Volunteerism and Humanitarian Efforts in Surgery

If the world were merely seductive, that would be easy.
If it were merely challenging, that would be no problem.
But I arise in the morning, torn between a desire to improve the world and a desire to enjoy the world.

E.B. White

The goal of this article is to present an overview to the surgical community of global voluntary humanitarian projects, activities, and initiatives. The target audience is general surgeons and surgical specialists with an experience or interest in this area. By no means exhaustive or complete, this information hopefully will form a base from which to expand, compare, analyze, debate, criticize, stay involved, or get involved.

Background information will be presented in the realm of globalization and will provide a broad framework from which to establish the concepts, role, and opportunities for volunteerism for humanitarian activity (Table 1). The United States and other developed nations, along with the United Nations (UN) and subordinate agencies, are working through a myriad of initiatives to address the specific area of health care. The Millennium Development Goals (MDGs) address the primordial causes of most health problems—poverty, as well as specific diseases, and health areas such as maternal and child health (Table 2).

Given the recent interest on the part of the American College of Surgeons (ACS), the response to a volunteer questionnaire by the ACS, and the burgeoning body of anecdotal reports on global humanitarian surgical experiences in the *Bulletin* of the ACS,[15] it seemed logical and prudent to try to compile an overview to educate, satisfy, and entice the surgical community. The information presented in this monograph will be meaningful and interesting to those with a past, present, or future interest or experience in this area. Since the author has been involved with global humanitarian effects in cardiothoracic surgery, the information may be

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TABLE 1. Developmental indicators*

Developmental indicators	High-income countries	Middle-income countries	Low-income countries
Life expectancy (yr)	77	61	51
Infant mortality (per 1000 live births)	7	68	108
GNP ($)	25,700	1890	350
Population growth (average annual %)	0.7	1.3	2.1
Access to health services (%)	100	80	51
Government support for health (% of GNP)	14	4	5

*Health Volunteers Overseas: www.hvousa.org/sq.cfm. Data from World Bank 1998/1999 World Development Report; UNICEF's 1996 World's Children and 1999 State of the World's Children.

TABLE 2. Millennium Development Goals

1. Reduce extreme poverty and hunger by one half relative to 1990
2. Achieve universal primary education
3. Promote gender equality and empowerment of women
4. Reduce child mortality by two thirds relative to 1990
5. Improve maternal health, including reducing maternal mortality by three quarters relative to 1990
6. Prevent the spread of HIV/AIDS, malaria, and other diseases
7. Ensure environmental sustainability
8. Develop a global partnership for development

Sachs JD, Mc Arthur JW. The Millennium Project: a plan for meeting the Millennium Development Goals. Lancet 2005;365:347-53.

somewhat biased to that area, but nonetheless applicable to all of surgery and the surgical specialties. Similarly, a balance between subjective and objective thought has been a distinct challenge.

Background

The universe we occupy and time itself came into existence around 13 billion years ago, as proposed by the big bang theory.[18] The universe is composed of galaxies. The galaxies (eg, the Milky Way) have several solar systems. Our solar system is composed of the sun and the revolving planets, of which the earth is one. The diameter of the Milky Way is 100,000 light years (a light year is the distance [6 trillion miles] that light, speeding at 186,300 miles/s, travels in 1 year [http://www.pbs.org/wnet/hawking/html/home.html]). The planet earth appeared approximately 4.55 billion years ago. However, only in 1543 AD did Nicolas Copernicus

place the sun and not the planet earth as the center of the solar system. This created a period of theological and psychological turmoil to many at the time, given that now the earth and human life were no longer at the epicenter of all universal events. Thus, the Ptolemaic system gave way to the Copernican system.[18] Early man (homo habilis) appeared around 2.5 million years ago, with modern man (homo sapiens) beginning migratory patterns around 60,000 years ago. With Africa as the start, migration proceeded to Australia (50,000 years ago), the Middle East (45,000 years ago), Asia (40,000 years ago), Europe (35,000 years ago), and the Americas (15,000 years ago).[19] Globalization had an early start. The societal evolution from hunter/gatherers, to farmers/domestication, to industrial revolution, and now to technological/informational/service has been a dynamic event. More than 105 billion people have lived on the planet, with more than 6.5 billion occupying the planet at the present time. The annual growth rate is 1.14%, or more than 70 million. By 2020 the world population will reach 7.5 billion and by 2050, 9.3 billion. This comes about with a declining birth rate from 2.2% in 1963 to 1.3% in 1999. This growth is concentrated in Asia and Africa.[20] We live in 268 nations, dependent areas, territories, and miscellaneous areas (191 in the United Nations). This population occupies 29% of the planet (total surface 510.072 million square kilometers), the rest being covered with water.[21]

We share this planet with organic/living things and nonliving/inorganic elements. Together, we live and exist in the environment that we, as humans, have a lot to do with, in terms of control and effect. Any review or discussion regarding human beings and the world revolves around 5 or more general headings: environmental/geographic; political/military; economic; demographics; and social (so the mnemonic SPEED). Major elements pertinent to our discussion will be drawn from these 5 areas. The Worldwatch Institute (www.worldwatch.org) publishes several books and periodicals related to SPEED. By no means exhaustive, these trends have both a direct and an indirect bearing on healthcare issues.

Environment/Geographic Considerations

It is clear that environmental changes have had a major impact on the planet, especially with the onset of the Industrial Age in the 19th century. Global warming is real. Greenhouse-gas emissions (GGEs) are composed of natural gases (eg, water vapor, carbon dioxide, methane, and nitrous oxide) and human-made gases, especially carbon dioxide (eg, aerosols, fossil fuel combustion, and industrial processes).[22] Over the past 20 years more than 75% of carbon dioxide emissions have come from burning

fossil fuels. These GGEs are found in the earth atmosphere and allow sunlight free access to the earth's atmosphere. Some of this sunlight is reflected back to space as infrared radiation (heat). GGEs absorb and trap this sunlight. This upsets the balance of heat emitted by the sun and reflected back, thus causing a rise in global temperature. It is estimated that global temperature may rise in the range of 1.9°C to 11.5°C by the end of the 21st century.[23] Recent information from Greenland reveals that the ice sheet discharge accelerated from 90 to 220 cubic kilometers per year over the past decade.[24] Additionally, the displacement of ozone by these gases, which reflect the harmful ultraviolet sunlight, can have potential harmful effects on health, particularly with its effect on DNA.

The subsequent effect on humans and ecological structure are numerous. The potential health effects have been well studied, and continue to evoke debate and controversy. As early as 1989, Leaf[25] warned of the consequences of global climate change. These included rising temperatures with subsequent heat stress, as witnessed recently in France. Ultraviolet light (200-400 nm) is divided into 3 categories: A, B, C. DNA and the aromatic amino acids absorb all 3: A>B>C. Skin cancers, cataracts, and depression of immune systems are directly related to these ultraviolet effects. Leaf[25] further cites the 1989 World Commission on Environment and Development of the United Nations:

When the century began, neither human numbers nor technology had the power radically to alter planetary systems. As the century closes, not only do vastly increased human numbers and their activities have that power, but major, unintended changes are occurring in the atmosphere, in soils, in waters, among plants and animals, and in the relationships among all of these. The rate of change is outstripping the ability of scientific disciplines and our capabilities to assess and advise. It is frustrating the attempts of political and economic institutions, which evolved in a different, more fragmented world, to adapt and cope.

In 1993, Haines and colleagues[26] summarized a series of 11 articles in *The Lancet* regarding the impact on health of global environmental changes. Increased atmospheric temperatures have a direct effect on elderly people, especially those with cardiovascular and cerebrovascular disease, as well as pulmonary diseases such as asthma. Indirect effects occur with vector-borne diseases, and crop production. At another level, famine and drought promote further problems with migration and conflicts arising from diminishing fresh water sources. These changes are insidious and the direct connection between ecological changes or damage and health still remains unclear and debatable.

Climate changes have had predictable and nonpredictable dire consequences. Some have been chronic and lingering, such as El Niño and drought, whereas others are acute and self-limited, such as heat waves, hurricanes, tornadoes, floods, and fires. The human effects of subsequent famine, poverty, uncertainty, and loss of hope are immeasurable.

The UN Millennium Project Task Force recognizes the environment as a necessary component of human health and well-being.[8] Regulation of the quantity and quality of water, decreasing soil erosion, erosion of natural resources such as trees, control of vectors and interspecies transfer of diseases, climatic control of water/air pollution, and GGEs are all on the agenda. The accelerated increase of old diseases such as tuberculosis, and the emergence of virulent zoonotic disease such as severe acute respiratory syndrome (SARS) and Lyme disease, are natural consequences of environmental changes and the imbalance within ecosystems. It is estimated that indoor and urban air pollution with subsequent acute respiratory infection contributes to more than 2 million global deaths per year. Unfortunately, the Kyoto Protocol, which aims to decrease GGEs to 5% by 2008 to 2012 has not been officially initiated (the United States is still deliberating on final approval/participation).[23]

Hartmann,[27] in his provocative book, *The Last Hours of Ancient Sunlight,* highlights the dangers of fossil fuels, and the subsequent sequelae of the exhaustion of fossil fuels, particularly the effect on global warming. He warns of the danger of a new ice age with the effects of global warming on the balance of the Coriolis effect or the spin of the earth and the Great Conveyer Belt or the flow of warm surface water from the equator to the northern regions. The warm, less salty water grows cool and more salty, sinking to form an exiting deep sea river, with the Great Conveyer Belt pushing the warmer water north again. With global warming the northern component is threatened, thereby decreasing the "belt" and making it colder in the northern hemispheres, particularly in North America and Europe.[27] The dire health effects now seen will be compounded by the global economic/political struggles that will emerge relating to the cost and competition for these diminishing fossil fuel resources. Even now, nuclear energy is making a comeback, especially in emerging economies such as India.

