided at the hospital.

The following types of activities are allowed under state law and regulations in North Dakota: 1) having a rural hospital fax medication orders or transmit medication orders electronically for review by a pharmacist at another hospital, with administration of medication by a nurse; 2) having a pharmacist at another site remotely control access to medications at a rural hospital using medication dispensing equipment; and 3) having a pharmacist provide long-distance supervision of pharmacy technicians at a rural hospital.

North Dakota regulations do not handle telepharmacy differently if it is used as a full time system to provide pharmacy services in a hospital or only used to provide after hours coverage. One of the goals of the telepharmacy regulations is to move CAHs to full-time pharmacy coverage via video and audio connection. Currently, many CAHs in North Dakota have limited oversight by off-site pharmacists.

The Board of Pharmacy approves and issues a telepharmacy permit for each hospital pharmacy using telepharmacy. An application for the permit is available at www.nodakpharmacy.com. Plans must be submitted to show where the equipment will be located, and how it is accessed. Eleven hospitals, including eight CAHs, currently have sub class K telepharmacy permits in North Dakota. These hospitals are located in Ashley, Bottineau, Cando, Carrington, Devils Lake, Garrison, Harvey, Lisbon, Mandan, Oakes, Rolla, Rugby and Williston.

Pharmacists providing telepharmacy services must be licensed as pharmacists where the patient is located. The pharmacy must be licensed in North Dakota, or in a contiguous state. Those with licenses from other states may be approved on a case by case pilot basis. Pharmacy technicians must be registered with the state board of pharmacy, have at least one year of work experience as a North Dakota-registered pharmacy technician; must have graduated from an American Society of Health Systems Pharmacists accredited pharmacy technician education program, and must demonstrate knowledge and experience in preparation of prescriptions for dispensing and working with patients. The pharmacist in charge is responsible for the policies and procedures, which include training of the pharmacy technicians.

Research in North Dakota so far has demonstrated that telepharmacy is as safe as other methods of medication delivery and, when compared to national data, safer (Peterson et. al., 2007). This research is ongoing.

In terms of additional state law or regulatory changes that could facilitate greater use of telepharmacy, the North Dakota Board of Pharmacy believes it has everything in place, but is willing to consider any suggestions for changes. In addition, the Board is beginning discussions with the Joint Commission and CMS to be sure their model is accepted.

The North Dakota Board of Pharmacy has not found the Joint Commission and CMS to be a barrier to telepharmacy use in hospitals so far. One issue on the horizon regarding the Joint Commission is the move to require that no nurses be allowed in the pharmacy. This rule may be especially problematic for CAHs due to limited pharmacy coverage when nurses often access medications in the pharmacy (e.g., nights, weekends, ER, etc.). It is an issue that needs to be monitored if CAHs and other small rural hospitals are going to continue to seek Joint Commission accreditation. Cross training of nurses as pharmacy technicians is one answer to this problem.

The NDSU College of Pharmacy, Nursing, and Allied Sciences has received a grant of \$805,399 through the Health Resources and Services Administration's Office of Health Information Technology to expand telepharmacy to additional hospitals in rural North Dakota. The Office for the Advancement of Telehealth will administer the grant, which will fund the establishment of a central order entry site (COE) in Fargo, ND and implementation of telepharmacy technology at nine small rural hospitals. The project is a joint venture of the College of Pharmacy, the North Dakota Board of Pharmacy, and Catholic Health Initiatives, which will own and operate the facility. The long term goal is for the COE site to provide 24/7 pharmacist staffing and services to any rural hospital in the state choosing to contract for these services. The COE site will provide supervisory pharmacist oversight to rural hospital pharmacies via telepharmacy technology, including audio, video, and computer links and scanned electronic images.

Heart of America Medical Center, Rugby, North Dakota

Heart of America Medical Center in Rugby, North Dakota, is a CAH that has a pharmacist on site approximately 45 hours per week. It currently has one pharmacist, is recruiting for another full-time pharmacist, and a pharmacy technician less than .25 FTE. It is part of a six hospital network that uses a Polycom interface with audio and video links at each hospital. A pharmacist also provides relief coverage from a link in her home.

Heart of America began implementing telepharmacy in August 2005. The motivation was need for pharmacist coverage. Rugby had two pharmacists and one could go, on occasion, for relief work at other hospitals if necessary. However, the pharmacists felt that the best solution to providing coverage for the hospital pharmacies was through telepharmacy.

Heart of America approached the hospitals in Devils Lake and Harvey followed by those in Cando, Rolla, and Carrington. They later connected with SSCI Hospital in Mandan. They work with various computer systems and security systems (e.g., firewalls and encryption). Two hospitals are part of corporate systems. The Polycom interface with all hospitals is easy. However, one management system is more problematic because it has a corporate IT person in Texas. The challenges are not viewed as insurmountable.

If CMS mandated that a pharmacist needs to review all orders before administration similar to current Joint Commission requirements, then the use of telepharmacy would increase. For example, it would be necessary to provide night pharmacist coverage; however, the cost may be prohibitive unless there was added reimbursement for this extra coverage. Heart of America is not Joint Commission accredited. It states that the Joint Commission requirements are the gold standard, but meeting the standards as a network is a problem when the hospitals are not Joint Commission accredited.

The hospitals obtained grant funding, with North Dakota State University (NDSU) as the lead, to cover initial setup costs for equipment. The hospitals bill each other for work; they contract for either a half-day or a full-day of pharmacist coverage.

Regarding liability or risk management issues related to the use of telepharmacy, the hospital followed the advice of their insurer regarding pharmacy coverage. They have not incurred any additional liability, but needed policies, procedures, and contracts in place. In addition, they needed to be business associates under HIPAA. All of these additional steps supported a very thorough and practical implementation of telepharmacy.

The hospitals follow continuous quality improvement strategies and monitor medication errors. NDSU is conducting an evaluation of telepharmacy. The telepharmacy pharmacists do not have an on-going role in medication safety activities at this time.

