

The REMEDY Program: Recovery and Donation of Unused Surgical Supplies to Developing Countries

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ABSTRACT

Disparities in worldwide health care are particularly evident when one travels to clinics in developing countries, there lack of access to proper medical supplies is often the rule. REMEDY is a program designed to recover usable medical equipment that would otherwise be discarded from United States hospitals. These materials are donated to medical facilities where they are desperately needed. REMEDY at the Albert Einstein College of Medicine has been active in collecting and distributing excess supplies since 1997. After describing the REMEDY program is general the legal and ethical issues involved in donating medical supplies will be discussed. To determine the need for REMEDY supplies abroad, a survey of desired material for clinics in South America was performed. Rural and primary care clinics typically lack basic supplies, such as gloves, needles, sutures, gauze, and catheters, while larger institutions have a need for more specialized equipment, such as ultrasound or electrocardiogram machines, and computers are needed at all levels of health care. REMEDY represents a cost-effective means for the donation of lifesaving medical equipment abroad, and a way for medical students to get involved early in international health and environmental issues.

INTRODUCTION

The practice of medicine in the United States is typified by a seemingly endless array of technologically advanced medical instruments. Medical student training at academic medical centers is performed in a situation where needed supplies are readily available and easily accessible, and the cost of these supplies is normally not a factor in determining the appropriate course of patient treatment. In stark contrast to this enviable environment, medical centers in much of the developing world are characterized by a lack of some of the basic supplies required for proper patient care. Those who have traveled to or worked at clinics overseas are acutely aware of how difficult it is to treat patients with such constant equipment shortages. In these areas, recycling and reuse of medical items is the rule, and empty shelves are a common sight.

In order to address this discrepancy in health care delivery between relatively rich developed nations and relatively poor developing ones, the concept of REMEDY,

standing for recovered medical equipment for the developing world, was created. While individual health care practitioners have for years collected and donated medical equipment to clinics in need, REMEDY is an attempt to systematically incorporate collection efforts into everyday hospital routine. The goal of REMEDY is to collect unused medical supplies from hospitals that are appropriate for donation to clinics in the developing world. This can occur without disruption of the normal hospital routine and has the added benefit of reducing the quantity of medical waste generated by donating hospitals.

The REMEDY program was first established at the Yale-New Haven Hospital (YNHH) in 1991 concurrently with a large donation effort in reconstructive surgery following the December 1988 earthquake in the former Soviet Republic of Armenia (Ariyan and Rosenblatt, 1994). Materials were recovered from hospital operating rooms (ORs) on a case-by-case basis, sterilized, sorted, and sent to receiving institutions through established United States based charities. ORs were chosen as the primary source of supplies due to the routine practice of preparing more than the requisite amount needed and discarding the remainder upon completion of the surgical procedure. Following its successful implementation at YNHH, educational materials were made available to those interested in beginning a similar project at other institutions.

HOW REMEDY WORKS

Material destined for donation through REMDY can be recovered in a variety of ways. Items may be collected on a case-by-case basis from surgical ORs or from excess inventory through OR managers. REMEDY at the Albert Einstein College of Medicine (AECOM) uses several collection techniques, with the bulk of material originating from Jacobi Hospital surgical floors. Training sessions with the OR nursing staff were performed to familiarize them with the purpose and scope of REMEDY. They were instructed on commonly recovered equipment and specifications for REMEDY equipment (no exposed sharps, no body fluids, clean items only). Following this, unused and uncontaminated surgical supplies that would have been discarded are collected on a case-by-case basis by OR nurses and placed in REMEDY storage containers. These are transported on a regular basis by medical students to the REMEDY supply room, where

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they are inspected and sorted by volunteer staff trained in universal precautions. Material to be donated is inventoried and stored for donation, and defective material is discarded. Other recovery strategies used by REMEDY at AECOM are collection of excess supplies from Bronx-Lebanon Hospital and individual donations.

Donation and shipping of REMEDY supplies to their final destination relies on contacts made with receiving institutions and established United States based charities. Medical personnel traveling to clinics abroad are encouraged to bring a suitcase-sized bag or box of REMEDY supplies with their personal luggage. Typically, these are medical students or doctors performing summer or short-term clinical projects in developing countries. In this manner, the arrival of REMEDY items to their final destination can be assured, and some feedback on the usefulness of these items is generated. Traveling volunteers should inquire about which supplies are most needed, and every effort is made to supply requested items. Although this delivery method has not encountered problems with customs officials at receiving countries, all personnel are told to bring a letter from the receiving institution regarding the expected shipment, a REMEDY based letter detailing the nature and purpose of the program, and a medical identification card.

