TELEPHARMACY

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ABSTRACT

Telpharmacy is the use of telecommunications technology to provide pharmacist services to distant populations. Telepharmacy services may includes drug review, provision of drug information, medication dispensing, verification of oral and sterile compounding, patient assessment, patient counselling and medication therapy management. The implementation of telepharmacy system is rapidly expanding due to the increasing affordability of videoconferencing technology and the increasing capacity of the pharmacist to securely assist electronic patient health records and perform traditional pharmacy practice activities remotely by the internet. The research on telepharmacy services reveals that patients are generally satisfied with the telepharmacy care they receives. Nurses and other healthcare professionals are also more satisfied with the after hour pharmacy services they receive by telepharmacy than before the telephartmacy system was implemented. Telepharmacy services have generally been shown to improve medication-related patient safely at remote hospitals. Patient clinical outcome have been shown improvement following the implementation of telepharmacy services. Recommendations for more stringent studies of telepharmacy services are provided.

KEYWORDS: Telepharmacy; telemedicine; pharmacy; pharmacies; pharmacistsmedication therapy management; drug information services.

1. INTRODUCTION

Telepharmacy is the delivery of pharmaceutical care via telecommunications to patients in locations where they may not have direct contact with a pharmacist. It is an instance of the wider phenomenon of telemedicine, as implemented in the field of pharmacy.

Telepharmacy services include drug therapy monitoring, patient counseling, prior authorization and refill authorization for prescription drugs, and monitoring of formulary compliance with the aid of teleconferencing or videoconferencing. Remote dispensing of medications by automated packaging and labeling systems can also be thought of as an instance of telepharmacy. Telepharmacy services can be delivered at retail pharmacy sites or through hospitals, nursing homes, or other medical care facilities.

The term can also refer to the use of videoconferencing in pharmacy for other purposes, such as providing education, training, and management services to pharmacists and pharmacy staff remotely.

The purpose of this technical assistance document is to provide valuable information and guidelines for pharmacists, rural communities, and others on how to successfully implement a telepharmacy program designed to restore and retain retail and hospital pharmacy services in communities that are located remotely medically underserviced area.

One of the biggest challenges facing the profession of pharmacy today is closure of rural community pharmacies. Most of these smaller rural communities have only one pharmacy, and one pharmacist who has been faithfully serving the public's health care needs for decades. The pharmacist owners in these communities are at the age when they want to retire and sell their stores, but they are having great difficulty doing so. Rural communities have always had difficulty recruiting health care professionals to practice in the smaller towns. These difficulties are now being compounded by a nationwide pharmacist shortage.

It should be stressed that this model of providing retail telepharmacy services is different than others being proposed in that it includes and retains the active role of the pharmacist as the primary health care provider in the delivery of pharmacy services.

This is done to achieve the highest standard of quality for delivering pharmacy services to rural communities and is also for the protection, safety, and welfare of the public related to ensuring the proper use of pharmaceuticals. This is a value added quality assurance feature which is often lacking in other telepharmacy models that exclude pharmacist involvement resulting in no formal drug utilization review or patient education counseling.

Rural communities across the country are struggling with declining and aging populations, shortages of health professionals, declining access to health care and loss of local businesses. In many cases, mail order is the only pharmacy services available to the public unless they are willing to travel great distances to obtain their prescription medications. Often the poor and elderly in these communities are the least able to access and utilize mail order pharmacy services. Patients obtaining their prescriptions by mail order who have questions regarding their medications find no pharmacist to ask. Loss of access to local services sometimes necessitates patients moving to other communities to be closer to services. This can upset both their family and community life. At the same time it causes negative economic consequences for the community they leave. The resulting out migration is one of the most serious problems affecting many rural areas. Rural Health Clinics have done an excellent job of providing basic primary care to patients living in rural areas but often the pharmacy services have not followed.