Heart of America is cautiously optimistic about the future for telepharmacy. Other hospital sites have indicated they need more pharmacist coverage, however, hospital CEOs have a difficult time dedicating funding to telepharmacy costs (e.g., the half or full-day coverage costs). It is an issue of practicality meeting expenses. They need to get people in the network to make a commitment of funds to make the system work.

The pharmacists feel that they have tackled the technology and the regulations, and demonstrated that telepharmacy can be done well, but they are not certain that they can afford it in the long term. When rural hospitals have few patients (e.g., an average census of seven patients at Heart of America), the issue of cost becomes the greatest barrier to telepharmacy.

Lisbon Area Health Services, Lisbon, North Dakota

Lisbon Area Health Services (LAHS) in Lisbon, North Dakota is a CAH that began implementing telepharmacy in 2006. LAHS has two pharmacists and a pharmacy

technician on staff. One pharmacist works approximately 20 to 25 hours per week at the hospital (and also works 20 to 25 hours a week at the Veteran's Home). The second pharmacist is a 74 year old retail pharmacist who serves as a backup for the hospital pharmacist when she is ill or on vacation; he works about one hour a week at the hospital. Both pharmacists provide consultation for the nursing home.

The hospital pharmacist serves as the central hub whether she is located at the hospital or at the Veteran's Home. She is linked to the pharmacy technician at the hospital and can also check the pharmacy technician at the retail pharmacy. The retail pharmacist's link is located at the retail pharmacy; he can also check the work of the pharmacy technicians at either the Veteran's Home or the hospital.

Their motivation for implementing telepharmacy was that the pharmacists needed to be in more than one place at one time. A third pharmacist used to work with them, but could not work full-time due to illness. In the long run without telepharmacy, they would have needed a third pharmacist. However, retail pharmacy would have been difficult to recruit for given the advent of Medicare Part D. The NDSU College of Pharmacy secured grant dollars for initial telepharmacy costs, receiving \$35,000 for the three sites in Lisbon (the hospital, Veteran's Home and retail pharmacy). The hospital is not Joint Commission accredited.

Pharmacists Mutual is the liability insurance company they used. The policy, acknowledges the provider's use of telepharmacy; however, there was no change in premiums or coverage. The company did not perceive telepharmacy to be an increased risk or liability. NDSU has contracted with a company to do medication error tracking. In addition, the hospital pharmacist always tracks medication errors and has observed no changes.

In terms of future plans for telepharmacy, the Lisbon providers have no plans at this time other than upgrading the technology and using scanners. They would like to see improved quality on the camera technical hook-up and need more band width as the screen is sometimes difficult to look at because it keeps refocusing. Scanning equipment would also help and eliminate the need to use actual documents with the camera.

Oklahoma

Oklahoma Board of Pharmacy

The Oklahoma Board of Pharmacy regulations do not specifically address telepharmacy. Decisions to allow the use of telepharmacy are made on a case by case basis. The organization that wants to use telepharmacy contacts the Board and submits information about the process they want to use; the Board reviews the information and makes a decision whether or not to approve the requestion.

In Oklahoma, many Critical Access Hospitals and other small hospitals have drug rooms rather than pharmacies and are governed by different rules. Most are not Joint

Commission accredited. Hospitals with drug rooms have a consultant pharmacist onsite at least once a week and can't do any outpatient dispensing out of the drug room. A nurse (LPN or RN) usually works in the drug room with the consultant pharmacist. Pharmacy technicians are only allowed in licensed pharmacies.

The Board considers requests, on a case by case basis, to allow a rural hospital to transmit medication orders electronically for review by a pharmacist at another hospital. It has allowed pharmacists to review medication orders from a remote location. The pharmacists must have access to all the information they need to make professional decisions, e.g., access to references on-line and a link to the hospital computer. Atoka Memorial Hospital and a consultant pharmacist providing pharmacist services via telepharmacy to the hospital, offered their procedure to the Board and the Board approved it.

Pharmacists reviewing orders electronically can be physically located in another state. The Board has not had any requests for pharmacists from another country to do remote order review, but wouldn't approve them. The Board had a request from Cardinal Health, a national company providing telepharmacy services, to use telepharmacy for relief pharmacists, but the Board wouldn't allow it for Emergency Department hours.

In terms of state law or regulatory changes that would allow hospitals to make greater use of telepharmacy, the only change the Board is looking at is legislation that would create another type of license for an entity that has pharmacists providing medication management therapy, but not dispensing medications.

Atoka Memorial Hospital, Atoka, Oklahoma

Atoka Memorial Hospital is a 25 bed Critical Access Hospital. Atoka began using MDG Medical Inc.'s ServeRx medication dispensing system in 2005. In 2006, the Oklahoma Board of Pharmacy approved a request from Paul Moore, the consultant pharmacist for Atoka, to use a group of pharmacists to electronically review medication orders from rural hospitals, including Atoka. Written medication orders are scanned and sent electronically for review by the remote pharmacist, who checks for medication appropriateness, allergies, and potential drug interactions. After approval by the remote pharmacist, the medication is deployed to a medication pass cart that is part of the ServeRx system at the hospital. At the appropriate time, a nurse separates the cart from the system and takes it to the patient's bedside for medication administration.

Atoka Hospital contracts for remote pharmacist review for an hourly charge. Orders are reviewed prospectively for 6 hours a day, from 9 AM to 3 PM, and retrospectively for the other 18 hours, achieving 100% review within 24 hours.

Measures being tracked for the pharmacy services each month include: 1) the number of hours a pharmacist is on duty; 2) the number of orders reviewed; 2) the number of pharmacist interventions and clarifications; and 3) the most frequent type of interventions and clarifications, including medication errors, order clarifications, therapeutic change recommendations, and dosing issues. Prior to using the ServeRx

technology, Atoka Hospital assumed that it had very few medication errors, but found that many errors were going undetected. For the first few months after implementation of remote review, the medication error rate initially increased, as more errors were identified using the new process, but the error rate has decreased dramatically since then.

