

VIEWPOINT

Strengthening Global Health Outreach Programs Through Pharmacy Services



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INTRODUCTION

In recent years, there has been a surge in global health outreach programs to address health care challenges and disparities in resource-poor countries.¹⁻³ The scope of these outreach programs ranges from direct patient care services such as dental, surgical, and medical care, to large-scale public health programs affecting health care systems. Oftentimes medication formulary generation, pharmacy setup, workflow, and dismantling responsibilities are assumed by a variety of health care providers with other direct patient care functions. This can lead to poor use of limited health care resources, dosing errors, improper medication handling, and caregiver exhaustion, which may ultimately result in substandard patient care. Unfortunately, teams deployed to resource-poor settings often fail to use pharmacists because team members are unaware of pharmacists' unique clinical and logistical expertise.^{4,5} Integration of pharmacy services into health care teams already occurs in the US Medical Reserve Corps, USAID (US Agency for International Development), the Peace Corps, disaster medical assistance teams, free clinics, and nongovernmental medical service teams.⁴ In many such organizations and settings, pharmacists oversee pretrip formulary management, drug acquisition, pharmacy setup, and pharmacy work flow. Pharmacists also provide clinical consultations, dispense medications, manage inventory, and dismantle pharmacies when outreach programs are completed.^{4,6-8} Described here are the specific benefits pharmacists bring to strengthen surgical and medical service teams. This

article also explores how student and resident pharmacist participation early in professional training can help increase pharmacists' visibility in global health outreach programs. This in turn will help ensure the sustainability and scalability of future initiatives.

SURGICAL SERVICE TRIPS

Planning medication formularies with service team members is vital to ensure smooth operations when delivering surgical care abroad. Typical stakeholders responsible for formulary management may include a team anesthesiologist, surgeon, trip coordinator, pharmacist, and in-country coordinator. The team meets several months before the service trip to vet the medication formulary and order appropriate medications. There are several factors that affect medication formulary generation. These include budget constraints, the types and volume of surgical cases anticipated, provider preferences, local patterns of antibiotic resistance, consideration of international laws on controlled substances, and appropriate postoperative and discharge medications. The surgical trip formulary typically includes an array of preoperative, intraoperative, postoperative, and discharge medications (Table 1).

Once deployed abroad, pharmacists are responsible for unpacking medications and setting up the pharmacy area before the first day of surgeries. Adequate daily supplies of anesthetics, paralytics, and reversal agents are allotted to each anesthesiologist on the team. Preoperative intravenous antibiotics are prepared and refrigerated the night before for the next

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Table 1. Sample Surgical Service Trip Formulary

Anesthetic gases	IV antibiotics
Local and regional anesthetics	Clotting products
Intravenous (IV) fluids	Clot-dissolving products
Sedative agents	Topical wound care medications
Paralytic agents	Antidiabetics
Amnestics	Albuterol and other inhaled medications
Analgesics	Antiseizure medications
IV pressors	Antiemetics
Laxatives	Reversal agents
Antihypertensives	Miscellaneous

surgery day. A perpetual inventory of controlled substances dispensed is logged. Anticipated postoperative medications are compounded in advance and dispensed to keep patients safe and comfortable. Overnight medications for postoperative patients are prepared, labeled, and stored in patient-specific bins for easy access by nightshift personnel while the core team is off site. In addition to the primary responsibilities of dispensing, counseling, and inventory control, pharmacists also perform clinical consults by recommending therapeutic substitutions, dosing medications, providing antimicrobial stewardship, and monitoring for drug interactions and allergic drug reactions. A typical surgical service trip has a limited antimicrobial selection. Physicians rely on pharmacists to recommend therapeutic substitutions to cover pathogens local to the area as determined by the host country's Ministry of Health. In addition, a patient discharge list is created each day to facilitate advanced medication preparation and labeling for timely dispensing of medications.

The pharmacist needs to work closely with host country staff to collaborate in educational efforts and solve any inventory or direct patient care concerns. The last day of the trip is spent on inventory management and pharmacy dismantling. This requires the pharmacist to work with another licensed provider to account for all remaining controlled substances, destroy unusable medications, and pack excess medications for donation to incoming surgical teams. After the trip, stakeholders need to regroup to assess the adequacy of the formulary used, make modifications, and devise a supply chain plan for future outreach programs.

MEDICAL SERVICE TRIPS

Chronic disease care in developing countries is typically done by deploying general medicine teams.