2. TYPES OF PHARMACY SERVICES
A. Traditional Pharmacy
Most rural communities want a full service pharmacy which supplies a complete line of health related goods and services. Full service pharmacies provide a complete inventory of prescription and non prescription drugs, including upfront merchandise such as health and beauty aids, and convenience items. Most full service pharmacies in rural areas will have an inventory of approximately 300 or more prescription drugs. Pharmacists provide drug utilization review and patient education counseling at the point of sale.

B. Remote Consultation Sites
In remote consultation sites, there is no prescription drug inventory at the site and it does not require a registered pharmacy technician. Twice each day a courier picks up and delivers prescriptions filled by a pharmacist at a central pharmacy site a short distance away. This model is used by a pharmacist at a central pharmacy site who is serving a rural community a short distance away and who does not wish to manage two separate prescription drug inventories at both the central pharmacy and remote site

C. Hospital Telepharmacy
In these locations prescriptions that are issued at rural hospitals are electronically sent to an urban medical center pharmacy, where they are reviewed, processed, and verified by hospital pharmacists. The hospital pharmacist has access to the patient's electronic medical records, and checks the prescription for proper dosing, allergies, duplication of drug therapy and drug interactions. Then the pharmacist electronically authorizes the dispensing of the prescription through a specialized automatic dispensing divice (ADD).

The prepackaged medication is released electronically via the ADD. A nurse in the rural hospital, with password authorization to the ADD work station, double checks the medication and label, prior to administering the medication to the patient. The pharmacist at the urban medical center is able to electronically monitor the verification process and to oversee the restocking of the ADD via a videoconferencing link. The video conferencing system is also used for consultations between the patient, nurse or physician with the urban hospital pharmacist.

In many remote rural areas, rural hospitals are served by a local retail pharmacy. In these instances, a full inventory of prescription drugs is located at the hospital and is managed and maintained by a registered pharmacy technician with remote supervision by a licensed pharmacist at the retail pharmacy using telepharmacy technology. In these locations a registered pharmacy technician prepares the medication for final dispensing to the hospital floor, nursing home, or swing bed patient.

D. Automated Dispensing Machines
Some Rural Health Clinics may have need for an automated dispensing machine. The prescriber's drug order is provided to the licensed pharmacist at a central pharmacy site electronically or by fax. The licensed pharmacist checks the patient profile, does proper utilization review and then instruct the dispensing machine to release the medication. Automated Dispensing Machines have limited drug inventory (i.e. generally 20 most frequently used medications) and they are usually designed for an urgent dose or first dose to get the patient initially started on their medications (i.e. initiating antibiotic treatment for infection). Patients still require the services of a traditional pharmacy to obtain their maintenance doses to complete their prescription. Telepharmacy Solutions, Inc is one vendor that supplies automated dispensing units.

3. RESEARCH INVOLVING TELEPHARMACY
Satisfaction with Telepharmacy Services
Patients at the remote clinic were surveyed regarding their satisfaction with the telepharmacy services. Overall, patients were very happy with the service. Virtually all patients surveyed indicated that they would have had to travel more than 40 miles (64 Km) to the nearest pharmacy to get their prescriptions filled had it not been for the telepharmacy option at the Turkey clinic. Similarly, virtually all patients surveyed indicated that they would rather see a pharmacist via the telepharmacy system than travel to see the pharmacist in speron.

Telepharmacy and Patient Safety

In 2002, researchers from the North Dakota State University College of Pharmacy, Nursing and Allied Health Sciences received a federal grant to establish a statewide telepharmacy program to save rural independent North Dakota pharmacies from closing as their owners retired and new graduate pharmacists were being lured to other states by higher salaries. As the pharmacist was the only full-time healthcare professional in some of these rural communities, closure of the pharmacy would mean loss of local access to first-contact health care for residents of that community. In the North Dakota model, a registered pharmacy technician at a remote rural telepharmacy site processes prescriptions, supervised by a licensed pharmacist many miles away using videoconferencing technology. Pharmacists also counsel patients directly using this videoconferencing technology.