South Dakota

South Dakota State Board of Pharmacy

South Dakota is in the process of adopting regulations to address telepharmacy. A public hearing to consider the adoption of the proposed telepharmacy rules was held on June 5, 2008. The rules being amended are South Dakota Administrative Rules 20:51:15:01; 20:51:15:18 to 20, and 20:51:30. The Board of Pharmacy's goal is to have the new rules in place by September 2008.

The proposed rules will establish criteria to permit a licensed South Dakota hospital pharmacy with 24-hour services to provide limited or part-time pharmacy services to small hospitals and the use of Board of Pharmacy registered technicians to operate a retail telepharmacy when connected to a licensed South Dakota central pharmacy using advanced technology, automation and design.

Much of this is the regulatory oversight catching up with emerging telepharmacy practices since telepharmacy is already in place in several South Dakota hospitals. The Board is "legitimizing" telepharmacy and setting standards where the practice is occurring. The executive secretary of the Board suggests that enacting guidelines after the fact helps regulators who have the advantage of knowing what is working and what isn't.

The regulations will cover:

- After hours first order review with no automated dispensing devices where a nurse obtains medication from a pharmacy or medication room
- Having a rural hospital fax medication orders for review by a pharmacist at another hospital, with a nurse subsequently obtaining medications from the pharmacy or medication room
- Having a rural hospital transmit medication orders electronically for review by a pharmacist at another hospital with a nurse obtaining medications from the pharmacy or medication room
- Having a pharmacist at another site remotely control access to medications at a rural hospital using medication dispensing equipment
- Having a pharmacist provide long-distance supervision of pharmacy technicians at a rural hospital

Telepharmacy will be regulated differently in hospitals and ambulatory (clinic or retail) settings. Ambulatory settings will have very specific requirements for an audiovisual (A/V) link. If the A/V link is interrupted, the pharmacy technician will be required to

cease work. In a hospital setting, if a registered nurse obtains medications after hours, a camera video will not be required.

In South Dakota, there will be restrictions on the physical location of pharmacists providing telepharmacy services. Telepharmacy will be permitted if a hospital is part of a network and is in an adjoining state, but the pharmacist must be located in a licensed pharmacy. (Pharmacists will be allowed to provide after-hours coverage from home, but will not be allowed to operate a free-lance business unless they have a permit to operate a pharmacy. The purpose of this requirement is to ensure that inspectors have the right to inspect the site of practice and ensure that the pharmacist has access to required reference materials.)

In the retail setting, telepharmacy will be required to be provided by another pharmacy in South Dakota. Regardless of whether telepharmacy is used as a full time system to provide pharmacy services in a hospital or only used to provide after hours coverage, it will be required that a pharmacist be available at least once per week to supervise. A pharmacy will not be allowed to only be covered remotely. Pharmacists providing telepharmacy services will be required to be licensed as pharmacists in South Dakota.

Proposed regulations will affect distances between delivery and recipient pharmacies. The board will impose a twenty mile limit for a retail pharmacy providing telepharmacy services. This is intended to protect the territory of smaller retail pharmacies. Hospitals will be required to submit their policies and procedures regarding telepharmacy under various scenarios. For example, does the hospital have specific procedures regarding dispensing equipment? Will personnel fill new orders after hours in lieu of dispensing equipment?

Representatives of the state health department are participating on committees developing telepharmacy rules and regulations. CMS' Conditions of Participation for hospitals in the use of telepharmacy (first order review and safety procedures) are being incorporated in the telepharmacy regulations. The executive secretary of the Board of Pharmacy does not feel that any changes in federal regulations are necessary to improve use of telepharmacy. Joint Commission standards affect telepharmacy indirectly in South Dakota. None of the recipient hospitals in South Dakota are Joint Commission accredited so the standards only apply to hospitals that deliver telepharmacy services.

Currently, South Dakota requires registration of pharmacy technicians but not certification. With the proposed telepharmacy rules, if a technician is working at a remote site, the board will require certification.

Lead-Deadwood Regional Hospital, Deadwood, Rapid City Regional Hospital, Rapid City, and Spearfish Regional Hospital, Spearfish, South Dakota

Lead-Deadwood Regional Hospital is an 18-bed Critical Access Hospital in Deadwood, South Dakota that has been in existence for 111 years. It receives telepharmacy services from Rapid City Regional Hospital, a 366 bed facility in Rapid City and from

Spearfish Regional Hospital, a 40 bed hospital in Spearfish. Lead-Deadwood's pharmacy is staffed by a 0.6 FTE pharmacist and a 1.0 FTE pharmacy technician. Coverage is about 24 hours/week depending on the hospital's census. During high tourist periods, coverage is increased.

All three hospitals are members of the Regional Health System, an integrated health care network. Lead-Deadwood is in the Regional Health System but in a different corporation from Rapid City. This corporation, called the Regional Health Network, operates several long term care, assisted living and four acute care hospitals, three of which are CAHs. Lead-Deadwood was purchased in the mid-1990s by Rapid City Regional Hospital. Rapid City pharmacists, travelling 45 miles over mountain roads, staffed Lead-Deadwood's pharmacy. In 2002, Rapid City Regional Hospital purchased or leased a number of smaller rural CAHs, installed a common computer platform, and started using a computer generated medication administration record (MAR) with input from Rapid City's pharmacy staff. Medications were purchased through a group Premier contract through the parent hospital. Lead-Deadwood began using pharmacy staff from Spearfish Regional Hospital but found the situation untenable as Lead-Deadwood was often dependent on Spearfish's priorities. Lead-Deadwood then hired a 0.6 FTE pharmacist, a situation that has worked out well. Telepharmacy is primarily used for after hours. Lead-Deadwood could never afford to provide the level of pharmacy services as a standalone facility that being part of a telepharmacy hospital network allows it to have.