Table 2. Sample Medical Service Trip Formulary

Chronic Medications	Acute Medications
Antihistamines	Analgesics
Antihypertensives	Antibiotics
Antispasmodics	Antifungals
Anthelmintics	Antimalarials
Diuretics	Antiparasitics
Insulin and other diabetes medications and delivery devices	Albuterol and similar products
Lipid-lowering medications	Corticosteroids
Malaria prophylaxis	
Ocular medications	
Psychiatric medications	
Antiseizure medications	
Supplements/vitamins	

Medications for acute illnesses are also necessary (Table 2). Medical teams vary by size and specialty depending on the results of the needs assessment performed by local staff of the host country. Key stakeholders must also determine the specific scope of services provided, which may include general medicine, pediatrics, gynecology, dentistry, and ophthalmology. They must ascertain the appropriate medications for the anticipated medical conditions. When available, prevalence data for chronic and acute diseases and injury patterns for the target country should be reviewed. Medical teams from developed countries often encounter unfamiliar illnesses (eg, malaria, Chagas disease, and guinea worm) and different patterns of injury than they would typically have diagnosed and treated in their countries of origin. When establishing a service trip formulary, it is important to consider the prevalence of certain genetic conditions such as G-6-PD, sickle cell, and so on in choosing medications for a given population. Serious medication-related adverse effects, the absence of monitoring capabilities, and the lack of refrigeration are also key factors that affect formulary generation. Once the medication formulary is complete, medicines and supplies can be obtained from donations or low-cost purchases from organizations that specialize in supplying volunteer medical trips. Expired medications or supplies should never be used because the viability and safety of these products cannot be verified. Ordering must be done well before the trip date to provide time for shipping and processing medications. Medicines need to be repackaged in convenient sizes and relabeled with all necessary information to ensure safe and efficient dispensing. Shipping must be done in such a way that

medication integrity is not compromised. Customs laws must be known and followed.

Before deployment, the key stakeholders from the team and local liaisons must identify a safe location for the clinic. Once the team has arrived in-country, volunteers should set up the pharmacy in a safe and secure area, usually at one end of the clinic, near an exit, to facilitate patient flow. The pharmacy itself needs an intake area to receive written orders and a pickup area where patients obtain their medications along with oral consultations in their language. Drugs in the pharmacy should be physically arranged in alphabetical or some other appropriate order to facilitate easy, efficient, and accurate filling. While technicians or pharmacy helpers prepare orders, the pharmacist checks and reviews orders before medications are dispensed. The pharmacist needs to be available for consultation with providers and patients throughout clinic hours. A translator is particularly essential for patient counseling. Additionally, some patients may have limited literacy; therefore, written directions must be as simple as possible. Directions will need to be read to the patient, followed by oral feedback to ensure comprehension. For multiday clinics, the pharmacist needs to let providers know in advance of potential medication shortages. The pharmacist can then suggest alternative medications for consideration.

At the end of the clinic, remaining medications must be stored properly if they are to be used for another clinic or destroyed if they will be outdated or unusable. Pharmacists should work with in-country coordinators and providers to ensure continuity of care for patients who require ongoing monitoring and follow-up. Finally, after the clinics, the pharmacist should evaluate the suitability of the formulary used and make suggestions to improve on it.

PHARMACIST STUDENT AND RESIDENT INVOLVEMENT

As more and more pharmacy schools across the United States develop and provide global experiential and educational programs for students, the number of pharmacy students interested in global health continues to increase.⁶ International educational opportunities such as elective medical outreach courses and advanced pharmacy practice experiences offer pharmacy students an opportunity to provide direct medical care to resource-poor

populations under the supervision of a pharmacist.^{7,9} Outreach programs present a unique environment for students to apply their skills and knowledge while gaining hands-on experience. This occurs primarily through participating in patient triage, developing patient care plans with physicians and experienced pharmacists, making therapeutic recommendations, dispensing medications, and providing patient education.⁷ Under the guidance of a preceptor, pharmacy students learn to appreciate the complexity of providing optimal care abroad in the setting of language barriers, cultural differences, storage challenges, and stock outs.⁷

For many student pharmacists, pharmacy schools may provide their first opportunity to participate in global health service programs. As students graduate, many enter clinical training through the American Society of Health-System Pharmacists' accredited pharmacy residency programs. Another possible way to increase pharmacist expertise in global health efforts is to more deliberately embed global health programs into pharmacy residencies. Several American Society of Health-System Pharmacists-accredited residency programs in the United States already formally incorporate global health rotations into the resident learning experience.⁸ Such rotations provide a novel, collaborative learning environment where pharmacy residents must think critically and innovatively. At the same time, residents provide compassionate care for vulnerable patients early in their training. Exposure to such seminal experiences will help bolster the pharmacy role in future global health efforts.

CONCLUSIONS

Pharmacists' roles in global health outreach programs are diverse, ranging from managing supply chain logistics to providing clinical consults. Increased pharmacist involvement in global health outreach programs improves limited health care resource use and optimizes caregiver roles. This, in turn, increases safety and efficacy when providing care abroad. Resident and student pharmacists benefit from being integrated into these outreach programs. Such experiences enrich clinical training by affording opportunities to provide direct, compassionate care to patients while exercising critical thinking in challenging environments. The enculturation of pharmacy team members through such outreach participation will help strengthen global health programs in the future.

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