

# Opportunities and responsibilities for pharmacists on short-term medical mission teams

Curtis A. Johnson, Nora Stieglitz, and Mark E. Schroeder

## Abstract

**Background:** American medical mission teams commonly travel to developing countries for short-term provision of clinical services. Although medications play an important role in the work of these teams, how to plan and organize a mission field pharmacy has been seldom described in the literature.

**Objective:** To describe pharmacist participation in medical mission work.

**Summary:** Global standards and policies, as well as traditional best practices, should be applied to the selection, acquisition, use, and disposition of medications taken into a host country. This report describes the roles and responsibilities of pharmacists in planning and organizing a mission pharmacy and in delivering quality pharmacy services in the field.

**Conclusion:** Pharmacists have an important contribution to make to medical mission teams. Pharmacist knowledge of drug products, regulatory issues, medication storage, dispensing, patient consultation, therapeutic substitution, and pharmacy organization and workflow is ideally suited for mission field work.

**Keywords:** Pharmacists, medical missions, donated medications, expired medications, importation of medications.

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Health professionals serving on short-term medical mission teams are increasingly traveling to underdeveloped regions of the world. Team composition will vary according to the specific type of care provided. Primary health care teams may consist of family practice physicians, internists, pediatricians, nurses and nurse practitioners, physician assistants, dentists, ophthalmologists or optometrists, and logistical personnel to support the work of the team. Surgical teams will include surgeons, surgical and recovery nurses, anesthesia providers, and others dedicated to the provision of surgical services. Few reports describe pharmacist participation on short-term medical mission teams.<sup>1,2</sup> This report explores pharmacist contributions to medical mission teams and offers specific suggestions for pretrip planning and the provision of pharmacy services in the field.

Mission teams rely heavily on the use of medications. Primary care teams use a relatively comprehensive formulary, which for some destinations should include medications to treat tropical diseases, while surgical efforts may require a more focused medication supply. Prescribers in the field frequently need to use an alternative if a preferred medication is unavailable. Pharmacist knowledge of drug products, storage, dispensing requirements, therapeutic substitution, patient

counseling, and pharmacy organization and workflow make them valuable members of any mission team. Unfortunately, many teams consider the pharmacist a low-priority component of the services provided, often delegate responsibility for medications to untrained individuals, and rely heavily on an uncoordinated approach to securing medications for the trip.

Pharmacists and student pharmacists wishing to participate in short-term medical missions will find a large number of sponsoring organizations. An Internet search will lead to many websites of organizations that send medical teams to developing countries. Many organizations are faith based, whereas others are secular. Before volunteering to serve, potential team members should become fully informed of the purpose of the trip, the nature of the sponsoring organization, the type of health care services to be provided, and the cost of participating.

### Pretrip preparation

Allow 6 to 12 months for personal and professional preparation for the trip. Team members will need to secure passports and visas and tend to personal health preparation such as needed vaccinations and malaria prophylaxis. Determine whether the host country will ask for documentation of professional licensure, postgraduate training, or board certification. Spend time learning about the host country and its customs.

Establishing the medication formulary for the team is a vital component of pretrip planning. Pharmacists can take the lead in this effort. The following questions should be considered at the start of the planning process:

- Will the team transport all needed medications to the field or will some medications be obtained locally?
- What types of medical and surgical services will the team provide and how many adult and pediatric patients will be served?
- What diseases are likely to be encountered?
- Will the team treat chronic diseases? If so, do local affordable options exist for medical follow-up and for patients to continue medications started by the team?
- Will the team need controlled substances?
- What is the position of the team or organization and the host country regarding the use of samples and outdated medications?
- Does the destination country have any pertinent regulations regarding the importation of medications?
- Does the team have a budget for purchasing medications or will the team need to rely solely on donated medications?
- What will be the disposition of unused medications at the end of the trip? This is particularly important for controlled substances and high-risk medications such as muscle relaxants, anesthetic agents, and intravenous medications.