Donations are also made to established United States based charities and groups planning to travel to developing countries on medical missions. REMEDY at AECOM has worked with several receiving organizations, including American Medical Resource Foundation, Physicians for Social Responsibility, and Pastors for Peace, and has made donations to groups traveling to Tanzania, Iraq, Kosovo, Guatemala, El Salvador, and Cuba. Donations have also been sent with individuals traveling abroad to Ecuador, Peru, Mexico, Kosovo, India, Venezuela and other countries. REMEDY typically donates about 600 lbs. of medical equipment yearly, with an estimated market value exceeding \$15,000. The most commonly donated items are sutures, gloves, gauze, drapes, and sterilization kits, followed by catheters, intravenous tubing, airway tubing, sponges, staplers, syringes, and reusable surgical tools. Those who have gone abroad with REMEDY supplies have reported a significant positive impact on local health care at the receiving clinics. Most receiving clinics have expressed the desire to receive additional donations, indicating the clinical usefulness of the donated supplies.

EFFECT OF REMEDY ON OPERATING ROOM COST

The cost to hospital of the REMEDY program is extremely low, consisting primarily of collection containers and use of storage space. Volunteer labor is provided by hospital staff, medical students, and other interested parties. REMEDY at AECOM uses large recycling bins that can be brought into the OR after a procedure during cleanup,

minimizing the amount of time that OR nurses separate usable items from medical waste. For an annual budget of approximately \$200 spent mostly on boxes for storage and shipping, REMEDY is able to recover thousands of dollars of usable medical equipment (Rosenblatt et al., 1993). The resulting reduction in medical waste disposal actually saves the hospital 6 to 10 times the cost of the program, as well as raising staff members' awareness of waste and recycling issues (Czajkowski-Beckwith and Rosenblatt, 1996). Additionally, the data generated from the types of items recovered can be used to increase the efficiency of OR supply management (Rosenblatt and Silverman, 1994; Rosenblatt et al., 1997). Overall, REMEDY is a cost-effective program with benefits to donating hospitals as well as receiving institutions.

LEGAL ISSUES

It must be kept in mind that their manufacturers do not warrant single-use surgical supplies that are recovered and reprocessed for donation. Hospitals that donate such material have not been held liable for device malfunctions, but due to such concerns, REMEDY provides a disclaimer statement to be included with donated materials (Czajkowski-Beckwith and Rosenblatt, 1996). While some programs resterilize contaminated material in accordance with World Health Organization guidelines for emergency and relief efforts (Decker, 1989), REMEDY at AECOM does not resterilize items, indicating that only unopened packages are sterile. Liability concerns among drug manufacturers currently limit the collection of medications, including those recently expired, hence REMEDY does not collect or donate medications. Opportunities exist, however, for the donation of medications directly from the manufacturer to the receiving organization, and the REMEDY program encourages such efforts.

ETHICAL ISSUES

There are several ethical issues raised by the donation of medical equipment regarding the needs and capacity of the receiving organization, as well as the motives and quality assurance of the donating organization. In order to be useful, the supplies must be able to be incorporated into local health care practice, making many technologically advanced instruments unsuitable for donation. Preventing donation of defective supplies is also of primary concern, since device failure could result in adverse patient outcome. This concern is heightened by the fact that REMEDY supplies cannot be assumed to be under manufacturer warranty. REMEDY at AECOM uses a quality control system in which damaged or stained material and sharps not in their original packaging are discarded during sorting. However, device failures may still occur, so recipients are made aware of this possibility. Given the typical practice of reuse of medical equipment at many of the receiving clinics, the donation of medical

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equipment believed to be useful and functional is generally deemed to be ethically sound.

