

The Role of a Dermatologist on Military Humanitarian Missions

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The US military in conjunction with allied military services and nongovernmental organizations have embarked on various humanitarian missions to underserved areas worldwide. These missions illustrate what interoperability between nations can accomplish. Dermatologists involved with humanitarian missions encounter many conditions rarely seen in developed countries and learn to practice general dermatology with limited resources in austere environments.

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Continuing America's long-standing tradition of helping individuals in need, the US military has begun to focus on creating stronger partnerships with underprivileged areas worldwide. To accomplish this goal, the military recently has embarked on various humanitarian civic assistance missions to multiple countries in the Asia Pacific and Oceania regions as well as in the Caribbean and Latin America.

Hospital Ships Deliver Healthcare

The idea of employing military personnel to undertake humanitarian and peacekeeping projects is not new. In fact, the United States is the world's largest contributor of military aid. In 2006 alone the US military participated in approximately 556 humanitarian projects in 99 countries that included providing daily ration

packages to displaced personnel, responding to multiple natural disasters, and reinitiating proactive large scale humanitarian civic assistance missions.¹ The latter mission utilized hospital ships as well as US Navy gray-hulled vessels to deliver healthcare on a larger scale. Hospital ships are unique platforms because they serve as self-contained floating healthcare systems. Currently the navy has 2 hospital ships—the US Naval Ship (USNS) Mercy (T-AH 19) and USNS Comfort (T-AH 20)—run by the Military Sealift Command's civil service mariners. Originally oil supertankers, these 894-ft ships were converted to hospital ships in the late 1980s (Figure 1). Although they were designed to provide emergency on-site care for deployed US combatant forces, they also have been used to lend humanitarian aid and assist in disaster relief. Each ship holds approximately 1000 hospital and support staff, a receiving area with 50 beds, 1000 hospital beds, 12 standard operating rooms, and 100 critical care beds. The ships have a full radiology department inclusive of computerized axial tomography, physical therapy, optometry, and dental equipment; a well-stocked pharmacy; and a complete laboratory with a pathology department and blood bank.

Goals and Obstacles of Humanitarian Missions

These humanitarian missions serve as a coordinated effort between various US military services, allied military members, and nongovernmental organizations who work in conjunction with the host nation's healthcare members (Table 1). The missions are designed to build bridges between foreign nations and form partnerships with a common goal of improving healthcare in these regions, which illustrates what interoperability between nations can accomplish. The medical complement includes a robust medical team composed of various subspecialties that provide a range of services ashore as well as aboard the ship,

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Figure 1. United States Naval Ship Mercy.

such as public health training, medicine (eg, internal medicine, neonatology, pediatrics, dermatology, infectious disease, cardiology, nephrology, preventive medicine), and surgery (eg, general surgery, plastic surgery, pediatric surgery, urology, otolaryngology, gynecology, ophthalmology, orthopedics), as well as dental, optometry, and veterinary services. Another component of the mission is to help revive the region's infrastructure by utilizing the military's mobile construction battalions.

Although these missions provide much needed healthcare to the regions served, various obstacles

can be encountered, such as maintaining impartiality about assorted political issues; overcoming language barriers; and recognizing and respecting the local customs, beliefs, and traditional medicine.² Additional logistic problems include obtaining access to remote areas and identifying appropriate healthcare issues that can be addressed during a short stay. Utilizing the military is beneficial to provide diverse resources and technical expertise, as well as move equipment, supplies, and people quickly and effectively using various modes of transportation.

Medical and Dental Civil Action Projects

In addition to medical care onboard the ships, small contingents are sent to remote austere locations onshore. The small groups, referred to as medical and dental civil action projects (MEDCAPs), consist of 30 to 100 personnel who offer basic medical, dental, and optometry care to adults and children; perform minor surgical procedures; and provide vaccines, medications, and vitamins. Typically each MEDCAP stays in one location up to a few days utilizing tents, schoolhouses, or existing healthcare facilities. Approximately 1000 patients are seen each day; some have common illnesses or serious medical issues, while others simply come out of curiosity.