Lead-Deadwood has a Pyxis machine linked via computer to Rapid City and to Spearfish. During off hours Lead-Deadwood faxes physicians' orders to either Rapid City or Spearfish. This generates a MAR and an order is transmitted to a Pyxis machine in either Lead-Deadwood's medical-surgical unit or emergency department. A larger number of override medications are available to nurses in the emergency department. In the ER, input of patient data is often completed retrospectively. In non-emergent situations, medications are assigned to a patient. If a patient is admitted when a pharmacist is not on duty, the offsite pharmacist enters the data into the Pyxis system so that a MAR is generated and appropriate medication orders generated. Only a registered nurse has access to the Pyxis machine. The pharmacy technician is responsible for filling up the Pyxis unit drawers and entering charges. The largest barrier to using their current model of telepharmacy is the cost of leasing the Pyxis equipment. If the equipment needs to be upgraded or purchased, it would provide a major financial challenge to the hospital.

Lead-Deadwood's CEO likes the North Dakota retail telepharmacy model, in which certified pharmacy technicians use A/V equipment to broadcast an order and an image of a medication to a site with a pharmacist, who validates that it is the correct medication and dosage, and approves it to be dispensed. Lead-Deadwood feels that its Pyxis system is adequate, but it requires connection to a computer network. For independent hospitals, Lead-Deadwood argues that the North Dakota model should be more widely adopted, but recognizes that the cost of A/V equipment is high and a larger pool of certified pharmacy technicians would be needed for this model to work.

The Pyxis system has some drawbacks in that it can not accommodate all of the medications necessary for all clinical situations. A system of having medications targeted to the severity of the conditions of the patient population may reduce the need for an override system. In Rapid City, a system is being tested where all medications are bar-coded and entered into the automated MAR. Security to ensure that the medication put before the camera is the same as that which will ultimately be dispensed is still needed.

Lead-Deadwood is not Joint Commission accredited. Medicare reimbursement policies and Medicaid or 3rd party payer policies have not affected the hospital's use of telepharmacy. Liability and risk management issues related to telepharmacy are handled at the corporate level.

Lead-Deadwood funded telepharmacy by capitalizing four Pyxis machines with the understanding that they would eventually be purchased. However, the situation changed and Rapid City began expensing the rental fees. The fees caught Lead-Deadwood short for a period of time but the hospital managed to make it work financially. The pharmacist initially had to put in more time and there was some staff training expense. No grants were employed for telepharmacy funding.

One measure of outcomes of telepharmacy is the productivity of pharmacy staff. The CEO reports that some of the hospital's pharmacy technician's hours, normally devoted to the pharmacy, will be devoted to supporting the medical surgical team because of efficiencies in the pharmacy. Telepharmacy has had an impact on medication safety. The hospital IT system produces descriptive pharmacy reports based on patient, medication and time frames. A medication error rate of less than one percent was recently reported. There has been no evaluation of hospital data comparing medication errors before and after the implementation of the telepharmacy system.

The CEO would like to expand automated drug dispensing to other areas of the hospital but reports that this is not currently financially feasible. She credits the automated MAR and remotely controlled medication dispensing equipment with keeping her small staff efficient and productive.

Texas

Texas State Board of Pharmacy

In Texas, large hospitals (more than 100 beds) must have a pharmacist on duty at all times the pharmacy is open for pharmacy services, while small hospitals (100 beds or less) may have part-time services where a pharmacist must visit the facility at least every 7 days. All hospital pharmacies must be licensed in Texas.

Texas law provides for the provision of telepharmacy in rural health clinics regulated under 42 USC Section 1395x(aa), health centers defined by 42 USC Section 254b, or healthcare facilities in medically underserved areas. Currently, the Board has approved

four telepharmacies. (Remote pharmacy services using telepharmacy systems, Texas Administrative Code, Title 22, Part 15, Section 291.121(c)). State law provides for a suspension of regulations in order to conduct pilot projects involving telepharmacy in hospitals. Having a pharmacist provide long-distance supervision of pharmacy technicians at a rural hospital has not been allowed, except through a pilot project such as the project described below with Envision Telepharmacy.

The Texas State Board of Pharmacy has the authority to make modifications to rules to permit the use of telepharmacy by hospitals without needing input from the State Legislature. The Board recently drafted proposed amendments to the Texas Administrative Code, Title 22, Part 15, Sections 291.72 and 291.73 regarding institutional pharmacies that would permit a hospital (urban or rural) with fewer than 100 beds to have a pharmacist provide remote supervision of pharmacy technicians working in a hospital pharmacy, similar to the Envision Telepharmacy pilot project. The proposed amendments would allow electronic supervision of pharmacy technicians or pharmacy technician trainees to be considered the equivalent of direct supervision, provided that the pharmacy uses a system that monitors data entry and filling of medication orders electronically. This monitoring is to be done using: 1) digital interactive video, audio, or data transmission; 2) data transmission using computer imaging by way of still-image capture and store and forward; and/or 3) other technology that facilitates access to pharmacy services. Additional requirements include that the pharmacy establish controls to protect the privacy and security of confidential records; the pharmacist responsible for the duties performed by the pharmacy technician verifies the data entry and the accuracy of the filled orders prior to release of the orders; and the pharmacy keeps permanent digital records of duties electronically supervised and data transmissions associated with electronically supervised duties for a period of two years.

The proposed amendments were published in the *Texas Register* on June 20, 2008 for public comment. Board review of the public comments was scheduled for August 2008. If no major issues arise, the Board will publish the amendments in the *Texas Register* for final adoption after a 20 day period from the date of submission, with an approximate effective date in September 2008.

Telepharmacy Pilot Project with Envision Telepharmacy

Envision Telepharmacy, based in Alpine, Texas, has provided telepharmacy services to rural and urban Texas hospitals since 2004. Envision provides:

- remote order review and entry
- after hours medication provision
- electronic supervision of pharmacy technicians
- after-hours clinical pharmacy services for drug information or consultations

Based on positive results from data collected in a pilot hospital in 2005, the Texas State Board of Pharmacy approved an expansion of the pilot project to four hospitals in 2006. Eligibility requirements for the pilot included a size restriction of 100 beds or less and no pharmacist on site. The hospitals participating in the pilot project ranged in size from 4 to 40 beds; hours per week of pharmacy coverage range from 4 to 58; and staffing

varied from full time pharmacists who need after-hours assistance to hospitals with consulting pharmacists who work limited hours per week.