If the team is returning to a location previously served, previous experience will help shape the formulary regarding needed medications and quantities. After the parameters have been set for the scope of the formulary, communication among team members is important for coordinating medication procurement efforts. The pharmacist may wish to distribute a draft

#### At a Glance

**Synopsis:** Although many medical mission teams consider pharmacists a low-priority component, pharmacist knowledge of drug products, storage, dispensing requirements, therapeutic substitution, patient counseling, and pharmacy organization and workflow make them valuable members of any mission team. The current work provides valuable insight into pharmacist participation in medical mission work, describing the roles and responsibilities of pharmacists in planning and organizing a mission pharmacy and in delivering quality pharmacy services in the field.

**Analysis:** *Establishing the medication formulary for the team is a vital component of pretrip planning; details to consider include whether the team will transport all needed medications to the field or obtain certain medications locally. The pharmacist may wish to distribute a draft formulary to the prescribers on the team to gain consensus on the types of medications that will be available. Teams should also determine cultural medication-related beliefs that may influence the selection of items for the formulary and the ultimate patient acceptance of prescribed medications. Transporting medications to the destination country will require detailed planning. Because of difficulties transporting controlled substances, teams should attempt to obtain controlled substances from a reliable source within the host country to avoid the need for medical practitioners on the team purchasing and exporting these medications from the United States.*

formulary to the prescribers on the team to gain consensus on the types of medications that will be available. The pharmacist should also offer guidance regarding unwanted or unnecessary medications. Team members may have access to certain donations or sample medications that have little or no value at the destination location. Resist initiating therapy for a chronic disease with a medication readily available in the United States that may not be available or affordable by the patient when the initial supply is gone. Avoid bringing medications that are potentially harmful if used without the ability to assess kidney function (e.g., metformin, glyburide) or without other laboratory information that may influence selection of therapy.

Most American health care providers are unaware of the World Health Organization's (WHO's) lists of essential medications.<sup>3</sup> This document, updated biennially, serves as a guide for developing national essential medication lists. WHO also offers a model list of medications for children.<sup>3</sup> These lists provide guidance to countries regarding the most rational and affordable medications to be used. Trip planners may wish to consult the lists to determine which medications (generally generic products) to include on the formulary. Obtaining a national formulary, if available, from the destination country will also inform the planning process. Using products on the national formulary will increase the likelihood of local availability of medications for continuing therapy after the team has departed.

Teams may wish to identify cultural medication-related beliefs that may influence the selection of items for the formulary and the ultimate patient acceptance of prescribed medications. A few examples illustrate this point:

- Tablets prescribed for cough and cold symptoms may be viewed as inferior to liquid formulations despite having the same active ingredients.
- Suppositories may not be acceptable dosage forms.
- Vaginal preparations may be viewed unfavorably.
- Many cultures have a strong bias in favor of injections rather than oral therapies.
- Local informants are a valuable source of information on cultural beliefs.

Missions involving a surgical team pose challenges because of the special formulary needs of the anesthesia providers. The required medications will depend heavily on the surgical specialties and types of anesthesia required. Simple, reliable, and safe techniques with less intensive postanesthesia care are preferred. Good pretrip communication among the team's surgeons, anesthesia providers, and pharmacist and knowledge of available supplies, equipment, monitors, medication, and personnel at the mission site will aid in ensuring that needed items are available when the team arrives at its destination.

Many cases can be performed with local anesthetics by either infiltration or regional block plus a hypnotic, an anxiolytic, and an analgesic. General anesthesia typically relies on more sophisticated delivery equipment such as intravenous pumps or vaporizers and a compressed oxygen source. Exercise great care when using vaporizers found on site because they may not receive regular maintenance and calibration, thus delivering

unknown concentrations of gas and putting the patient at risk, particularly in the absence of sophisticated agent monitoring mandated in the United States.

The anesthetic formulary may be divided into several parts. These include preoperative medications and sedatives, agents for the induction and maintenance of anesthesia, muscle relaxants and reversal agents, antiemetic agents, analgesics, local anesthetics, and emergency drugs. In selecting these medications, consider the number, duration, and kinds of anticipated surgeries, the availability of equipment for administration and monitoring, the possibility of obtaining medications in the host country, cost, factors related to transport and storage such as weight and the need for refrigeration, and any concerns about leaving excess medications in-country when the mission team departs. The anesthesia provider and pharmacist may wish to conserve space by taking concentrated local anesthetic solutions and diluting them on site to the appropriate strength using normal saline. Volatile anesthetic agents are permissible in checked luggage, but common sense mandates padding the containers well to minimize the potential for breakage.