Insofar as voluntary efforts are concerned, it is wise and prudent to have a basic knowledge of geography and the environment. The major climates include altitude, dry heat, cold, tropical, maritime (terrain with direct access to water), and temperate. The terrain or location is important as well. The majority of voluntary efforts are in areas hovering around the equator or in warmer climates, since these are the areas most affected by

TABLE 3. Governments*

Democracy
Multiparty (e.g., USA)
Limited (e.g., most African states)
Communist states (e.g., North Korea, China, Cuba, Vietnam)
Authoritarian regimes
Military Junta (e.g., Pakistan)
Single party state
Autocracy
Traditional Monarchy (e.g., Monaco)
Unclassified
No self-government (colonies; dependencies)
No government (anarchy; feudalism; tribalism)

*http://users.erols.com/mwhite 28/20c-govt.htm; http://users.erols.com/mwhite 28/othergov.htm.

environmental fluctuations and changes. The equator is tragically the epicenter of the poverty belt. Working in a tropical climate demands attention to seasonal changes (eg, rainy seasons and hurricane seasons). Working in high altitude or cold climates must allow for acclimatization and avoidance of winter seasons. Maritime areas are of concern, especially insofar as water-borne diseases are concerned. Hot weather, dry or tropical, requires insight into the seasonal variations of native or local healthcare activity and the incidence of communicable diseases. Adjustment to terrain is extremely important, insofar as access to the site, or mobility within the site or the area served. Air, sea/river/lake, ground transportation of people, equipment, supplies are logistical considerations that must be addressed. Tragically, many injuries and deaths of volunteers occur during local travel accidents. Attention to climate, terrain, and access are, therefore, vital concerns.

Politics/Governance

Knowledge of the political or governmental structure of any country is basic to global voluntary efforts. Local governments can be a help or hindrance, or both. "All politics are local," as Tip O'Neil once said.[28] Visas, customs, security, accessibility to government-sponsored health systems or structure are all controlled by the local and central governments. There are many classifications of government, but a useful one is summarized in Table 3. It is governments and politics that build the structure and system and provide order and security. Yet it is the individual people who make it inhabitable and livable. Clear examples of an imbalance of both sides are Haiti, where there is no consistent or stable government or system, and Sierra Leone, where the people or groups of

people have disrupted the country because of individual greed, corruption, or tribal strife, and live in a state of continued, chronic civil war/strife.

Political systems are divided into the social and individual components (http://dspace.dial.pipex.com/town/street/pl38/sect2.htm). Social systems include: autocracy/dictatorship/despotism; communism; conservatism; democracy; fascism; imperialism; monarchy; pluralism; plutocracy; socialism; and theocracy. Individual systems or personal politics include: anarchism/nihilism; liberalism; libertarianism; objectivism; capitalism; and republicanism. In general, there are 3 fears of government: kings fear violence, theocrats fear God, and feudal lords fear poverty.

Political systems parallel the evolution of human society. Some, such as Karl Marx, feel that this evolution is predetermined and does not regress to a previous stage.[29] The stages include the tribal stage, which is a collective ownership stage, and the products of labor are collected and distributed in an equal manner. Many African countries were divided along arbitrary political and geographic lines, without consideration of the various tribes involved. Nigeria is a prime example of many tribes, where the primary allegiance is to the tribe and not the country. The colonial powers took advantage of this, in favoring certain powers to their own selfish purposes and agenda. Dire consequences have arisen, as witnessed in the genocide activity in Rwanda, Burundi, and the Sudan. The next stage is the feudal society or the monarchy stage, where everything, including land and production, is owned by the monarch. Theocratic societal systems fit in here, where the dominant religious group controls the society. The Italian Papal states and the more recent Muslim regimes, such as Iran, are notable examples. The capitalist stage is marked by private ownership—individuals, government, or corporate. Socialism and communism are a blend of the stages, where both production and ownership are shared. So, in summary, the stages or systems are composed of the method of production—slave, tribal, feudal, capitalist, and the ownership—private or collective.[29]

Probably the greatest challenge/problem with regard to voluntary efforts is the myriad of governmental structures including: bureaucracy; lack of strategic/organizational or tactical/managerial structure; corruption; nepotism; and fiscal mismanagement. No matter what the level of voluntary activity, governments are involved—local, central, or both. It is important to know the governmental/political structure of a given country to better understand how the healthcare component is managed. In most emerging countries, it is the Minister of Health and the associated bureaucracy that controls and dictates policies and financial expenditures. Fortunately or

unfortunately, people compose governments, so the ego or human factor becomes an integral part of the process. Developing relationships with strategic and tactical partnerships becomes central and crucial to any effect—short-, mid-, or long-term in any country. Knowing who controls and manages healthcare policies and directives is an important aspect of voluntary activity. As an example, the 46th meeting of the PanAmerican Health Organization's (PAHO) Directing Council, in September 2005, brought together all of the health ministers from the Western hemisphere, including the United States, to discuss mutual health interests, particularly natural disasters, infectious diseases, and, in particular, the endemic/epidemic effects of emerging virulent strains of avian influenza virus (http://www.paho.org/English/DD/PIN/ptoday07_nov05.htm). Sustained political relationships evolve from friendship, understanding, compromise, and, most of all, trust.

Economics

Wealth is evidently not the good we are seeking, for it is merely useful for the sake of something.

Aristotle

The world economy (composed of 268 nations/dependencies) is huge, with an estimated gross world product (GWP) of $51.48 trillion and an average annual growth of 3.7%.[30] The old Italian proverb "without money the saints don't perform miracles" (senza soldi is nati non fanno miracoli) is certainly true when it comes to global humanitarian efforts. Taken as a single country, the United States has the largest economy (more than one third of the GWP), having grown to a gross domestic product (GDP) of $10,948.6 billion in 2005, compared with $7903 billion in 1998.[30] The United States spends 14.9% of this GDP on domestic health care, having doubled since 1970[31,32] (Fig 1). The 24% of the population living on less than $1 per day has not changed dramatically. Surprisingly U.S. health care is ranked 37th in the world, according to a World Health Organization (WHO) analysis.[33] This report makes a convincing argument that, in addition to the delivery of high quality services, health systems must also protect its citizens from the financial burden of disease and illnesses, and meet their expectations in terms of dignified care.[33] One would think it would rank first by any set of criteria used for analysis. The recent meeting of the G8 targeted foreign aid at 0.7% of GDP. This is a continuation of the Monterrey Consensus.[34-36] Through 2003 $27 billion, or 0.1% of the target 0.7%, has been reached; $18 billion of this aid is for technical assistance. U.S. foreign aid is

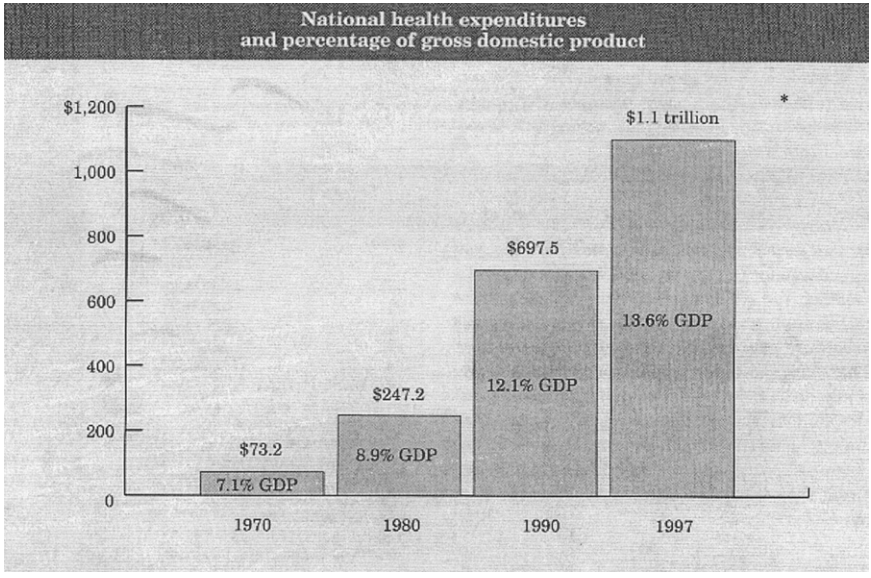

FIG 1. National health expenditures.[31,32]

primarily administered by the U.S. Agency for International Development (http://www.usaid.gov/). The Global Health Council (GHC) (www.globalhealth.org), the major global health lobby agency in Washington, DC, tracks U.S. global health policy and funding.

With regard to overall voluntary/humanitarian global healthcare funding, the major sources are the multilateral United Nations (UN) and related agencies[37] (Table 4), as well as bilateral sources such as the United States. Nongovernmental organizations (NGOs) and private funding complete the income sources and will be discussed further in the text. Seeking supporting financial funds for voluntary humanitarian healthcare initiatives is a major challenge, given the increasing demand and the unbalanced supply.