In some of the pilot project hospitals, Envision provides pharmacy technicians who perform the following functions: 1) medication and drug distribution entry; 2) access and stock automated dispensing equipment; 3) unit and multiple dose pre-package; 4) compound sterile products; 5) distribute to stock supply areas; 6) work pursuant to medication orders; 7) identification of patient's own medications; 8) verification of records; and 9) bulk compound or batch prepare.

It was difficult to recruit hospitals into the Envision telepharmacy pilot. Many hospitals had been operating in violation of state board of pharmacy regulations, but were not being cited. For some hospitals, it was a case of not wanting to solve a problem until it became one. Hospitals participated in the pilot for several reasons, including lack of pharmacists and need for staffing, and to provide weekend and after-hours coverage. One hospital participated when one of their two pharmacists became ill and the other had worked 120 consecutive days. The pilot was completed in December 2007 (Envision, 2008).

State, not federal, regulations limit the use of telepharmacy in Texas. As noted above, the State Board of Pharmacy has drafted a set of telepharmacy rules and regulations for hospitals with fewer than 100 beds based on the results of the pilot project. After a period of review and commentary, the new regulations are expected to go into effect by September 2008. Competing interests may come into play and provide barriers to telepharmacy implementation. Because of competition with commercial pharmacies, current rules governing outpatient pharmacies are very restrictive. With the new regulations regarding inpatient pharmacies, conflicts may arise between telepharmacy and consulting pharmacists who visit a hospital a few hours or days weekly.

Because of Texas regulations, Envision does not provide outpatient services from the hospitals they service. Texas rules prohibit inpatient pharmacies from dispensing outpatient medications unless they have an outpatient pharmacy license. Current regulations stipulate that in community pharmacies, remote supervision is a form of direct supervision. If this regulation carries over to the new regulations for hospital pharmacies, it will be a boon for telepharmacy.

Some hospitals in the pilot project are Joint Commission accredited. The Joint Commission is moving in the direction of supporting telepharmacy in hospitals with pharmacy technicians but not in those with nurses only. If a hospital pharmacy is open during telepharmacy hours, Joint Commission standards are met through the use of the telepharmacy system. However, if a hospital pharmacy is closed during telepharmacy hours, the standards are not met. Envision feels that if full services are provided through telepharmacy, the pharmacy should be considered open.

Envision Telepharmacy is a commercial operation. All funding for the pilot came from hospitals paying Envision's fees which, according to Envision, are affordable for small

rural hospitals. No grants were used to fund the pilot, with hospitals paying Envision's fees out of their general operating budgets.

Current Texas regulations require a pharmacist to be on site at the hospital at least once every seven days. Since telepharmacy pharmacists supervise on a daily basis, Envision believes that the proposed rules will take this into consideration. According to Envision, if a pharmacist is not required to be on site at least every seven days, the costs savings from that alone will pay for telepharmacy in some hospitals.

The telepharmacy pilot recorded all interactions between supervising pharmacists and pharmacy technicians and tagged them with a job number. The interactions can be examined retrospectively, identifying the task, who was involved, examining the annotated dialogue, and when any element of the interaction occurred.

No liability or risk management issues occurred in the pilot. Under existing state regulations, the recipient hospital's pharmacist in charge is responsible for all medication use when using telepharmacy.

Pharmacists at the pilot hospitals have complete access to Envision's records. Since hospitals are paying for the telepharmacy pilot, some have conducted evaluations. The final report from the pilot study, according to Envision, demonstrates both qualitatively and quantitatively the impact of telepharmacy on medication safety. The evaluation data included measures of medication orders supervised by a remote pharmacist; pharmacist interventions involving patient safety and regulatory or accreditation issues; and automated medication supply system overrides. All hospitals involved in the pilot plan on continuing Envision's services.

Tying down the location of the pharmacist is the biggest impediment to telepharmacy, according to Envision's representative. If one is required to be in a particular state, or working out of a pharmacy or call center, telepharmacy's growth will be limited. She makes the point that state boards have complete jurisdiction over pharmacist licensing, and pharmacists should be licensed in the state where they are delivering services, so the physical location of the pharmacist shouldn't matter as long as security is maintained.

Utah

Utah State Board of Pharmacy

Utah state law defines telepharmacy as "the practice of pharmacy through the use of telecommunications and information technologies." The Utah Pharmacy Practice Act (58-17b-612(1)(b)) stipulates that a supervising pharmacist need not be in the same location as a pharmacy technician if the pharmacy is in a hospital or a clinic located in a "remote rural county" and the pharmacist is available via a telepharmacy system for immediate contact. A remote rural county is defined as having less than 20 people per square mile. State rules include provisions regarding a live A/V feed so that a pharmacist can observe what a pharmacy technician is doing, but no stipulations exist

about specific activities that are not allowed. Technicians can function as if they were in the same location as the pharmacist. Telepharmacy is regulated the same in hospitals and ambulatory settings.

Utah state laws and regulations would allow a rural hospital to fax medication orders or transmit them electronically for review by a pharmacist at another hospital. They would also allow a pharmacist at another site to remotely control access to medications at a rural hospital using medication dispensing equipment, and would allow a pharmacist to provide long-distance supervision of pharmacy technicians at a rural hospital.

Pharmacists can provide telepharmacy services from another state as long as they are licensed in Utah. The regulations forbid use of pharmacists from another country. The pharmacist can be at any location including his/her home as long as they have a real time A/V connection. The telepharmacy regulations do not differ between use as a full time system to provide pharmacy services to a hospital or only to provide after hours coverage.