EFFECTIVENESS OF REMEDY SUPPLIES

One of the key questions regarding REMEDY-style donations of medical equipment is the effect that these supplies have on the quality of care at the receiving institutions. The program strives to help supply useful and life-saving materials to underserved communities rather than simply ship boxes of useless medical waste. For example, what good would it do to send syringes if no needles are available, or an EKG machine to a community without electricity? In order to address this issue, primary medical centers in South America were surveyed regarding which items would be clinically useful. Sixteen centers in Venezuela, Columbia, Ecuador, and Peru ranging from rural ambulatory clinics to regional hospitals were surveyed, yielding a cross-sectional perspective on the equipment needs at different types of health care settings. The results are summarized in Table 1, which is recommended as a guide to those bringing supplies abroad. In general, primary care clinics, particularly in rural settings, lack some of the most basic supplies such as gloves, gauze, sutures, syringes and sterilization solution but are unable to use equipment designed for more invasive procedures such as intravenous and airway access. Larger medical centers have a more pressing need

for advanced equipment including ultrasound and EKG machines and can utilize most types of surgical kits. Interestingly, there is a need for computers at all levels, as clinics in developing areas strive to enter the information age.

The survey also revealed information regarding the functioning of the health care system in these countries, much of which is generalizable to the developing world. While there are country-to-country differences, there are usually four levels of health care settings. Level 1 consists of rural primary care clinics, which usually have nursing staff available although their training may be minimal. Doctors or advanced medical students visit these clinics regularly, though they may be present for only several hours any given week. Basic supplies and medications may or may not be available, and patients are often required to purchase them from the clinic or outside pharmacy. Level 2 settings are similar but have more regular staffing and are often located in small villages. These clinics deal primarily with minor illness, pregnancy and well-child care, and accidents. As such, they are excellent places for medical student training in primary care, obstetrics and gynecology, pediatrics, and emergency medicine.

Each of these centers is associated with a Level 3 regional hospital, which is located in the largest town in the area and has modern facilities and doctors trained in a variety

TABLE 1 | Summary of useful items for donation at various levels of health care settings

Type of Clinic	Level 1, Level 2	Level 3, Level 4
Location	Rural, Small Village	Town, City
Funding	90% Government 10% Private	70% Government 30% Private
Items Requested	Gloves Needles Syringes Sutures Gauze Surgical Gowns, Masks Sterile drapes Catheters Computers	IV Tubing and Supplies Needles Gloves Sutures Catheters Ultrasound Machines* EKG Machines* X-ray Machines* Centrifuges* Refrigerators* Computers

* Check with institution for specific details

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of medical specialties. Patients requiring surgery or inpatient care are sent to these hospitals, which have most basic medical and surgical supplies but may lack advanced diagnostic equipment. Level 4 hospitals are found in the largest cities and have well-trained doctors and staff using modern diagnostic and treatment techniques. Some countries also have a Level 5 academic medical center comparable to most United States research hospitals.

Health care in these countries is funded primarily through the government, although more recently a system of private health insurance, laboratories, and hospitals has developed. All citizens are eligible for free health care in government-run clinics and hospitals, although the wealthier tend to use private for-profit facilities, which operate on a much faster schedule. In practice, even those using state hospitals are required to pay for some amount of their care (see Table 1) and have to buy their own supplies and medication when it is not available. These obstacles to treatment often delay or prevent proper administration of medical care to the poorer members of society, resulting in a more protracted and severe course of illness, further straining the resources of this community. Additionally, the most poor tend to be located in rural areas, which have the least amount of materials available and hence the most need for REMEDY-type donations.

CONCLUSION

The REMEDY program serves as a way to recover excess usable medical equipment for use in to developing countries, where there is a pressing need for such supplies. Benefits of the program include increased availability of medical items to those most in need, reduction of medical waste, and increased awareness of recycling and international health issues. REMEDY at AECOM has a mechanism in place for the collection of excess surgical supplies from hospital ORs and the quality control system to ensure that only functional supplies are donated abroad. In a survey detailing desired donations

in South American clinics, a distinction was seen based on the size and location of the institution. Smaller, rural clinics usually lack basic medical items, such as gloves, sutures, needles, gauze and catheters, while larger clinics and hospitals have a need for advanced diagnostic equipment, such as X-ray, ultrasound, and EKG machines. Institutional contacts made through REMEDY often lead to medical student involvement at these clinics, with unique training opportunities in primary care fields. REMEDY at AECOM plays a significant role supporting the work of our colleagues in developing countries and is an excellent way to become involved directly in improving international health abroad while reducing medical waste disposal locally.

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