Telepharmacy Clinical Outcomes
Asthma

Telepharmacy has been used in an attempt to improve the clinical outcomes of patients suffering from reactive airway disease (e.g., asthma). McLean and colleagues undertook a Cochrane review of 21 clinical trials involving telehealthcare and asthma. Only two of the studies reviewed used pharmacists as the main deliverer of the telehealth intervention, and only one of these studies occurred across a great distance between pharmacists and patients.

Diabetes Mellitus

Telepharmacy has also been used to try to improve clinical outcomes in patients suffering from diabetes mellitus. In a Veterans Administration (VA) program, a pharmacist-conducted Tele MTM service resulted in significant improvements in surrogate outcomes markers for diabetes including HgbA1C, systolic blood pressure and low-density lipoprotein among 88 veterans residing in rural communities within Veterans Integrated Service Network (VISN) 12 (Illinois, Wisconsin and the Upper Peninsula of Michigan) who received Tele-MTM services from VA Clinical Pharmacy Specialists.[15] Over a two-year period of Tele-MTM services among female veterans within this VA service area, the percentage of patients with an HgbA1c > 9% decreased by more than 5% at one telepharmacy receiver site and by 11.5% at a second rural telepharmacy receiver site.

Medication Adherence

Telepharmacy services have been employed to improve medication adherence (compliance) among patients. In the United Kingdom, a cost-effectiveness analysis was conducted using results from a randomized controlled trial of a telephone-based pharmacy advisory service to improve compliance with new prescriptions among elderly patients receiving four or more medications.

4. STEP-BY-STEP GUIDE TO CREATING A SUCCESSFUL PROGRAM
A. Starting A Telepharmacy
1. Become Familiar with the Laws and Regulations
a. General principles & first point of contact

Pharmacy probably has more laws and rules in every state than any other area of health care. A careful analysis of existing state and federal laws and rules related to operating a pharmacy is necessary. In order to operate a telepharmacy program, the state must have laws and rules in place for allowing telepharmacy services to operate in the state, and the remote site must be properly licensed with the State Board of Pharmacy.

The state broad of pharmacy should be the first point of contact when considering establishing telepharmacy services to ensure that the current rules and regulations allow this type of pharmacy to operate within the state, and also to ensure that any future plans for establishing telepharmacy services are in full compliance with state law. The State Board of Pharmacy will provide the proper process to follow for officially applying for a telepharmacy permit.

b. License Application

The application for telepharmacy permit must be processed by the licensed pharmacist in charge of owning the businesses of both the central pharmacy and remote telepharmacy sites. In addition to the state license, the applicant must also obtain registration numbers from the National Council for Prescription Drug Programs (NCPDP - formerly NABP number) and the federal Drug Enforcement Administration (DEA).

It is important that the licensed pharmacist obtain State Board of Pharmacy, NCPDP, and DEA registration numbers for each remote telepharmacy site which are separate from the central pharmacy site registration. The State Board of Pharmacy, NCPDP, and DEA registration numbers for both the central pharmacy and remote telepharmacy sites are not only important for operating legally within the state, but they also are needed for obtaining reimbursement from third party payers for telepharmacy services.

c. Third Party Reimbursement

The North Dakota approach to telepharmacy programs mimic "business as usual". The telepharmacies feature the same full service pharmacy operation as a traditional pharmacy. They are supervised by a licensed pharmacist; they are approved and licensed by the ND State Board of Pharmacy, NCPDP, and DEA; and satisfying all ND Board of Pharmacy requirements for the practice of pharmacy.

Once the State Board of Pharmacy, NCPDP, and DEA registration permits are obtained, the remote telepharmacy site is eligible for third party reimbursement claims. For the rural telepharmacy hospital program, dispensing of medication occurs at the

facility where the patient is hospitalized. These hospitals submit claims for patient care, and reimbursement practices are not affected. The central Telepharmacy operation receives its funding from the participating rural hospital sites, which enter into a contractual agreement and pay fees to the Telepharmacy program for the services they receive.

d. Some specific state issues

As of June 2003, North Dakota has telepharmacy laws and rules to allow a qualified pharmacy technician to operate a telepharmacy at a remote location under the technology-driven supervision of a licensed pharmacist.