Demographics

Demographics or demography is the study of human populations dynamics.[38] The structure, distribution, and change of population over time are the core essentials of demography. Associated areas of education, nationality, language, religion, culture, and ethnicity are also related to demographic study. It is worth noting that the crude world population continues to rise, despite a decreased percentage of growth. Most all

TABLE 4. Major international UN health-related organizations

- World Health Organization (WHO)
- World Bank
- UN Children's Fund (UNICEF)
- UN Population Fund (UNFPA)
- UN Development Program (UNDP)
- UN Educational, Scientific and Cultural Organization (UNESCO)
- Food and Agriculture Organization (FAO)
- World Food Program
- UN High Commissioner for Refugees (UNHCR)
- International Labor Organization
- UN Fund for Drug Abuse Control
- World Trade Organization (WTO)

(99%) of the global population increase (the difference between numbers of births and number of deaths) occurs in the emerging economics of Africa, Asia, and Latin America. The demographic transition model helps to explain the transition from high birth and death rates to low births and death rates.[38] There are 3 stages. Stage I occurred before the Industrial Revolution when agriculture required more farm workers. More children were required to work the farms, and the death rate was higher in children. Here, birth and death rates remained stable, Stage II saw improvements in sanitation and health care in the mid-18th century. Death rates decreased, but stable birth rates saw increased populations. Emerging economics or less developed countries remain in this stage, thus forming the disproportionate global population growth. Stage III in the late 20th century saw stable birth and death rates in developed countries. This world population growth is placed in perspective[25] (Fig 2).

Despite the global increase in overall population, the rate of growth is slowing. Although the 1994 Cairo International Conference on Population and Development did not achieve its primary goal of increased contraception modalities, the global rate of growth has decreased from the historic high of 2%, except in the least developed countries[39,40] (Fig 3).

Another phenomenon of population growth is the increase in life expectancy. The global life expectancy is more than 66 years.[42] A person born today will live more than 20 years longer than 50 years ago. Japan has the highest median age (age at which there are an equal number of people older and younger) of 42.9 years. Uganda has the lowest median age, at 14.8 years.[30,41]

As a component of demographics, epidemiology is concerned with the study of occurrence of disease in populations, including both communicable and noncommunicable forms. The 3 types of epidemiology are

World population growth [25]

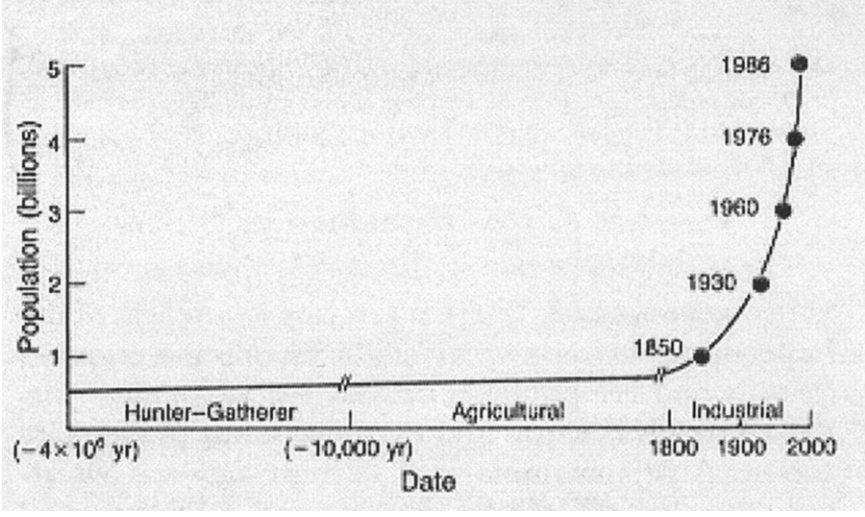

FIG 2. World population growth.

descriptive, which studies incidence and prevalence; analytic or causative, which studies the root cause of disease, using cross-sectional, prospective or cohort, or retrospective/case control methodologies; and experimental, which involves clinical trials.[42,43]

The focus on communicable or infectious disease in developing countries is understandable, since 26.8% of deaths in developing countries are due to leading infectious diseases, as compared with 3.5% in developed countries.[42,43] Yet there is emerging emphasis on noncommunicable acquired chronic diseases, including cardiovascular, cerebrovascular, diabetes mellitus, trauma, and mental health problems, especially since they are increasing at staggering rates in developing countries.

Of major concern to all healthcare workers is the number and causes of death and morbidity or disability globally. The landmark work in this area was a series of 4 reports published in *The Lancet* by C.J.L. Murray and Alan D. Lopez.[44-47] They also introduced and employed the standard unit, DALY, to help comparisons for disability and length of life (DALYs are the sum of life years lost due to premature mortality and years lived with disability adjusted for severity).[44,46] The total deaths for 2002 were 57,029 million.[48] Of interest to cardiothoracic surgeons are those deaths related to ischemic heart disease (>6.8 million), tuberculosis (>1.6

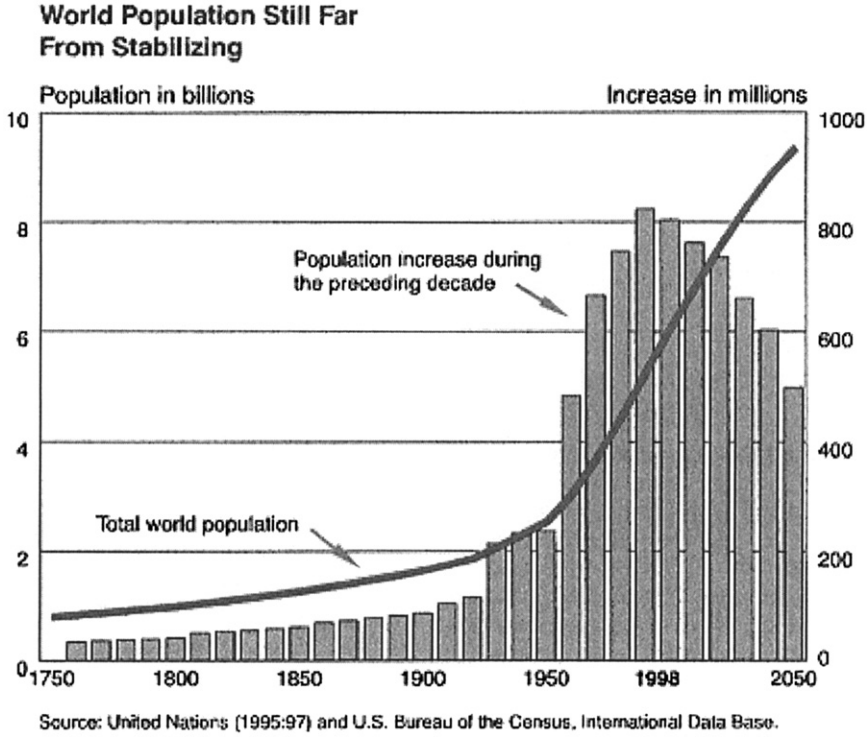

FIG 3. World population still far from stabilizing.

million), road traffic accidents (>1.2 million), thoracic malignancies (>1.2 million), rheumatic heart disease (>480,000), and congenital heart anomalies (>280,000).[48] The sobering fact is that the incidence of chronic diseases is increasing, especially in emerging economies[49] (Table 5). The correlation of income and chronic disease has emerged as a major health hazard. Unfortunately, the millennium development goals do not focus on this growing problem/challenge of chronic diseases.[50]

The global burden of cardiovascular disease is borne out by more than 11 million annual deaths from cardiovascular (CVD) and cerebrovascular diseases. An epidemiological discussion that encompasses demographics has been outlined by Gaziano.[51] The basic facts are that CVD accounted for 10% of all deaths at the dawn of the 20th century, and at the dusk of the 20th century economics accounts for 50% of deaths in developed countries and 25% of deaths in emerging economics. The pattern shows a dramatic increase in CVD in emerging countries as the 21st century progresses. Parallel economic, social, and demographic changes follow

TABLE 5. Current and projected burden of chronic and infectious diseases and injuries in selected countries and regions[49]

	Percent of disability adjusted life years (DALYs)	
	1990	**2020**
All developing countries		
Chronic diseases	36	57
Infectious diseases	48	22
Injuries	15	21
Latin America		
Chronic diseases	48	68
Infectious diseases	35	13
Injuries	16	19
China		
Chronic diseases	58	79
Infectious diseases	24	4
Injuries	18	16
India		
Chronic diseases	29	56
Infectious diseases	56	24
Injuries	15	19

along with this transition concept. The economic changes include industrialization, globalization, and urbanization. Social changes are primarily diet and activity changes. Demographic transition, alluded to earlier, changes not only the balance of birth and death rates, but rising age rates, with subsequent emergence of more chronic diseases.

Social/Culture

A.H. Maslow, the noted social psychologist, addressed the 5 basic needs of the individual in a societal structure.[52] They include physiological or basic health issues, safety or security for self and family, belongingness and love, self-esteem for one's life and goals, and self-actualization or the reaffirmation of not only what we can be, but must be—a sort of individual or collective destiny concept. Social aspects encompass culture, customs, lifestyle, education, and health. All 4 impact on health. Unfortunately education and healthcare issues remain low on the budgets of many countries. The reasons are vague to many and clear to others. The percentage of GDP allocated to health gives some guarantee to quantity of care, but not necessarily quality of care. The example of the United States has already been given. The UN has been the major force in addressing global health issues via the WHO. During the UN Millennium Summit in 2000 targeted goals for the year 2015 were established[7] (Table

TABLE 6. Examples of quick wins in the health sector[7]

- The training of large numbers of village workers in health, farming, and infrastructure (in 1 year) to ensure basic expertise and services in rural communities
- Distribution of free, long-lasting, insecticide-treated bednets to all children in malaria-endemic zones to decisively cut the burden of malaria
- Elimination of user fees for basic health services in all developing countries, financed by increased domestic and donor resources for health
- Expansion of access to sexual and reproductive health, including family planning and contraceptive information and services, by closing existing funding gaps on contraceptive supplies, family planning, and logistics
- Expansion of the use of proven effective drug combinations for AIDS, tuberculosis, and malaria, especially in places where infrastructure already exists but finance is lacking

2). The directly related health issues are maternal health and mortality, child mortality, and communicable diseases. Unfortunately chronic diseases, which are the largest cause of death and DALYs, as already pointed out, are not addressed.[50] Sachs and colleagues[7] have proposed easily achievable goals using existing, inexpensive means and technology (Table 6).