Table 1 contains a suggested formulary for medical and surgical teams. Obtaining the inventory may seem like a daunting challenge. Teams will rely heavily on donations and purchased medications. Disagreement may occur among team members regarding the role of donated samples and outdated medications. The pharmacist should provide leadership on this issue.

WHO, the International Pharmaceutical Federation (FIP), and the Partnership for Quality Medical Donations have issued guidelines regarding drug donations.<sup>4-6</sup> These guidelines primarily address donations of medications as part of acute disaster relief efforts or long-term humanitarian work; however, the principles can be applied to short-term medical missions. Key pertinent statements from the FIP document include the following:

- No double standards in quality should exist. If the quality of an item is unacceptable in the donor country, it is also unacceptable as a donation.
- No medications should be donated that have been issued to patients and then returned to a pharmacy or elsewhere or that were given to health professionals as free samples.
- All donated medications should have an appropriate shelf life. Normally, a shelf life should be at least 1 year from the time of arrival in the recipient country. (Note: Many countries have specific policies regarding shelf life of imported medications; however, locating these policies may be challenging if the team has no in-country resource person.)

Teams should be aware of these policies to avoid potential difficulty when passing through custom checks upon arrival. An option to consider is purchasing medications locally. This practice supports the local economy; however, locally purchased products may have an unfamiliar appearance, may be labeled in a language unfamiliar to team members, and may represent unfamiliar dosage forms. Recognize that counterfeit medications are common throughout many regions of the world.

**Table 1.** Suggested formulary for medical and surgical teams

<b>Section 1. Primary care teams</b>
<b>Analgesics</b> Acetaminophen Aspirin Ibuprofen/naproxen Tramadol
<b>Anti-infectives</b> Amoxicillin Azithromycin Cephalexin Ciprofloxacin Doxycycline Erythromycin Fluconazole Metronidazole TMP/sulfa Antimalarials selected on the basis of local susceptibility patterns
<b>Antihypertensives</b> Atenolol or other beta-blocker Calcium channel blocker Enalapril Furosemide Hydrochlorothiazide
<b>Allergy/asthma/cough and cold</b> Antitussive Diphenhydramine Loratadine Inhalers (e.g., albuterol)
<b>Antiparasite</b> Anthelmintic: albendazole or mebendazole Scabicide (benzyl benzoate 25% emulsion is useful but not available commercially in the United States; perhaps purchase in-country) Pediculicide (benzyl benzoate 25% emulsion may be used for this purpose also)
<b>Endocrine</b> Oral hypoglycemic agents such as glipizide if treating type 2 diabetes Prednisone
<b>Gastrointestinal</b> Bisacodyl Calcium carbonate Loperamide Omeprazole or other PPI Ranitidine
<b>Vitamins and minerals</b> Ferrous sulfate Multivitamins Prenatal vitamins Topical preparations

Vitamin A&D ointment or similar Antibiotic cream Antifungal cream Hydrocortisone cream Moisturizers Silver sulfadiazine Vaginal antifungal products Sunscreen products
<b>Eye/ear products</b> Antibiotic ear drops Antibiotic eye drops Artificial tears
<b>Miscellaneous</b> Oral rehydration packets Toothbrushes and toothpaste, adhesive strips, gauze, tape, dressings
<b>Section 2. Surgical teams</b>
<b>Analgesics</b> Acetaminophen with codeine Fentanyl injection Ketorolac injection Morphine or hydromorphone injection
<b>Anesthetics and related products</b> Bupivacaine (also for spinal use) Isoflurane or other inhaled anesthetic agents Ketamine Lidocaine Lidocaine with epinephrine Midazolam Propofol Succinylcholine, vecuronium
<b>Anti-infectives</b> Cefazolin injection Ceftriaxone injection Gentamicin injection Vancomycin injection
<b>Miscellaneous</b> Atropine Dexamethasone injection Glycopyrolate Neostigmine Naloxone Ondansetron injection Sterile water for injection and sterile normal saline for injection Viscous lidocaine Anesthesia providers should prepare an individualized kit containing emergency medications or other products that may be required in specific anesthesia circumstances.