Other states, such as Minnesota and Iowa, approve telepharmacy requests on a case by case basis. The state of Texas is currently conducting a pilot program in implementing telepharmacy services to the western portion of the state. Alaska is currently conducting a demonstration project supported through HHS to bring medication to two remote, previously underserved communities, through the use of remote drug dispensing machines. Once a state has its laws and rules in place for allowing telepharmacy services to operate in the state, and the remote site is properly licensed with the State Board of Pharmacy, plans can proceed to develop and implement the services.

2. Assess the Need

Rural communities require careful assessment to determine the need for, and the feasibility of, telepharmacy services. Questions need to be answered related to: Are pharmacy (and pharmacist) services currently available in the community? Is there health personnel in the community authorized to prescribe medications (i.e. medical clinic or other health facility) sufficient to support a telepharmacy operation? Is there a convenient cost-effective location to establish telepharmacy services? Is there support for establishing telepharmacy services from the: community, medical personnel, State Board of Pharmacy, local government and businesses, patients, telecommunications company, and pharmacists in the area? Are there sufficient resources available via private, local, and state support to establish such services? When considering establishing a rural telepharmacy hospital program, a different set of questions should be asked. In particular is the nursing staff of the rural hospital willing to support a telepharmacy program? Is the hospital willing to invest in the technology necessary to support the program, and to pay fees to the central hospital telepharmacy? Is the State Board of Pharmacy willing to allow video conferencing technology as a mechanism for pharmacist oversight of nursing staff?

3. Develop Community Partners

Several community partners are needed to effectively implement telepharmacy services in rural areas. In selecting prospective communities for telepharmacy services, it is important to consider the following issues:

community need, interest, and investment in the project; availability of a pharmacist at a central pharmacy site in a nearby community willing to deliver telepharmacy services to the remote site; and support from the State Board of Pharmacy.

4. Secure a Physical Location
a. Criteria to consider for location of retail telepharmacy services

Convenient Access for the Public,
Proximity to other Health Clinic Facilities,
Proximity to Nursing Homes,
Leased after Development by Local Communities,
Owned by the Central Pharmacy,
Leased for the Rural Health Clinic,
if present, Lease space in an existing business.

b. Criteria to consider for starting hospital telepharmacy services

Hospitals need space convenient to nurses' workstations on patient floors and within the ER to locate automatic dispensing devices and fixed video equipment. The hospital pharmacy must also have space for fixed video equipment.

B. Planning Construction
1. Retail Telepharmacies
a. Design

After the needs assessment is confirmed, design experts at the drug wholesaler will draw plans. The licensed pharmacist at the central pharmacy site will also assist in this stage of development. Once plans are developed, they should be submitted to the State Board of Pharmacy for review and approval.

b. Fixtures drug

Store fixtures are available through most drug wholesalers or through companies specializing in these areas. Prices can be bid, or previous projects can be consulted, to determine reasonable prices. Used fixtures can sometimes be obtained through the sale or renovation of a local pharmacy store in the area. Drug fixtures for an average size pharmacy may cost $20,000 or more.

c. Inventory

Inventory always requires capital. The up front store merchandise can be stocked and ordering done as demand is assessed. Prescription drug inventory can be expensive. Purchases should initially be conservative and based on expected demand. Generally for a rural community pharmacy, prescription drug inventory may cost between $60,000-80,000 depending on the brands that are stocked. Factors such as frequent deliveries from the drug wholesaler, the ability to move merchandise between the central pharmacy and the remote telepharmacy site, and limiting inventory/potential losses can help control costs. The licensed pharmacist at the central pharmacy, in consultation with area drug wholesalers, will be able to assist with the initial set-up

and management of the telepharmacy store merchandise and prescription drug inventory.