Of particular concern to volunteer groups are the health inequalities both within and between countries. For example, white men in the 10 "healthiest" counties of the United States have a life expectancy of 76.4 years compared with an average of 60 years for black men in the 10 "least healthy" counties of United States.[53] This gap is different from between countries, which can range from 30 to 40 years. There is a 34-year gap between Sierra Leone, the lowest life expectancy, and Japan, at 81.9 years, the longest life-expectancy country.[23,54] In the United States, education, crime, income levels, hopelessness, and other social issues contribute to increased incidences of homicide, circulatory diseases, and human immunodeficiency virus (HIV) infections. In emerging economies or developing countries, the root causes of communicable diseases are poverty, starvation, contaminated water, and sanitation.

Marmot cites Geoffrey Rose coining the term "causes of causes."[54] This implies looking at the root social causes of, in particular, noncommunicable diseases. Unhealthy behavior, habits, and stressful lives are the major root causes of acquired disease. The Solid Facts publication cites 10 social determinants of health[54,55] (Table 7).

The improvement of medicine may eventually prolong human life, but the improvement of social conditions can achieve this result more rapidly and successfully.

TABLE 7. Solid facts—social causes[54,55]

- The social gradient—haves/have not
- Stress—especially urban life
- Early life
- Social exclusion
- Work—boredom; lack of fulfillment
- Unemployment
- Social support
- Addiction
- Food—poverty
- Transport

If it is thus agreed that the major causes of disease and the initiatives of health care are rooted in social conditions, then this adds more validity to the MDGs and the elimination of healthcare disparities worldwide.

In 1948, the UN Office of the High Commission for Human Rights (OHCHR) proclaimed the Universal Declaration of Human Rights.[56] These 30 articles specified the global social contract of all countries with its citizens. Article 25 of that contract is specific regarding health care:

Everyone has the right to a standard of living adequate for the health and well-being of himself and of his family, including food, clothing, housing, and medical care and necessary social services. . . .[56]

We have a long way to go in fulfilling this contract.

It is important, valuable, and almost imperative to have insight into the social/cultural milieu of the people/country being served. As a further example, China has a rich history dating back more than 5 thousand years. Rooted in the philosophical traditions of Confucius and Lao Zi, their traditional approach to medicine has centered on prevention and symptoms treatment. Teaching and transferring Western concepts requires patience and appreciation of this background as well as their educational approaches. They proceed in an orderly way and accept new concepts and methods in a flowing way. They traditionally have absorbed foreign concepts such as Buddhism and, more recently, Western technology, assimilated, or digested and modified it, to fit their social/cultural framework. Another example is their women. Looking at the role of women in their society over the past 100 years has been dramatic: bound feet, concubine, World War II comfort women, farm laborer, factory laborer, professional roles in law, medicine, education, and business. All this was achieved without sacrificing their core values as mother, foundation, and protector of the family.

Globalization

The physical planet earth has a fixed area, yet insofar as the humans who inhabit it, it has become smaller. If predictions about global warming are correct, the land area may well shrink as well. The driving force for this diminution in size has been economics and technology, especially in the areas of communication and transportation. The 4th wave of transition from hunters/gathers to agrarian to industrial, and now technology, has transformed the world and its human population into this phenomenon of globalization. Globalization involves all aspects of SPEED. Its major effect has been in the social, political, and, especially, economic areas. It involves 2 basic processes. The first is movement and the second is integration. Movement, simply put, is shrinking the time element for the transfer of ideas, information, technology, skills, money, people, and product/goods.[30] This has been achieved primarily by the computer/Internet and the advanced forms of physical transportation—air, sea, and land. The second process or phenomenon is the integration of the elements of transfer into a global or universal structure. With the English language, with more than 1 million words, emerging as the universal language, and the ready Internet mechanisms for translation into any language, this integration will become increasingly streamlined, efficient, fluid, and rapid.

Whether we like it or not, globalization is a reality and is here to stay. Dwindling natural resources (especially fossil fuels), changing borders, emerging new countries (projected to increase from 200 to 250 over the next 30 to 40 years), the Internet, high-speed transportation, and increasing interdependence have forced us to change, share, transform, or revise our way of thinking and acting on this world stage. If viewed from just an economic and environmental point of view there should and will be increased global awareness and participation of people and countries on this planet. As noted, the GWP is $51.48 trillion, with an annual rate of growth of 3.7%.[30] More than $1.5 trillion is traded internationally each day, with more than 20% of the world production of goods and services being traded. Clearly, global economics is dependent on this world trade and production. Natural and manmade disasters have created geographic and environmental changes, especially with the increased number of refugees, migration, and the swelling of urban populations. The inescapable fact is that we cannot ignore or run away from this phenomenon of globalization.

The whole concept of globalization or interdependence is certainly not a new one. Thomas L. Friedman[57] in his book *The Lexus and the Olive*

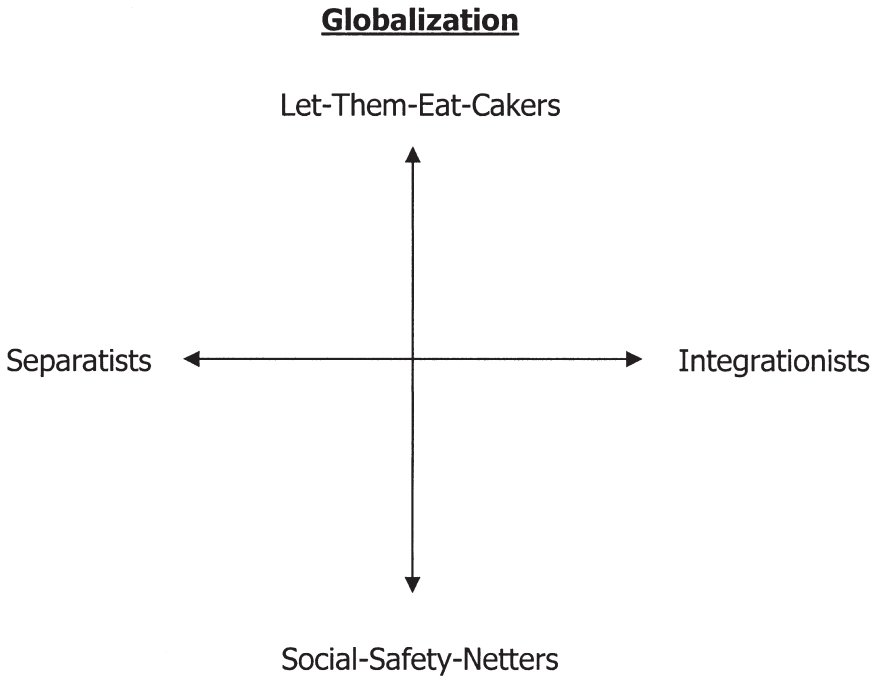

FIG 4. Globalization.

Tree, divides globalization into 3 eras. The pre-World War I era was marked by intense migration of people to other countries, particularly America, and improved transportation and communication. The second era from World War I, the Russian Revolution, the Great Depression, World War II, and through the Cold War saw no great international movement aside from almost total global destruction. The third era followed the breakdown of the Soviet system. Rapid and massive transportation, along with technology, now gives everyone an opportunity to be involved in the global marketplace.

One's own philosophical approach to being involved in this global expansion must be addressed and debated. Friedman[57] outlined 4 political identities in the globalization system (Fig 4). The horizontal line is the globalization line. Separatists reject the concept and tend toward isolationism. Integrationists welcome free trade and Internet commerce. The vertical or distribution axis represents politics and policies. Social-Safety-Netters seek widespread democracy with social safety nets. The Let-Them-Eat-Cakers is a rugged individualistic, winner-take-all approach. That means less government, taxes, and safety nets. Obviously, this

present article tends to be directed toward the integrationist/social-safety-net philosophy.

Simply put, globalization is the increasing interdependence that is emerging among the people and places of the world. No longer can we live in isolation from one another. Eventually, the impact of war, terrorism, natural disasters, financial ruin, climatic catastrophes, and disease, particularly of the endemic or epidemic variety, will affect all of us in a major or minor way.

Ultimately globalization entails a paradigm shift in the way we think about things. Hartman[27] calls this a transformation:

There is a "morphic field" wherein we are all connected, identified by Rupert Sheldrahe, and referred to by Carl Jung as the "collective unconscious," where, as we each individually begin to change our way of thinking and living, our actions echo out into the larger world.