Abbreviations used: PPI, proton pump inhibitor; TMP/sulfa, trimethoprim/sulfamethoxazole. Include pediatric formulations as appropriate. In-country purchase of prepackaged small volumes (60–120 mL) of selected medications may be a suitable and cheaper alternative to transporting bulk liquids and prescription bottles in luggage.  
Note: This suggested formulary is for planning purposes only and should be modified according to the anticipated needs in the field and the prescribing preferences of team members.

Many team members will have a strong urge to collect and bring free samples. As noted above, this practice is discouraged. Usually, medication samples are for new products (non-generic) that may not be available and affordable for chronic use in the destination country. Sample donations may also have very short shelf lives and usually come with excessive packaging representing unneeded volume and weight for transport. Removal of doses from sample packaging could result in loss of product identity and removal of expiration dates.

Selected pharmaceutical companies offer charitable programs for donating their products to humanitarian groups. Although these donations can be helpful, they may come as bundled items including products that have limited value for the specific needs in the field. Pursuing this source of donations requires much advance planning and may necessitate considerable company and regulatory paperwork.

Mission teams may also elect to work with various companies or humanitarian organizations that distribute free or low-cost medications. Examples are MAP International, Blessings International, the IDA Foundation, Kingsway Charities, and MedPharm.<sup>7-11</sup> Contacting these organizations early to check on organizational policies, product availability, and ordering procedures will assist in planning inventory procurement. Traditional pharmaceutical wholesale companies may also offer attractive pricing for medications purchased for international humanitarian work. Friends and family members of team members may wish to contribute needed over-the-counter medications.

Transporting the medication inventory to the destination country will require detailed planning. Medications should be packed and transported as checked baggage. Remove as much excess packaging as possible without breaking tamper-resistant seals, compromising product identity, or removing expiration dates. Airline-imposed baggage weight limits must be observed to avoid excess fees. Medications may need to be distributed among team members to avoid excess baggage weight for any individual. Some mission organizations provide a letter to place in baggage explaining the humanitarian reason for transporting medications. The Transportation Security Administration (TSA) has no specific regulations for transporting large quantities of medications for this purpose. Pack medications in carry-on luggage according to TSA regulations for liquids and gels. Surgical teams should secure an in-country source for intravenous solutions to avoid transporting these heavy fluids.

Travelers may be asked to describe and declare items being imported into the host country. Policies and the application of those policies will vary by country. Mission teams have experienced unexplained confiscation and taxation of donations being brought into the country, which can be a frustrating experience. Declaring the "value" of medications by U.S. standards may greatly overstate the value (market price) by host country standards, leading to excessive import taxation. WHO recommends valuing a donated medication according to the wholesale price of its generic equivalent in the recipient country or, if such information is unavailable, on the wholesale world-market price for its generic equivalent. If the donated medication

is a patented product for which no generic equivalent exists, the wholesale price of the nearest therapeutic equivalent may serve as the reference.<sup>4</sup>

Obtaining and transporting controlled substances requires special consideration. Teams should attempt to obtain controlled substances from a reliable source within the host country to avoid the need for medical practitioners on the team purchasing and exporting these medications from the United States. In-country purchase also avoids the vagaries of importation into the host country and of personally carrying the medications through frustratingly unpredictable customs inspections. If these medications are not reliably available, then the team's best option is transporting them into the country. Controlled substances should not be obtained by filling personal prescriptions written for team members.

The proper approach for obtaining controlled substances is for a licensed U.S. practitioner with a valid Drug Enforcement Administration (DEA) registration to order the needed medications from a wholesaler or pharmacy using DEA form 222. These forms may be ordered at no cost on the DEA website.<sup>12</sup> The practitioner should then contact the U.S. Department of Justice, DEA, Office of Diversion Control, Import/Export Unit, to determine the information currently needed for issuing an exception/waiver letter to exempt the transport of controlled substances for overseas humanitarian medical and dental mission trips from standard DEA shipment requirements. The required documentation will include information identifying the U.S. practitioner, a description of the controlled substances to be transported, a statement that none of the controlled substances will be brought back into the United States, documentation from the competent authority in the host country indicating that the mission team is known to them and granting authorization to carry the controlled substances into that country, a description of the purpose of the mission trip and why the transported controlled substances are not available in the host country, and finally a complete itinerary and contact information for the sponsoring organization (DEA, personal communication, October 2008).