d. Information Technology Considerations
i. Computer
A traditional full service pharmacy has a computer system installed with a specially designed pharmacy operations software (many software vendors are currently available on the market including QS-1, Midco Data, PDX, Rx30, IsoRx and others) which assist pharmacists in dispensing prescriptions to patients. This pharmacy operations software performs functions such as establishing a patient medication profile; screening for drug interactions, generating prescription vial labels with patient instructions, and billing third party payers.

ii. Video
This is an important part of the telepharmacy system. The video allows the pharmacist at the central pharmacy site to see the finished prescription, which was prepared by the technician at the remote telepharmacy site. The picture from the digital camera is of sufficient quality to allow the pharmacist to read the prescriber's hand written prescription, the label of the manufacturer's original drug container, the label of the prescription vial handed to the patient, and even zoom in and read the identification code on the individual tablet or capsule.

2. Hospital Telepharmacies
The majority of the construction, cost and technology issues cited above for retail telepharmacy programs are the same for rural telepharmacy hospital programs. However, there are some distinct differences. Because hospital telepharmacy programs are implemented in facilities with existing pharmacies, necessary fixtures and inventory should already be in place. The hospitals will either have to begin purchasing medications in unit dose form, or will have to arrange for a pharmacy technician or a local retail pharmacist to repackage medications into unit dose form.

3. Central Pharmacy
Telepharmacy services generally focuses on the remote site, the central pharmacy also often requires some remodelling. Special consideration should be given for ensuring that sufficient space is allocated for a private patient consultation room to accommodate the patient education counselling equipment.

C. Personnel Considerations
1. Pharmacy Technician
The responsibilities of the pharmacy technician at the remote telepharmacy site include maintaining the prescription drug inventory and completing all aspects of the drug dispensing process. Activities include but are not limited to:
(a) Obtaining the prescriber's written prescription order from the patient or taking the order from the prescriber by phone;
(b) Computer drug order entry;

(c) Product selection, preparation, packaging and labelling;
(d) Third party billing;
(e) Operating the telepharmacy technology to connect the audio and video link to the licensed pharmacist at the central pharmacy site;
(f) Providing digital pictures of:
(1) The written prescription order by the prescriber,
(2) The manufacturer's original drug container,
(3) The actual tablet or capsule for proper tablet/capsule identification, and
(4) The technician generated prescription label for the patient;
(g) Obtaining the final check of the dispensed product from the licensed pharmacist; and
(h) Assisting the patient in the use of the telepharmacy technology for the pharmacist education counselling. A step by step protocol is provided for processing new prescriptions and prescription refills.

2. Licensed Pharmacist
The primary responsibilities of the pharmacist at the central pharmacy site are to provide professional consultative services to the remote telepharmacy site for all prescriptions dispensed at the remote site. These activities include but are not limited to:
(a) Performing a final check of the prescription prepared by the technician;
(b) Performing a complete drug utilization review on the patient's medication profile; and
(c) Performing the mandatory patient education counselling.

D. Patient Considerations
It is important that patients are comfortable with the telepharmacy technology prior to receiving services. Consideration should be given to formally marketing the telepharmacy concept to the public prior to implementing services.

This can help the patients and public feel more comfortable and willing to use the services. Special attention and consideration should be given to orientation and education of senior citizens who have not been exposed to, or do not have, extensive experience with technology.

E. Quality Assurance
The licensed pharmacist at the central pharmacy site should establish written policies and procedures related to the delivery of telepharmacy services to ensure the safe and effective distribution of pharmaceutical products and patient care for the central pharmacy and remote telepharmacy sites. The licensed pharmacist at the central pharmacy site should also conduct ongoing review of incident reports and outcomes related to the delivery of telepharmacy services and keep records of appropriate corrective action taken when necessary, to ensure that there is no abnormal frequency or trends of

errors occurring in dispensing drugs or devices to patients.