Healthcare Problems in Underprivileged Areas

The main issues underlying many healthcare problems are lack of clean water, inadequate sanitation, and poverty. It is essential for healthcare providers to be aware of endemic medical conditions, not only to avoid misdiagnoses but also to recognize potentially fatal conditions. In many areas the local people

Table 1.

Participants on Prior Humanitarian Civic Assistance Missions

- US military services: Air Force, Army, Navy, and Public Health Service
- Allied military members: Australia, Bangladesh, Canada, Chile, India, Indonesia, Japan, Malaysia, New Zealand, Papua New Guinea, Philippines, Portugal, Republic of Korea, Singapore, Spain
- Nongovernmental organizations: Aloha Medical Mission; East Meets West Foundation; International Relief Team; Operation Smile; Project HOPE; Save the Children; Tzu Chi Foundation; University of California, San Diego, Pre-dental Society

live by subsistence farming or earn less than \$2 per day.³ Often the total caloric intake is adequate, but protein consumption is insufficient; therefore, it is not uncommon to see children with reddish hair, distended abdomens, and dry flaky skin, which are signs of kwashiorkor. In other children total caloric needs are not met and marasmus is more common. Vitamin deficiencies also are seen. Occasionally a child presents at a MEDCAP for a medical problem but then reports difficulty seeing at night and dry eyes—the first signs of vitamin A deficiency. If a healthcare provider fails to recognize the aforementioned condition, children not only have an increased risk for developing infections and are especially at risk for increased complications and mortality if they contract measles but also have a risk for developing permanent blindness.

Another nutrition issue is goiter, which is attributed to a low iodine diet and increased consumption of goitrogenic foods such as cassava. Cassava, a starchy tuber, is a main staple in many developing countries. Although it provides a good source of calories, it is low in protein and contains thiocyanate, which interferes with accumulation of thyroid iodide and results in elevated thyroid-stimulating hormone levels and thyroid gland enlargement.⁴ Most patients are euthyroid but have a markedly enlarged thyroid; however, thyrotoxicosis or Graves disease also is encountered.

Although most patients have general medical or surgical problems, a variety of dermatologic conditions also are encountered (Table 2). Because resources are limited, lesion morphology and clinical acumen are the main means of diagnosis. Undoubtedly, infections are the most common dermatologic ailment. The frequency and type of infection varies, but impetigo, abscesses, scabies, and superficial fungal infections are most common. Many cases of impetigo or abscesses in young children occur because of poor hygiene and chronic persistent scabies infections. The main obstacle in treating scabies is that in most regions the living conditions are substandard. In many areas, up to 10 people share a one-bedroom dwelling; hence, unless the entire family is treated, the infection simply recurs. Moreover, even if the entire household is treated, extended family members often are infected, which simply perpetuates the infectious cycle. Other problems encountered are difficulty communicating the permethrin treatment regimen and lack of clean water to remove the medication.

Tinea versicolor is by far the most frequent superficial fungal infection encountered, yet it is rarely treated because of its high recurrence rate and relative low morbidity. Tinea corporis and capitis also have been seen but less frequently than tinea

Table 2.