With the specific requirements for an exception/waiver letter, the DEA Import/Export Office will include contact information (if it is known) for the competent authority in the destination country. The DEA Import/Export Office recognizes that obtaining authorization from the host country competent authority may be difficult. If a good faith but unsuccessful effort has been made to obtain authorization, DEA will issue an exception/waiver letter but will note that authorization has not been received and transport of controlled substances into the destination country is subject to the appropriate national authority. Documents in a foreign language must be translated before forwarding to DEA. All documents should be furnished to DEA at least 15 to 30 days before departure. Exception/waiver letters are issued by both fax and hard copy close to the time of departure so that any last-minute changes may be incorporated without issuing a second letter. Although this letter is necessary, it does not preclude further review by U.S. Customs and TSA on departure from the United States.

Pretrip planning by the pharmacist should also include consideration of supplies, equipment, and other resources needed on site. The following items will be useful:

- Counting trays and spatulas
- Containers for dispensing solid and liquid dosage forms
- Graduated cylinders and small funnel
- Intravenous admixture labels
- Indelible markers and notepads
- Paper towels
- Garbage bags and duct tape
- Large ziplock bags or paper sandwich bags (for patients to carry multiple prescriptions)
- Needles, syringes, alcohol swabs, and sterile water for injection for sterile product preparation
- Filter needles
- Small pieces of plastic sheeting to create “clean space” for intravenous admixture preparation
- Flashlight
- Scissors
- Drug references (electronic or paperback), pediatric dosing guides
- Preprinted and blank labels for prepacking “fast movers”
- Oral syringes and dose cups
- Rubber bands
- Backpack (to carry medications in case of mobile clinic)
- Small calculator
- Clip clothespins or small plastic baskets or buckets (to keep multiple prescriptions for a single patient together while in the queue for filling)
- Hand sanitizer
- Clean water (for reconstituting lyophilized oral antibiotic preparations; may be obtained locally)
- Sharps container
- Tablet splitter, small mortar and pestle, or other tablet-crushing device
- Sterile and nonsterile gloves
- Language-appropriate auxiliary labels (e.g., external use, shake well)
- Language-appropriate printed instructions for home preparation of oral rehydration solution

**Pharmacy organization and workflow in the field**

After arriving in the field, attempt to organize the pharmacy before opening of the clinic. Space is often very limited and of poor quality. Creating workspace with adequate tables or shelving, lighting, and ventilation should be a high priority. In some destinations, anticipate periodic loss of electricity. Create a clean space if preparing sterile products. Display the medication inventory for easy access. Consider how the pharmacy will be secured at the end of the day.

Anticipate that the pharmacy will be the center of much activity, with frequent visits from team members seeking information or drug products and from patients seeking prescriptions. Establish a workflow that allows easy retrieval of needed medications, space for filling prescriptions, and an area for

speaking to patients. At times, the number of patients waiting may seem overwhelming. Such an environment is ripe for medication errors. Limiting access to the pharmacy to reduce the amount of traffic and distraction may be necessary. If possible, keep waiting patients out of the pharmacy unless invited in for medication consultation. Language issues and the busyness of the pharmacy increase the possibility of giving patients the wrong prescription. Confirm that the intended patient is receiving the medication being dispensed.

Interpreters will bridge language differences. Perhaps a team member fluent in the local language can serve as the pharmacy interpreter. Otherwise, local service organizations, schools, churches, or other groups may provide interpreters. Hearing information about medications in their own language will help patients trust and understand the care they receive.

One way to manage language and health literacy barriers is to use pictures or symbols to depict directions for medication use. Individual ziplock dispensing bags that illustrate the time of day a medication is to be taken, the dosage form (e.g., tablets, teaspoonfuls), and the duration of therapy, as well as a place to write the patient’s name, are well suited for field use. Teams may wish to use these bags as the written prescription. Using nonsmearing ink, prescribers can write on the bag the name of the patient and the required information about the medication prescribed. The patient then brings the bag to the pharmacy, the appropriate instructions are marked on the bag, and the medication is placed in the bag for dispensing. Dispensing bags of this type are available from organizations such as Blessings International or the IDA Foundation. In most field work, little or no patient-specific medication record keeping is required.