Globalization is a challenge. As a positive challenge it represents the key to future world development. This is the perspective of the WTO, which is attempting to increase world trade by eliminating or modifying trade barriers between countries, thus increasing the free flow of produced goods and natural resources. As a negative challenge it is perceived with fear and hostility, representing a catalyst for increased inequality between countries, with benefits favoring primarily the developed, industrialized nations. Fostering this belief is a world economic outlook study that examined 42 countries representing 90% of the world population.[58] Output per capita per country rose but distribution among countries became more uneven as the 20th century progressed. Perhaps a better tool to assess this objectively is the Human Development Index (HDI). (1990 to 1991—United Nations established the Human Development Index, which includes GDP or GDP per head, adult literacy, average years of schooling, and life expectancy [scaled 0-100, with $>$80 as high, 50-79 as medium, and $<$50 as low].[30]) The lowest country HDI is Sierra Leone (27.3), the highest is Norway (95.6), and the United States is eighth at 93.9. In comparing economic considerations alone the differences remain obvious.[30]

In summing up the SPEED aspects in concert with globalization, it may be interesting to examine the global perspective and the priorities of approach. The Copenhagen Consensus was a meeting of international authorities in 2004 to discuss global issues and crises and develop prioritized solutions.[59] Targeted challenges with promising opportunities in health were only seen in communicable disease. As shown, all of the opportunities have clear indirect effects on overall global health care,

particularly climate change, which is directly related to the overuse and depletion of fossil fuels.[27]

Global Health Care

It is important to have a basic understanding of the U.S. healthcare system, since many of the emerging economies look to the United States as a model of comparison for their existing system and future changes or adjustments. Jones[60] gives a nice historical review of the U.S. healthcare system from the 17th century on into the 21st century. The accelerated phase of American health care occurred after World War II. The federal government began increased financial support for medical research, mental health, the Veterans Administration, and community hospital construction (Hill-Burton Program). The National Institutes of Health (NIH) expanded from intramural efforts in Bethesda, Maryland, to extramural funding. Pharmaceutical funding also increased. Private insurance and managed care received another partner, the federal government, with the establishment of Medicare and Medicaid in 1965. It has been managed care and the federal/state programs that have contributed to the slower acceleration of healthcare costs. In the United States today, the major healthcare concerns remain the slower but still increasing costs of health care, access to adequate care by uninsured working patients, quality assurance/outcomes, and to a lesser degree providing access and care to the poor income bracket of American society.[30,61]

It is unreasonable to assume that the global population of 6.5 billion will eventually have the same level of care as the developed nations. Even the United States, as pointed out, with more than 40 million uninsured nonelderly Americans, does not have a balanced and equitable level of health care.[61] The challenges are sobering and real. The ongoing debate between the neo-Malthusians who believe the growing world population is unsustainable, and the Technocentrists who believe that emerging technologies can and will support a rising world population, continues to evoke a sustained emotional response. (Thomas Malthus [1766-1834]—"Political economist who warned of the potential of unchecked population growth to outstrip growth of the means of subsistence. The solution lay in 'moral restraint,' for instance by postponement of marriage, which would reduce the birth rate. These fears abated during the course of the19th century but arose again in the middle of the 20th century when rates of population growth in the poorer regions of the world started to accelerate. In testimony to his enduring influence the leaders of the international family planning movement that arose in response to this population growth were often characterized as neo-Malthusians."[62]) The

Darwinian evolution theories as advanced by Herbert Spencer (originator of phrase "survival of the fittest") espoused natural selection.[20] The new school of social Darwinists have advanced the competitive survival of the fittest to include collaboration or an inclusiveness of all members of society.[20] Such is the nature of most Americans (ie, the constant struggle to achieve balance between selfishness, self-reliance, rugged individualism, justice, and altruism, humanitarianism, compassion, forgiveness). All of these were outlined in profound depth by Ralph Waldo Emerson in his Essay on Self-Reliance[63]: "Do that which is assigned you, and you cannot hope too much or dare too much." The roots of the Judeo-Christian ethic continue to run deep in American society.[13] Our European colleagues also share this goal or desire for inclusiveness. Yet it requires that the medical profession retain or regain its "moral compass." This involves public trust. Once again, trust becomes a recurring theme. To retain or regain societal trust includes the ethic of professionalism. The British Royal College of Physicians has outlined the commitments to integrity, compassion, altruism, continuous improvement, excellence, and working within a cooperative team atmosphere.[64] These values form a moral contract between the medical profession and society.

In 2003, the Trinity papers, published in *The Lancet,* summarized a conference discussing the foundations of global health and the values supporting those foundations. The justification for global health initiatives were based on the tenets of 4 major schools of moral values[65]: humanitarianism, embedded in most world religions, a philosophy of acting in a manner based on compassion, empathy, or altruism; utilitarianism, the subjective utility or happiness, pleasure gained by an individual in performing an act or service that benefits others; equity, a relational concept of ethical distribution of healthcare initiatives; rights—the notion that health care is a right. This imposes duties and obligations on those with the ability to grant and ensure those rights. This has become a dominant theme for most multilateral, bilateral efforts.

Poverty remains a central theme when discussing health care, since many of the diseases and healthcare issues are rooted in poverty. As 1 of the main goals of the MDGs, poverty remains a formidable challenge. World hunger is a direct result of poverty, whatever the root causes (eg, wars, conflicts, or natural disasters such as drought, earthquakes, and floods). More than 800 million people go to bed hungry, mostly children. The major source of donated food is the UN World Food Programme (WFP) (http://www.wfp.org/english/). From a high of 15 million tons of donated food per year in 1999, it dropped to 11 million tons in 2001. In December 2005, the WFP ended its program in China, where still 80% of

the population is considered poor. Yet China has recognized this imbalance, and at the recent meeting of the Communist Party of China, the 11th new 5-year plan called for increased aid to rural farm workers and alienated portions of Chinese society, in an effort to create a more "harmonious society."[9]

The noted economist Jeffrey Sachs, the developing force for the MDGs, has been a strong advocate for alleviating extreme poverty. Using clinical economies, he advocates continued initiatives to address the root causes of poverty (ie, polluted water, poor soil, and lack of basic health care).[7] He maintains the key to escaping poverty is increased assistance to allow basic infrastructure and human capital to be put in place. He emphasizes the use of simple technology in many initiatives (eg, mosquito nets for malaria prevention).[66] Yet once poverty is at least controlled or alleviated, staying out of poverty becomes the major issue. This involves finding a job or source of income. Globalization has helped in this area, particularly with global corporate initiatives to outsource for cheaper labor. However, this may only aggravate the Ricardo theory of the "iron law of wages." (David Ricardo (1772-1823)—Economist Iron Law of Wages, 1817 [http://cepa.newschool.edu/het/profiles/ricardo.htm] www.fordham.edu/halsall/mod/ricardo-wages.html.) This means wages can be kept at a basic minimum, since workers are infinitely available, replaceable, and interchangeable. Witness the odyssey of the tennis shoe industry from country to country as the unskilled labor force changes. Again, the theory of Malthus comes to haunt us, in that he theorizes that human misery is inescapable because populations reproduce themselves exponentially.

Public Health Initiatives

The traditional public health approach of sequential initiatives of initial control of infrastructure (eg, water, basic needs), vector control, vaccination programs, family health/planning, then progressive curative measures, does not fit the present world order. This archaic concept is somewhat analogous to the World War II concept of storming the beaches wave by wave. The modern battlefield is an integrated process. No country is totally developed/underdeveloped, or emerged/emerging. There are elements of both in each country, territory, or region.

As surgeons, we are classified as curative practitioners, in contrast to preventive medicine and public health. The focus is different: individual patients versus cohorts/populations. Hopefully the 2 will merge to work in a horizontal collaborative way to try to understand and deal with the global health issues in an integrated, practical, and cost-effective way.

TABLE 8. Differences between public health and curative medicine[69]

Public health	Curative medicine
• Primary focus on population • Public service ethic, tempered by concerns awareness for the individual • Emphasis on health promotion and disease • Reliance on many sectors outside healthcare system	• Primary focus on individual • Personal service ethic, conditioned by social responsibilities • Emphasis on diagnosis and treatment; care for the whole patient • Reliance on healthcare system

As examples, an older but useful study examined interim strategies for infectious disease control in developing countries. Looking at prevalence, mortality, and morbidity of certain infectious or communicable diseases, a priority approach was established that was cost-effective and for which there was adequate treatment or control effects.[66,67] Strategies for CVD are evolving as well. Yusuf and colleagues[70] offer some useful guidelines for this emerging epidemic disease.[68]

Let us look at the key differences between public health or preventive medicine and curative medicine[69,70] (Table 8, Fig 5). Clearly the Ghana model is not practical or cost-effective. Current thinking is evolving to a more collaborative and interactive approach.[71] The development of the horizontal approach and streaming concept is a more disease-specific approach.[72] This allows both sides of the healthcare team to prioritize their efforts and share the advantages of individualized care, triage, and population/cohort dynamics. The curative practitioner looking at the horizontal model now places his individual patient in perspective, where all aspects are considered. The public health or preventive medicine practitioner also sees how the population or cohort fits into the streaming process so all components of the healthcare system are used in a coordinated, caring, and cost-effective manner. Even in the United States, the traditional departmental systems of medical schools and medical centers are evolving into a more efficient problem-, disease-, or systems-based education, training, clinical practice, and research/development mode[73] (Fig 6). Working together this fluid approach engages and prioritizes the resources available to act in an efficient and cost-effective manner. Thus the pyramidal system as traditionally practiced is becoming obsolete, particularly in emerging economies.[72]

Financial support for all of these ambitious and creative efforts demand financial support. As a spin-off of the MDGs, the UN in 2001 established a Global Health Fund to focus on control of AIDS, tuberculosis, and