Hospitals in Utah do not need special permission or waivers from the Board of Pharmacy to implement telepharmacy activities, as long as they abide by the rules and regulations of the Pharmacy Practice Act. There are no restrictions on the distance between delivering and receiving institutions or on the use of commercial pharmacies. In summary, hospitals receiving telepharmacy services can function as normal pharmacies except that they do not have a pharmacist onsite. No new regulations or policies are pending in Utah.

Allen Memorial Hospital, Moab; San Juan Hospital, Monticello; and the University of Utah

A pharmacist who is an employee of the 438 bed University of Utah Hospital works at Allen Memorial Hospital three days a week and at San Juan Hospital the remaining two days. Allen Memorial Hospital has a licensed pharmacy. A pharmacist is on site 24 hours a week, a pharmacy technician 40 hours a week and there is no after hours or weekend coverage. After-hours questions are referred to the pharmacist, who travels between Allen Memorial and San Juan Hospital. Allen Memorial Hospital is 55 miles north of San Juan Hospital. Both are Critical Access Hospitals, but Allen Memorial has many more patients than San Juan.

Initially, four Utah sites participated in telepharmacy: Allen Memorial Hospital, San Juan Hospital, Monument Valley clinic and Montezuma Creek clinic. Both Monument Valley and Montezuma Creek are clinics on the Navajo reservation. The telepharmacy program, including Pyxis cabinetry and A/V equipment, was created by a commercial pharmacist approximately seven years ago. This individual attempted to manage the program out of his home in Las Vegas, Nevada. The Utah Board of Pharmacy expected him to also personally visit the facilities he was supervising, which he did not, and he was forced to resign.

Subsequently, the University of Utah received a federal telemedicine grant to continue the program. A Utah State Board of Pharmacy member who was also a University of

Utah faculty member was the grantee. Both Navajo clinics subsequently dropped out of the program. Since the small telepharmacy system already existed at Allen Memorial and San Juan, the University of Utah program began with them.

The telepharmacy program at the University of Utah does not provide 24 hour coverage to Allen Memorial and San Juan. The telepharmacy program and a home infusion program were moved to a remote location away from the main pharmacy, and they are only open during normal business hours. When the pharmacist is unavailable during normal business hours, the pharmacy technician faxes orders, refill sheets and MARs to the University and refills are authorized on the Pyxis system. However, there is no after-hours coverage. The lack of after-hours coverage means that orders do not get reviewed on a daily basis, e.g., a Friday night order might not get reviewed until Monday. Thus, telepharmacy in this case refers to a remote pharmacist providing coverage and supervision during normal business hours but not providing remote off-site coverage during after-hour periods. The latter possibility has been investigated outside of the contract with the University of Utah and it is still under consideration.

Placing A/V equipment back in the main University of Utah pharmacy was discussed at a recent meeting at the University. However, because of Joint Commission regulations, there would be an additional \$50,000 cost to purchase Pyxis Connect for the Allen Memorial pharmacy, nursing station and University pharmacy so that medication orders can be reviewed and authorized for a patient after-hours. Allen Memorial does not have the budget to cover this cost so the proposal was tabled.

Allen Memorial is building a new hospital and the cost of leasing new Pyxis cabinetry is in the capital budget. The maintenance agreement on the existing cabinets expires in the summer of 2008 and the machines will need to be replaced. With the building of a new facility, there may be a new contract between the University of Utah and Allen Memorial. This contract will include salary and benefits cost increases that will be difficult for Allen Memorial to cover. Allen Memorial will employ a full-time pharmacist at the new hospital if not before.

San Juan Hospital has purchased new Pyxis systems, based on the results of a pre-post study showing that the Pyxis stations have been responsible for billable pharmacy revenues of \$600,000-800,000/year. The University of Utah has asked the pharmacist who covers Allen Memorial and San Juan to fill out monthly forms estimating how much money patients save by not having to drive to a pharmacy in another town.

The pharmacist who works at Allen Memorial and San Juan was asked to develop policies and procedures for telepharmacy when he was hired. These policies and procedures were never incorporated into state statutes, so the telepharmacy program is governed by an agreement between the State Board of Pharmacy and the University of Utah. There has been no growth in the University of Utah telepharmacy program in the last five years. The pharmacist believes that getting telepharmacy statutes in place would allow greater use of telepharmacy in Utah.

Washington

Washington State Board of Pharmacy

Washington State does not currently have regulations that specifically address telepharmacy. The Board of Pharmacy is currently using existing rules related to: 1) electronic transmission of prescriptions and 2) automated drug release. Telepharmacy projects are approved as needed through the Board. It allows pharmacy technicians to be supervised electronically through video-real time.

The Board allows faxing or transmission of medication orders electronically for review by a pharmacist, with dispensing by a pharmacy technician using video as a check for the medications and pharmacist counseling for the patient. They also allow having a pharmacist at another site remotely control access to medications at a rural hospital using medication dispensing equipment, and having a pharmacist provide long-distance supervision of pharmacy technicians at a rural hospital.

Pharmacists providing telepharmacy services must be licensed in the State of Washington. In terms of quality or safety concerns regarding the use of telepharmacy in hospitals, the Board had one issue, which was a personnel problem. The telepharmacy participants routinely address quality issues.

Training requirements have been modified for pharmacy technicians. A three month training program provides a credential upon successful completion. Some pharmacy technicians also participate in a full-year course.

Every telepharmacy project works closely with the State Health Department investigator/surveyor regarding CMS' Conditions of Participation for hospitals. The Board has a department of pharmacy investigators as part of the state's CMS survey team. The Board of Pharmacy thinks that state regulations regarding telepharmacy are needed. They also think that more help is needed from CMS, because they have difficulty ensuring that a pharmacist reviews orders before medication is administered to patients.

There is a mix of Joint Commission accredited and non-accredited hospitals in Washington, so the standards that apply to hospital pharmacy vary between Joint Commission and CMS survey requirements.