For liquid medications, the pharmacist may wish to provide a dose cup or oral syringe marked indelibly to indicate the prescribed dose. Demonstrating the use of a dose cup or oral syringe for the first dose will help a caregiver understand proper dosing. Tablet splitting may also be offered, particularly if tablet-splitting devices are not available to patients. Many patients will have no means of refrigerating medications; therefore, dispensing and consultation will need to be tailored accordingly.

Medications that will move quickly from the pharmacy may be prepackaged in appropriate quantities. Prescribers on the team should be made aware of prepackaged medications, including their strength and quantity, in order to instruct patients correctly. Someone on the team may volunteer to print prepack labels before departure from the United States. Avery 8167 (or equivalent) labels work well for this purpose. Prepacking should be done before or after clinic hours, and other team members should be invited to assist in the effort. In high-volume clinics, selected prepackaged medications such as vitamins, ibuprofen, or anthelmintics may be placed at the prescribers’ station for dispensing, thus avoiding the need for the patient to stop at the pharmacy.

Pharmacists should prepare for the inevitable request for medications from patients’ family members, staff members of the host health care facility, translators, or other locals at-

tracted to the clinic site. The sight of a medication supply often prompts a request for a medication perceived to be needed by individuals who are not patients being seen by the team. Prepare a culturally sensitive response explaining why such requests cannot be fulfilled.

At the completion of the trip, there will be unused medical supplies and medications. Have a plan for the disposition of these items. Will they be returned to the United States? Consider whether the team will return to the same location in the future. If so, can the unused items be stored locally safely and at the appropriate temperature and humidity? What is the shelf life of the unused medications? Can items be donated to local health care providers? If so, can local health care providers read English labeling? What needs to be destroyed?

WHO provides a list identifying types of medications that should always be considered waste.<sup>13</sup> The list includes all expired medications, all unsealed syrups, eye drops, and tubes of creams or ointments (regardless of expiration date), any medication that requires storage in cold conditions that was left at room temperature for any period of time, and all bulk or loose tablets or capsules. The procedure for disposal of unwanted medications in the United States usually involves high temperature incineration; however, incineration capabilities are rarely found where mission teams travel. What local policies and facilities, if any, exist for medication and sharps disposal? Ensure that disposal procedures do not involve dumping unwanted items into landfills, lakes, or rivers, that they are not subject to illegal diversion, and that humans and animals are not exposed to them. WHO offers guidelines for landfill disposal of medications; however, the guidelines are designed for use by governmental authorities and are generally impractical for short-term mission teams with small to medium amounts of waste products.<sup>13</sup> Liquid pharmaceuticals, such as intravenous fluids and syrups, may be diluted and flushed into local sewer systems, small amounts at a time.<sup>13</sup> The team should avoid bringing expired medications back to the United States, as expired or spoiled medications that are transferred internationally are considered hazardous waste and subject to complicated international shipping regulations.<sup>13</sup>

### The trip home

The trip home and the posttrip period can be difficult, especially for first-time team members, but also exhilarating. Participants will be tired, they may be emotionally spent, they may realize they have made just a dent in the need, and they may be leaving others with whom they have shared an intense experience. The time after the trip will be a time for reflection and describing experiences to those at home, readjustment to pretrip lifestyles and work routines, and analysis of the team's activities and accomplishments. Many team members will become excited about how to mobilize other people and resources to

carry on the mission work. The posttrip period should be used to make notes for future trip planning and to evaluate critically the effect that the team had at its destination. Did the team's efforts enhance local health care resources? Did the pharmacy fulfill its mission on behalf of the team? Will the team's work be sustainable? Did team members display an attitude of service while in the field?

### Conclusion

Serving on a short-term medical mission team can be a remarkable and humbling experience. Being part of a group that is willing to offer high-quality professional skills, health care, and needed medications to disadvantaged people of the world is a privilege. From pretrip planning to providing pharmacy services in the field, pharmacists can make valuable contributions to the team and to the patients served. The first trip may be the beginning of a long journey of mission work.

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