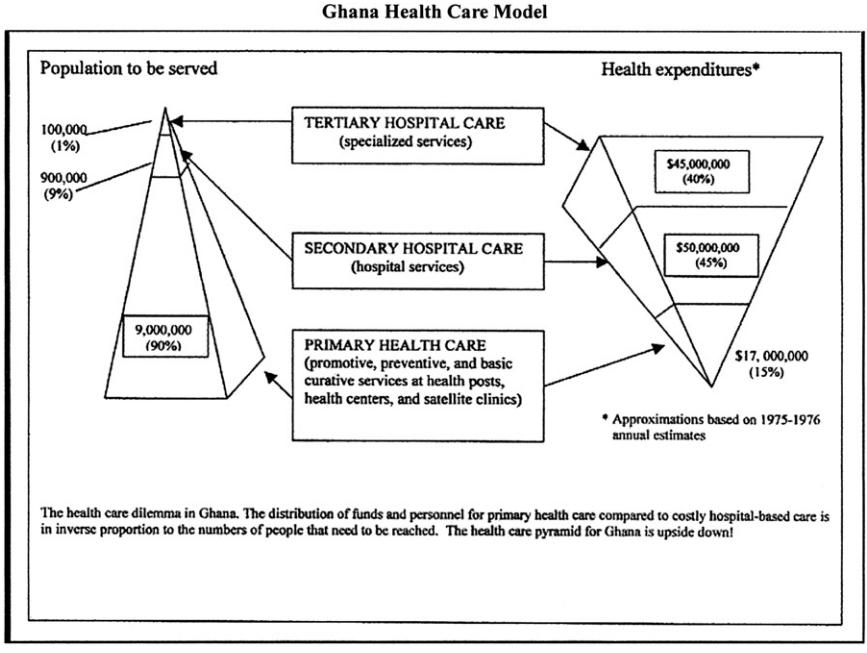

FIG 5. Ghana healthcare model.

malaria.[74] To date $3 billion has been committed to 128 countries to support aggressive interventions. A case is being made to increase the Global Fund to include maternal, neonatal, and child survival.[75]

Bilateral spending, aside from debt relief for targeted countries, and increased spending for HIV/AIDS initiatives, will not see dramatic changes. The NGOs and other charitable sources will continue to be the major source for most targeted, local health initiatives.

Philanthropy

If I can stop one heart from breaking.
I shall not live in vain;
If I can ease one life the aching,
Or cool one pain,
Or help one fainting robin
Unto his nest again,
I shall not live in vain.

Emily Dickinson

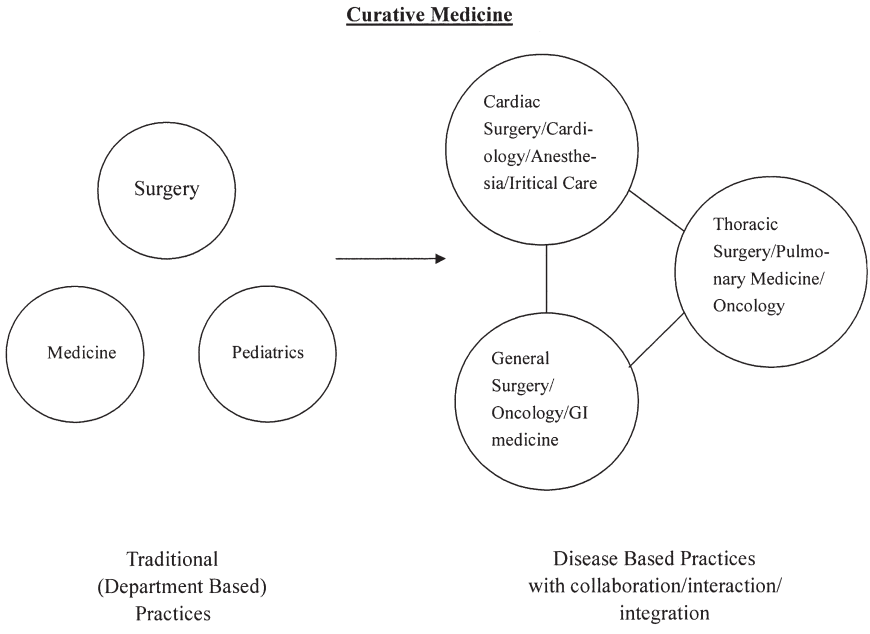

FIG 6. Curative medicine.[73]

The largest U.S. NGO foundation is the Bill Gates Foundation. His priority is summarized in an interview in Time Magazine.[76]

Question:

The foundation with your name on it has a $26 billion endowment. How do you decide who gets your money?

Answer:

"*The biggest priority is world health. And we measure that by saying. How can we save the most lives? And so, clearly, about 30 diseases jump out as needing better medicines or better delivery of medicines or vaccinations—some way of making sure these diseases are eliminated. Already, through the increased vaccination work we've done, we're well past saving a million lives*."

The Gates Foundation model is a presage of what corporate/business principles can accomplish in the macro-global sphere of health care. With an endowment fund of $26 billion, the Foundation has established a "Grand Challenges in Global Health."[77] It basically addresses technology to improve and create new vaccines, control vectors, improve nutrition,

TABLE 9. Organizations providing health care services/aid*

Multilateral agencies—All part of the United Nations, including World Health Organization (WHO)
Bilateral agencies—Individual countries. In USA, United States Agency for International Development (USAID)
Nongovernmental agencies (NGOs)—Also called Private Voluntary Organizations (PVOs). Maintain 501(c) 3 tax-exempt status and tax I.D. number with Internal Revenue Service (IRS). Are incorporated in an individual state. Over 23,000 NGOs in USA alone with international activity in 3 or more countries.

*The Major International Health Organizations—http://www.imva.org/Pages/orgbio.htm.

improve care and cure infections, and measure outcomes. This is separated out from political, social, and economic issues. It can be argued that both areas should be integrated, but that may be too complex, time-consuming, and unachievable.

Of the 50 most generous philanthropists, only 6 have targeted donations for health care.[78] Faith-based charity donations approach $81.78 billion for all causes.[79-81] Examples include the Muslim faith, which practices Inkat, 1 of the 5 pillars, with 2.5% of salary donated to charity. The Latter Day Saints (Mormons) traditionally tithe 10% of their yearly income. Charitable donations in total were $248.5 billion in 2004. In the United States charitable tax deductible donations are limited to less than 50% of adjusted gross income.

The number of NGOs (US 501[c]3-tax code) in the United States is more than 2 million[82] (Table 9). There are more than 20,000 international NGOs (ie, groups operating in at least 3 countries).[82] More than 15% of all NGOs are involved in healthcare activities. There are many categories[83] (Table 10). In some countries, such as Haiti, foreign NGOs account for more than 70% of the total healthcare delivery. Emerging economies are slowly developing NGO efforts. India and China are notable examples (www.indianngos.com/; www.fupin.org.cn/hhh/hhh.htm). As the economies grow more efforts will be seen that complement the generosity of the developed nations. In total, in 1995 the nonprofit sector in 22 of the developed countries generated and spent more than $1.1 trillion per year, far exceeding the multilateral and bilateral efforts.[82] In recent years, more attention from the multilateral, bilateral, NGO, and individual elements is being focused on the efficacy of the myriad of global humanitarian healthcare initiatives. The quantity of money spent is being challenged by accountability or getting the best value for the diminishing financial and human resources. Many governmental grants are now being administered by large NGOs. The direct government or UN aid directly to countries is being carefully scrutinized and monitored. At the frontline level, many

TABLE 10. Nongovernment organizations (NGOs)[83]

There is such a broad spectrum of NGOs that it is difficult to define them. They can be divided into 6 categories.

1. Relief and welfare agencies, including missionary societies, providing services routinely and in emergencies
2. Technical innovation organizations, which promote new or improved approaches to problems
3. Public service contractors, which are contracted by government aid agencies to perform particular activities, such as food aid
4. Popular development agencies, which are northern NGOs and their southern counterparts and focus on self-help and social development
5. Grassroots development organizations, which are locally based, southern NGOs, and may or may not receive funding from popular development agencies
6. Advocacy groups and networks, which do not necessarily have field projects, but exist primarily to educate and lobby

smaller NGOs are facing increased challenge and frustration acquiring financial support or free donated product. More documentation and accountability is being required and demanded. At the higher levels, this is also occurring. A notable example is The Ellison Institute.[84] Founded by Larry Ellison and run by Chris Murray, this Institute is committed to generating ". . . credible, comprehensible, and comparable information on health resources and services."

Volunteerism

One of the illusions (of life) is that the present hour is not the critical, decisive hour.

Ralph Waldo Emerson

A volunteer is one who freely enlists of service without payment. A more suitable definition is:

To volunteer is to act in recognition of a need, with an attitude of social responsibility without concern for monetary profit, gaining beyond what is necessary to one's physical well-being.[85]

A humanitarian is defined as:

One who is devoted to the promotion of human welfare and the advancement of social reforms; a philanthropist.[86]

Humanitarian should not be confused with humanism, which is a philosophical movement, as espoused by Corliss Lamont and others.[87] Humanism believes in a naturalistic metaphysics, drawing on nature and science. Humans can solve their own problems and shape their own

destiny. Its main goal is worldly happiness, freedom, and progress. A good life involves contributing to the life of the community, the establishment of worldwide peace, and improved living standards.