Sacred Heart Medical Center and 12 rural hospitals, including Coulee Community Hospital, Grand Coulee, Washington

Sacred Heart Medical Center, a 623 bed tertiary care hospital in Spokane, has 5 to 6 inpatient pharmacists who provide pharmacist coverage onsite at the hospital 24 hours a day, 7 days a week. In conjunction with Inland Northwest Health Services' Northwest TeleHealth Network, Sacred Heart has implemented a telepharmacy service that connects 12 hospitals, including Critical Access Hospitals and medium sized hospitals ranging in size from ten beds to 300 beds, to the hospital pharmacy. Half of the participating hospitals are part of the Providence Health System.

Sacred Heart has individual agreements regarding each hospital's pharmacy needs. For example, some hospitals do remote restocking of medications whereas others have Sacred Heart oversee the re-stocking. Four different databases are used because some hospitals run on different platforms. MediTech and Pyxis Connect are used for telepharmacy. Pyxis Connect requires a phone link for accepting information. They are able to link images to a MediTech account number and create an archive. An image is scanned using the handwritten medication administration record (MAR) or the electronic MAR is sent. They provide on-line clinical interventions when available, although they don't always have access to the patient's history and lab results. One challenge is working with different Standard Industrial Classification (SIC) codes. They also need to standardize the process for establishing the continuity of pharmacy inventories, using the same formularies, to cut down on order entry problems.

Sacred Heart began implementing telepharmacy in 2000. The motivation was the availability of pharmacists and the cost of maintaining 24/7 coverage as hospitals in the middle part of the state had experienced pharmacist losses. It was also an issue of cost effectiveness. In Washington, a fulltime pharmacist is paid about \$125-130K per year. In order to have 24/7 pharmacy coverage, it would require a minimum of 4.2 FTEs which translates to over \$500K per year. In addition, retail pharmacists do not know institutional pharmacy practice.

The telepharmacy project started with a federal technology grant for \$2 million in 2000-2001. They had grant funding through 2006 to provide equipment to remote facilities; however, the facilities must pay for Pyxis equipment. The facilities also received grants through state funding and some facilities also secured federal funds.

The state is in limbo regarding regulation of telepharmacy practice in hospitals. The Sacred Heart telepharmacy program had a one time dispensation to run the program, which is now almost 7 years old and state regulations have not been formulated. The issue of where orders can be processed needs to be defined. For example, some pharmacists have worked reviewing orders at their homes using secured network dialing into remote areas. Although the pharmacists were not technically located at a pharmacy, they were working virtually in a secured network at Sacred Heart. The remote model works well, but it needs to be tightly regulated. The remote sites also help in recruitment efforts of pharmacists.

The Washington Board of Pharmacy inspectors review 24/7 access to pharmacy services. Sacred Heart finds the inspectors useful because they see differences in practice sites and can provide useful improvement tips. In addition, the inspectors were institutional pharmacists and understand institutional pharmacy issues.

Half of the hospitals in the telepharmacy program are Joint Commission accredited (all Providence hospitals must be accredited). Pharmacists at Sacred Heart are covered under the Sacred Heart liability umbrella. All facilities involved in telepharmacy conduct medication error reporting. Each facility gives and receives feedback. In terms of the impact on medication safety, Sacred Heart has helped individual hospitals depending

upon the need. There are some safety issues that they have helped to address. There is a dedicated telepharmacy manager at Sacred Heart who also has some inpatient responsibilities.

One of the rural hospitals that receive telepharmacy services from Sacred Heart is Coulee Community Hospital (CCH) in Grand Coulee, Washington. CCH began implementing telepharmacy in 2006. Coulee has a contract with Inland Northwest Health Services (INHS) for information technology services. INHS approached Coulee about the telepharmacy opportunity with Sacred Heart.

CCH is a 25 bed critical access hospital with a medication room and one part-time pharmacist. The pharmacist is on site at the hospital 6.5 hours per week of a 20 hour per week contract, with the remaining time by phone. The hospital has two pharmacy technicians. One, who is also a registered nurse, is the telepharmacy coordinator and works 40 hours per week. The second pharmacy technician works one to two hours a day at the hospital and the rest of the time at a retail pharmacy.

The part-time pharmacy technician at CCH does the base fills of the Pyxis. The full-time pharmacy technician/RN double checks the fills, and then calls Sacred Heart to have the pharmacy technician there triple check, using a camera and verifying the medication verbally.

CCH received a federal grant for the technology components of telepharmacy. The hospital rents a Pyxis cabinet, and would like to have a second Pyxis for the emergency department. The triple checks instituted as part of the telepharmacy program have improved medication safety at the hospital. CCH would like to continue its telepharmacy activities, and have assistance from the Sacred Heart pharmacists to provide double checks on unit dose pack fills and with dosing questions.

V. DISCUSSION AND CONCLUSIONS

A number of different rural hospital telepharmacy models are being implemented around the country. The models being implemented appear to be a function of a variety of factors, including the state policy and regulatory environment, as well as rural hospitals' ownership and network relationships with other hospitals, the type of rural area (e.g., isolated rural or frontier versus more densely populated areas), the distance between hospitals, hospital size, and the volume of medication orders being handled.

A common telepharmacy model involves sharing of pharmacist services among hospitals in the same health care system. Several examples of this model were identified in our interviews, including those involving system hospitals in Arkansas, Idaho, Montana and South Dakota. Usually, this model involves having a larger hospital with 24/7 pharmacist staffing review medication orders sent electronically or via fax from one or more smaller rural hospitals in the same system. The use of telepharmacy is often facilitated by a history of shared services and the same or similar computer systems among hospitals with the same system ownership or contract management

relationship. Some Boards of Pharmacy also appear to be more comfortable approving telepharmacy arrangements within a health care system.

Other telepharmacy models involve a combination of system and non-system hospitals, such as in Washington State, where the telepharmacy network includes Providence Health System and non-system hospitals, or a network of hospitals that have joined together to share telepharmacy and other services. Some rural hospitals are contracting for telepharmacy services with a commercial telepharmacy company, either a small “home-grown” company or larger regional or national firms. In North Dakota, several small rural hospitals are contracting with each other for telepharmacy services, and two pharmacists who serve a rural hospital, VA center, and a retail pharmacy in the same community are connected at all three sites.