5. WORKING OF TELEPHARMACY
A patient takes their prescription to their local telepharmacy and gives it to the registered pharmacy technician, who prepares the prescription for dispensing by the pharmacist. Once the pharmacist has approved the prepared prescription, the pharmacy technician brings the patient to a private consultation room for counselling by the pharmacist on the proper use of their medication. Most telepharmacies in North Dakota are full-service sites with a complete inventory of prescription and non prescription drugs. Another telepharmacy model is one in a hospital or other institutional setting. In this case, a registered pharmacy technician prepares the medication, which is checked by a pharmacist at a different location via audio and video computer links before it is dispensed to a patient.

1. A Prescription Arrives at the Pharmacy
Like a traditional pharmacy, prescriptions enter through the pharmacy management system (PMS). Telepharmacy software integrates with your current PMS for a seamless, real-time experience. This allows certified pharmacy technicians to focus on filling scripts.

2. The Prescription is Filled
After the prescription arrives at the pharmacy, technicians prepare it for dispensing by the pharmacist. When telepharmacy first started, technicians would send prescription information to off-site pharmacists via live-video connection. This was an inefficient practice as the both the pharmacist and the technician had to be at their computer on the same screen at the same time.

3. The Pharmacist Verifies the Prescription
Before verifying the prescription, pharmacists can review the patient's medication profile for drug interactions and other potential problems. After the pharmacist reviews the images they can either approve or reject the submission. If rejected, the pharmacist leaves notes for the technician regarding the discrepancy.

4. Live-video Patient Counselling
The remote pharmacist has all necessary patient information, including medication history, readily available during counselling. Patient-counselling sessions are safe, secure and private due to the HIPAA-compliant live-video HD connection provided by most telepharmacy solutions.

6. ADVANTAGES
➢ **Access to healthcare services**
• The primary advantage of telepharmacy is the easy access to health care services in remote and rural location.
• Routine access to prescription medication.

➢ **Economic benefits**
• It is reported that starting a new pharmacy store is much expensive than the cost involved in the equipment and recruitment of pharmacy technician for telepharmacy.
• One skilled pharmacist can provide service to multiple sites. Hence, considering the rising pay scale for pharmacist and further expenses in hiring additional pharmacists for rural sites, costs are minimized.

➢ **Patient satisfaction**
• Medication access and information in rural areas by telehealth has a advantage of patient satisfaction.
• This remotely technology has allowed pharmacists to review patient's medications without them to travel. This has increased patient trust and satisfaction with the services.

➢ **Effective patient counselling**
• Telepharmacy-related services and outcomes in the USA reportes that pharmacist recommend using the webcam-enabed telepharmacy services because they provide better privacy and long counselling duration.

➢ **Minimal scarcity of pharmacists**
• A number of hospitals, clinics, and medical centers in rural setting are currently facing the scarcity of local pharmacy services where medications are supplied without the involvement of pharmacist.
• The pharmacy profession has an impending role to be actively involved in the trials of telepharmacy.

7. DISADVANTAGES
➢ **Pharmacy regulation laws**
• Despite the widespread potential of telepharmacy, the laws and polices that govern pharmacy operations do not adequately address the growing industry.
• Telepharmacy is still a novel concept, and they is delay in the implementation of a new laws, although professional and technological innovations are being used.

➢ **Operational difficulties**
• The rural hospitals and clinics with telepharmacy services experience operational and resource challenges.
• Organizational cultures can also play significant roles as barriers for incorporating and embedding telepharmacy technologies into existing health care systems.

➢ **More time, effort, and money**
• The start-up of telepharmacy involves considerable time, effort, and money.

CONCLUSIONS
Number of pharmaceutical interventions used suggests the importance of telepharmacy as a tool to enhance patient care, especially in remote areas that are commonly deprived of health specialists. Virtual pharmaceutical attention showed positive results and has the capacity to improve the quality of life and life expectancy of patients. Proper guidance on the use and combining of medications and commonly consumed herbal teas with therapeutic potential. Rural residents and communities lack easy access to healthcare services often due to geographical and demographical factors. Telepharmacy holds significant promise as a technology to improve access to pharmaceutical care for people living in rural and remote communities.

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