The year 2001 was designated by the United Nations as the year of the volunteer. A recent report summarized the response and results of that focused attention on volunteers.[88] Volunteer activity and humanitarian activity both at home and abroad is familiar to most Americans. In the history of the Nobel Peace prize from 1901 to 2002, 17 awardees, the highest number, have been Americans. As a country the single most dramatic example of a voluntary humanitarian effort was the Marshall Plan following the devastation of Europe after World War II. George C. Marshall, the former chairman of the military Joint Chiefs of Staff and former Secretary of State, designed and coordinated this giant relief effort[89]:

An essential part of any successful action on the part of the United States is an understanding on the part of the people of America of the character of the problem and the remedies to be applied. Political passion and prejudice should have no part. With foresight, and a willingness on the part of our people to face up to the vast responsibility that history has clearly placed on our country, the difficulties I have outlined can and will be overcome.

In 1997, President Bill Clinton commemorated the 50th Anniversary of the Marshall Plan[90]:

Our generation, like the one before us, must choose. Without the threat of Cold War, without the pain of economic ruin, without the fresh memory of World War II's slaughter, it is tempting to pursue our private agendas—to simply sit back and let history unfold. We must resist that temptation. And instead, we must set out with resolve to mold the hope of this moment into a history we can be proud of.

In the tradition of this and other humanitarian efforts or bilateral efforts by the United States, and recent multilateral efforts, as witnessed by the recent tsunami disaster that killed more than 200,000 people, volunteerism and humanitarian efforts continue throughout the world. The bipartisan collaboration of 2 former U.S. presidents is a model and example to learn from.

As with most Americans, pragmatism is an essential component of our national philosophy. William James said it best[91]:

When our thought about an object has found its rest in belief, then our

action on the subject can firmly and safely begin. Beliefs, in short, are really rules for action; and the whole function of thinking is but one step in the production of habits of action. If there were any part of a thought that made no difference in the thought's practical consequences, then that part would be no proper element of the thought's significance.

Historically, or certainly within the last 500 years, most volunteer or humanitarian efforts have been faith based, particularly from Europe, steeped in the Judeo-Christian faith and ethic.[13] The 3-fold mission of soul, body, and mind is evident in the churches, schools, and healthcare mission/facilities/hospitals started and performed throughout the years. It is in this area that the United States has earned an international reputation for volunteer humanitarian healthcare initiatives. The Presbyterian hospitals and Maryknoll mission clinics in South Korea are typical examples of that effort. Americans have continued this effort, particularly in the area of non-faith-based initiatives. Although rooted in the ethical aspects of religion, humanism is at the central core of volunteerism, and works in concert with faith-based groups. This is in stark contrast to the Machiavelli approach[92]:

. . . for a man who strives after goodness in all his acts is sure to come to win, since there are so many men who are not good. Hence it is necessary that a prince who is interested in his survival learn to be other than good, making use of this capacity or refraining from it according to need.

The utilitarians are not as bold as Machiavelli. John Stuart Mills comments[93]:

The utilitarian morality does recognize in human beings the power of sacrificing their own greatest good for the good of others. It only refuses to admit that the sacrifice is itself a good.

Americans are a unique breed. Tocqueville[94] comments on the addiction of Americans to the more practical than theoretical science:

Equality begets in man the desire of judging of everything for himself: it gives him, in all things, a taste for the tangible and the real, a contempt for tradition and for forms.

American surgeons have evolved along some of these lines. Self-discipline is probably 1 of the notable aspects of the surgical personality. This carries over into action with purpose and direction. Goals are set, attitude is adjusted and modified, and focus energy/action is on achieving the goal. Ruth Benedict, in her book *The Chrysanthemum and the Sword,*

TABLE 11. Volunteers

Google Search Sites (12/15/05)
Medical missionaries—1,840,000 hits (sites)
Humanitarian medical—11,800,000
Volunteer medical work—25,700,000
Volunteer surgery—5,050,000

which tries to define Japanese culture and philosophy, summarizes the American self-discipline approach[95]:

The American assumption is that a man, having sized up what is possible in his personal life, will discipline himself, if that is necessary, to attain a chosen goal. Whether he does or not, depends on his ambition, or his conscience, or his "instinct of workmanship," as Veblen called it.

To understand americans you have to understand baseball, our national pastime. Reid[96] correlates baseball and American philosophy in 4 ways: both are grounded in uncertainly and asking questions; both include risk and failure; both require testing of oneself; and both include an obligation to cooperate, help, and challenge others.

Summing up volunteer activity in the United States, it is estimated that 29% of Americans engage in volunteer activity with a median of 50 hours per year, and 35% of that group are engaged in faith-based activities.[79-81] A Google search of volunteer, humanitarian efforts is summarized in Table 11. The majority of volunteer activities are usually small efforts performed at the local level, what the Germans call "Barmherzigkeit" (small acts of mercy performed with compassion).

Volunteerism in Surgery

Having an appreciation of the background given, we can now focus on the surgeon's role in national/international, home/abroad, or domestic/foreign volunteer humanitarian healthcare activity. Surgeons are a special breed, given their training and background. They are well-suited for international activity. The ability to adapt and improvise and function in unusual or awkward situations requires a special talent and is familiar to them. They clearly know how to think and function "out of the box." This has been demonstrated in the military where surgeons not only performed the above, particularly in dangerous situations, but historically introduced avant garde therapies (eg, the approach to penetrating heart injuries in World War II, vascular surgery in Korea and Vietnam, and now the advanced capabilities for definitive care within the combat zone, as witnessed presently in Iraq with the Forward Surgical Team [FST] concept).[97]

The American College of Surgeons (ACS) has been cognizant and supportive of volunteer efforts and opportunities. The *Bulletin* of the ACS historically has published a series of articles regarding college member activities in both domestic and foreign volunteer humanitarian efforts.[98] Recently the ACS has developed a program—Operation Giving Back.[15] Promulgated by Andrew Warshaw, MD, a survey of ACS members was conducted in 2003. Eighty-eight percent of the responders volunteered at least once in their careers. Efforts to change malpractice laws, listing volunteer opportunities, and continued reporting of volunteer experiences in the *Bulletin* of the ACS were recommended. Additionally, the *Archives of Surgery* has published a series of articles relating to surgery in several foreign countries.[99] Under the directorship of Kathleen Casey, MD, the ACS website has become a major source for information relating to both domestic and foreign surgery volunteer efforts and opportunities.[15] The recent tsunami and Hurricane Katrina relief efforts are notable examples where volunteer opportunities for surgeons were listed.

Historical Aspect of Medical Volunteer Humanitarian Efforts

Faith-based missionaries pioneered medical humanitarian efforts worldwide.[100] Catholic missionaries had a 3-fold mission: care of the soul, the mind, and the body. Churches, schools, and hospitals have been started, and supported by these devoted missionaries, and continue to the present. The Europeans, and subsequently North Americans, have continued to support existing and pioneer new efforts around the world.

A few contemporary examples include the work of Damien among the lepers.[101] Father Joseph De Veuster spent 16 years in the Hawaiian island of Moloki caring for lepers; he died in 1889 of leprosy. The Damian Foundation persists today with worldwide programs treating leprosy and tuberculosis in endemic countries. Albert Schweitzer, MD, is considered the premier contemporary example of global humanitarian medical missionary work.[102] A winner of the 1952 Nobel Peace Prize, Dr. Schweitzer spent his entire medical career from 1933 to 1965 in his beloved Africa caring for the needy. Less famous, but recognized examples include Paul Carlson, MD, a medical missionary to the Congo who was killed there in 1961.[103] Tom Dooley, MD, who also died in 1961, was a young Navy doctor serving in Indochina, who remained and cared for thousand of patients caught up in that war-torn region.[104]

The legacy continues. Dr. Amram Cohen, an Israeli cardiothoracic surgery, trained in the U.S. Army, established a worldwide foundation, Save a Child's Heart. This NGO treats needy children in emerging

TABLE 12. The surgeon's armamentarium

Objective:
• Knowledge
• Skill
• Information
Problem/Challenge → Solution/Resolution
Subjective
• Maturity
• Experience
• Judgment
GOALS/Attitude/Focus
• Competence
• Personality
• Character
• Availability
• Affability
• Ability
• Accountability

economies without access to corrective heart surgery, both in their own country and back in Israel. He died suddenly on vacation in 2001. His works still carry a poignant message[105]:

I am convinced that for the vast majority of people who chose cardiothoracic surgery as a profession, idealism was initially a strong factor. For those of you who are reading this and just starting out, hold fast to your "day after-vision" because, if it fades, despite all the skills acquired, there will be something missing. For those who are searching, join us and together let us make the network to help children with heart disease globally big enough to be equal to the task. There is work for everybody. There are no dollars and cents in it, but it is worth a fortune.

Amram Cohen

Scurlock[106] has nicely defined the prerequisites of the modern-day surgeon that makes him/her well suited for volunteer/humanitarian activity: temperament, judgment, discipline, responsibility, perseverance, ability to accept challenges, and a continuing need and desire to learn. Table 12 puts this in perspective. As always, the 4 As are the usual ingredients for a successful surgical practice.[107]

The surgeon's career can be divided into stages (Fig 7). The premedical, medical school, and residency stages become tempered with the realism of active practice, where paying off debt, supporting a family, and establishing a practice take precedence. So where to begin or consider voluntary efforts becomes a very personal thing.