Dermatologic Conditions Encountered on Prior Humanitarian Missions

- Autoimmune and inflammatory disorders: acne, alopecia areata, contact dermatitis, eczema, hidradenitis suppurativa, lichen amyloidosis, lupus, psoriasis, scleroderma, vesiculobullous disorders, vitiligo
- Congenital defects: cleft palate and lip, club-foot, congenital heart disease
- Genetic and congenital disorders: ectodermal dysplasia, epidermal nevi, hemangiomas, ichthyosis, Ito nevus, Kindler syndrome, Klippel-Trenaunay-Weber syndrome, hereditary multiple trichoepithelioma, neurofibromatosis type 1, Ota nevus, Proteus syndrome, vascular malformations, xeroderma pigmentosum
- Malnutrition: kwashiorkor, marasmus, various vitamin deficiencies
- Minor surgeries performed: fibroepithelial polyps, ganglion cysts, incision and drainage of abscesses, limited cutaneous malignancies, lipomas, removal of epidermal cysts
- Neoplasms: adnexal tumors, basal cell carcinoma, melanoma, squamous cell carcinoma
- Routine infections: abscesses, chickenpox, herpes, human immunodeficiency virus, impetigo, molluscum, scabies, tinea (capitis, versicolor, corporis), varicella-zoster virus
- Trauma: bullet wounds, burns from kerosene stoves, cuts from machetes
- Tropical diseases (Latin America): Chagas disease, leishmaniasis, onchocerciasis
- Tropical diseases (Southeast Asia): Buruli ulcers, deep fungal infections, dengue, leprosy, lymphatic filariasis, tinea imbricata, tuberculosis (primary cutaneous, scrofuloderma, Pott abscess), white piedra, yaws

versicolor. In Papua New Guinea many indigenous people have tinea imbricata (Figure 2), which is believed to occur because of a genetic predisposition combined with poor hygiene, environmental conditions, nutritional status, and an altered immune system.⁵ Other tropical infections rarely seen stateside



Figure 2. A classic case of tinea imbricata with multiple adjacent concentric plaques.



Figure 3. Annular lesions of secondary yaws.

but common in the South Pacific are yaws (Figure 3) and leprosy.

The most common infection that has the highest morbidity and mortality is tuberculosis (TB). According to the World Health Organization, nearly 2 billion individuals (one-third of the world's population) have been exposed to *Mycobacterium tuberculosis*.⁶ Records indicate that 9.27 million new cases of TB were identified in 2007, mostly in developing countries. Despite the World Health Organization's efforts to increase the number of directly observed therapy short-course programs that provide free anti-TB medications, less than 25% of patients with TB are enrolled in these programs.⁶ Another weakness of the program is that only adults receive free medications because children are considered less infectious. Moreover, the diagnostic testing required to obtain the medications is not



Figure 4. Scrofuloderma.



Figure 5. Pott abscess on the lower left back.

free and often is beyond the means of the patient. Furthermore, the clinics frequently run out of medications. Therefore, many individuals with TB go untreated; in fact, emaciated patients with chronic

untreated TB, previously referred to as consumption, frequently are seen. Scrofuloderma (Figure 4) also was common, and occasionally primary cutaneous TB or Pott abscess was seen (Figure 5).

Dermatologic conditions other than infections also are seen but less frequently. Many dermatologic conditions are chronic and require long-term medications; therefore, because medications routinely used stateside often are unavailable and/or beyond the patient's means, knowledge of what is locally obtainable is essential. Sometimes education is the only service that can be rendered. Constraints also occur when medications are dispensed for acute conditions. For example, language barriers secondary to multiple regional dialects often make it difficult to translate the instructions for taking medications. Additionally, many individuals do not have electricity, so medications that require refrigeration cannot be dispensed. Also, because the incidence of glucose-6-phosphate dehydrogenase deficiency is increased in some regions and there is no means to test for this condition, all patients are considered at risk; therefore, medications associated with hemolysis are restricted.

In addition to providing general medical dermatologic care, dermatologists perform minor surgical procedures and identify neglected cutaneous malignancies that require general surgical intervention. Because most minor surgeries occur out in the field in less than optimal conditions with no diagnostic capabilities and limited follow-up, careful selection of the cases is warranted.

Comment

It has been a privilege to participate in several military humanitarian missions. The missions are rewarding on many levels. Not only do you help

individuals in desperate need of medical care but you also see conditions rarely encountered stateside and learn to practice general dermatology with limited resources in austere environments. For further information on these missions, please visit the Web sites for the USNS Mercy and USNS Comfort, and/or Pacific Partnership 2008 and Continuing Promise 2009. Civilians interested in participating in future US military humanitarian civic assistance missions should contact affiliated nongovernmental organizations to learn more.

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