About half of the hospitals reported using grants for their initial telepharmacy set-up expenses, including federal grants from the Agency for Healthcare Research and Quality and HRSA Office for the Advancement of Telehealth, as well as State Office of Rural Health and private foundation funds. Additional expenses for these hospitals came from their operating budgets; the other hospitals funded their entire telepharmacy efforts through their own operating budgets. Some Critical Access Hospitals reported that Medicare cost-based reimbursement is helping them pay for telepharmacy. However, other hospitals indicated that lack of funding was a barrier to purchasing updated medication dispensing equipment.

In terms of evaluating the impact of telepharmacy on medication safety, the vast majority of hospitals reported that they track medication error rates internally. Some hospitals indicated that they have seen improvements in their medication error rates since implementing telepharmacy activities. In addition to medication error rates, other measures being tracked by some hospitals include: accuracy of order entry, turnaround time on order entry, number of after-hours orders, follow-up on after hours orders, overrides of automatic dispensing machines, productivity of pharmacy and nursing staff, and increases in billable revenues. Two multi-hospital telepharmacy projects reported that formal evaluations were conducted in partnership with universities: the North Dakota hospitals with North Dakota State University and the northeastern Minnesota hospitals with the University of Minnesota - Duluth. Envision Telepharmacy conducted an evaluation of its telepharmacy pilot project for a report to the Texas Board of Pharmacy.

Several themes emerged from our interviews with hospitals and state boards of pharmacy and reviews of state laws and regulations. First, while we were able to identify examples of rural hospitals that were implementing telepharmacy initiatives in several states, the use of telepharmacy technology to provide pharmacist services to rural hospitals is not widespread. Second, although telepharmacy is of considerable interest nationally and in some states, the majority of states have not yet adopted regulations that define the circumstances under which telepharmacy activities are allowed in hospitals. Many of the hospital telepharmacy efforts that are underway are pilot projects or are operating under temporary waivers of state regulations. In a number of states, the primary focus of telepharmacy regulation has been on retail settings. This focus appears to be motivated in part by a greater concern among Boards of Pharmacy about potential safety problems in retail settings as well as a desire to ensure the

availability of local pharmacy services and protect the market share of local retail pharmacies.

The study interviewees reported that federal regulations were not a barrier to telepharmacy implementation in rural hospitals. Joint Commission standards were a major motivation for some accredited facilities to use telepharmacy for after-hours medication order review, but were not a factor for the small rural hospitals that are not accredited. In a few states, some hospitals appear to be implementing telepharmacy activities without state regulatory approval, either because of the absence of state regulations or confusion about processes for obtaining approval. Several hospital respondents suggested that the adoption of state regulations defining allowable telepharmacy activities could encourage the implementation of telepharmacy in additional rural hospitals.

Among the states in our study, North Dakota has been the most active in addressing telepharmacy regulatory issues. State laws and regulations define a special licensure sub-class for telepharmacies in North Dakota, and the North Dakota Board of Pharmacy and North Dakota State University have been very involved in efforts to implement and evaluate telepharmacy in retail and hospital pharmacy settings. Montana laws and regulations also specifically address telepharmacy, allowing hospitals to register with the State Board of Pharmacy as telepharmacy sites. South Dakota is in the process of adopting regulations that will establish criteria for the use of telepharmacy in hospitals and retail pharmacies. The remaining states allow telepharmacy activities in certain situations, which are usually determined by Boards of Pharmacy on a case by case basis. Several states, including Arkansas, Minnesota, and Oklahoma, allow telepharmacy activities by granting variances or waivers of specific State Board of Pharmacy regulations. Other states, including Idaho, Texas, Utah and Washington, have allowed telepharmacy pilot projects with permission from the State Board of Pharmacy. South Dakota and Texas were in the process of considering enacting permanent telepharmacy regulations at the time of the study. Wisconsin and Illinois also recently passed telepharmacy legislation.

The interviewed State Board of Pharmacy representatives generally agreed that pharmacists providing telepharmacy services should be licensed in the state where they are providing the service, but differed on whether pharmacists should be required to be physically located in a licensed pharmacy in the state or could provide services from their homes or another location. They also had different perspectives on the minimum amount of time a pharmacist should be required to be on-site in a hospital receiving telepharmacy services, and the appropriate role for pharmacy technicians. The telepharmacy models currently being implemented in hospitals in Montana, North Dakota, Texas and Utah incorporate long-distance supervision of pharmacy technicians by pharmacists. Models being implemented in hospitals in other states, such as Arkansas and Idaho, rely on nurses obtaining medications from medication dispensing equipment.

Rural hospitals are increasingly motivated to improve medication safety, but face growing competition for a limited supply of pharmacists interested in practicing in smaller rural communities. At the same time, pharmacy technology is becoming more

widely available and affordable. These factors suggest that interest in implementing telepharmacy activities in rural hospitals is likely to grow in the near future, and State Boards of Pharmacy will face increasing pressure to address telepharmacy regulatory issues in both hospitals and retail locations.

Discussions about telepharmacy regulation are occurring in the context of a broader national debate about the pharmacy work force implications of changes in the practice of pharmacy. These changes include rapid growth in the volume of medications dispensed, the expansion of pharmacists' medication management responsibilities and overall workloads, and the evolution of pharmacy automation technology (Manasse and Speedie, 2007). As they consider the adoption of telepharmacy regulations, State Boards will need to address a number of policy issues, including the physical location of pharmacists providing telepharmacy services; the types of technology to be used; the minimum amount of time a pharmacist must be on-site at a hospital; and the roles of pharmacists, pharmacy technicians and nurses in medication distribution systems. State regulations that allow rural hospitals to make appropriate use of pharmacy technology are needed if telepharmacy is to realize its potential for increasing access to pharmacist expertise in rural hospitals and helping to achieve the overall goal of improving medication safety.

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