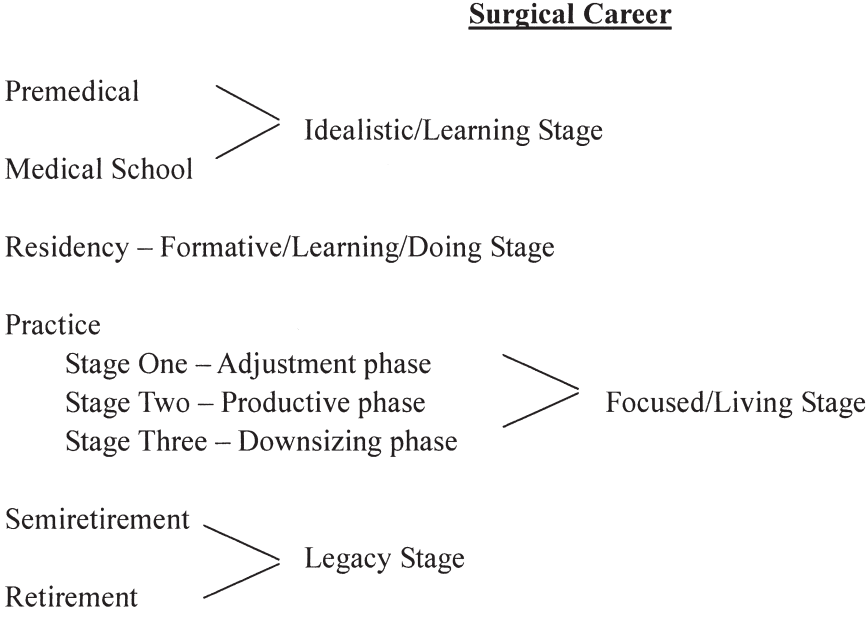

FIG 7. Surgical career.

In recent years, surgical practice in the United States has been challenged in 4 major areas: decreasing caseloads, increased comorbidity and complexity of disease complexes, increased expectations, and decreasing reimbursement. This has created 3 subsequent trends: decreased interest in surgical careers; reshifting, adjusting, or relocating one's surgical practice; and early retirement for those whose ego and finances permit. Perhaps, a volunteer/humanitarian experience may provide a well-needed time-out or hiatus to regroup and realign one's priorities. Certainly not for all, but for some it could be a defining experience that opens up a whole new way of looking at things.

In a practical way a surgeon usually looks at his practice or profession from 4 points of reference (Fig 8). We will look at these tactical areas from the perspective of a surgeon with past, present, or potential future experience in volunteer work.

Tactical Aspects

There are 2 kinds of opportunity: 1 which we chance on, the other which we create.

Takamori Saigo (An Asian perspective)

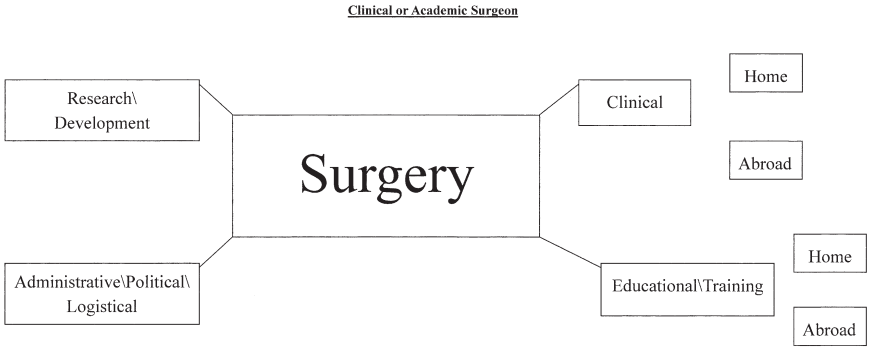

FIG 8. Clinical or academic surgeon.

No great man ever complains of want of opportunity.
Ralph Waldo Emerson (An American perspective)

Success is being available at the time of opportunity.
Disraeli (A European perspective)

Clinical

The ultimate goal of the voluntary/humanitarian effort is to focus on delivering increased quantity and quality of surgery on a global level.

International or global medicine is not a new concept. For many years religious- and non-religious-based medical missionaries have traveled to developing countries to deliver basic medical care. Although religious or humanitarian based, the trust and allegiance they gained has become the foundation on which these current strategies are based. Additionally, the corporate world has been involved. In many countries with foreign-based operations, clinics and hospitals were established to care for native workers (eg, Firestone Tire Corporation Hospital in Liberia to care for rubber plantation workers). The military, especially in the United States, has a long tradition of providing immediate, short-term care to noncombatants in foreign countries both in times of war and in times of peace, especially natural disasters. A tremendous effort was made by the former colonial powers to institute healthcare systems. Great Britain and France, in particular, established basic infrastructure including health care in their former colonies. The legacy remains in many of the colonies, particularly the anglophone and francophone countries of Africa. It is imperative to keep the host country's clinical healthcare history and experience in perspective.

At present there are 3 types of clinical activities/relationships. The first is nonpaying patients with no local access to simple or complex care coming to the United States or other developed countries for "free care." Although beneficial to the selective few, it requires an intense financial/logistical effort. Large groups such as Rotary Gift of Life, Variety International, and Heal the Children still continue this activity, but at a much reduced level. The collateral benefit has been to give increased awareness to the international need, and it also helps with marketing and fundraising. The second area is paying patients coming for care—to be discussed further. Finally, the area of concentration is to go to the host site to provide short-term care, establish continuing relationships, and buy into the "teach to fish" mentality.

Surgeons perform 3 temporal clinical functions: they evaluate, select, and prepare patients for an operation; they perform the operation or procedure; and take care of the patient postoperatively. In the United States, an entire infrastructure supports this effort. There are major differences in the developed and emerging economies. In a simplistic view the developed countries have all the tools and capability, but with decreasing caseloads, increased complexity, increased expectations, and decreasing reimbursement. In developing countries there is a dearth of wherewithal to perform surgery despite larger caseloads, decreased access, decreased funding, less expectations, decreasing incentive, and growing frustration.

Volunteer clinical opportunities should include: where the need is desired and where it is most needed. A simple 10-point global scheme is outlined in Fig 9. It is divided into the 3 major 8-hour time zones. This has practical value in planning from a distance/time point of view. Consider the climate, seasonal variation, terrain, location, and local access. The level of clinical activity needed or available is summarized in Fig 10. Where you go and what you do usually falls into 1 or a combination of the 5 levels of activity.

Levels I and II are primarily outpatient or community hospital type surgical opportunities. Working with long-term volunteer foreign missionaries and local medical staff with varying levels of training and experience presents challenging, yet sometimes frustrating, opportunities.

Clinical levels III and IV, opportunities abroad for surgeons, include solo efforts as visiting professors; working solo with a local group; as part of a small or large group; or as part of an academic program with foreign affiliations. These types of surgical programs are shown in Fig 11. Upscale programs are where surgeons go to advance themselves (eg, surgeons coming to the United States for observational visits, or a cardiac

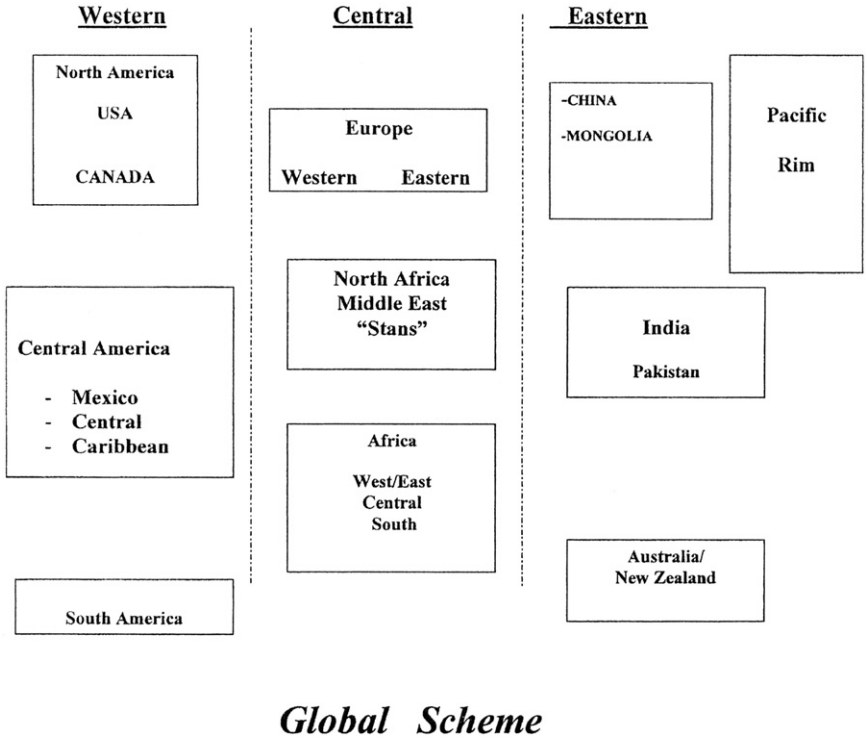

FIG 9. Global scheme.

surgeon visiting Leipzig, Germany, to witness advanced robotic cardiac surgical procedures). A lateral program is usually an academic affiliation with a foreign program that involves clinical, educational, and research efforts. The upgrade program is a place that is in need of economic relief, for example, equipment and supplies, or for demonstration of new or advanced procedures and specialized care. The rejuvenate program is where surgery has ceased for political, economic, and social reasons and wants to get reestablished. The de novo program is starting or introducing a center that is new and needs a total effort. These last 3 programs are the usual areas for voluntary humanitarian activity. It must be stressed that most missions are short term (<2 weeks) and deal with mostly elective cases. Emergency or urgent cases are not often seen, unless it is a mass-casualty, disaster-type mission. The volunteer opportunities usually are with NGOs. Yet other opportunities are available (Table 13).

Level V opportunities are usually reserved for the daring and ambitious

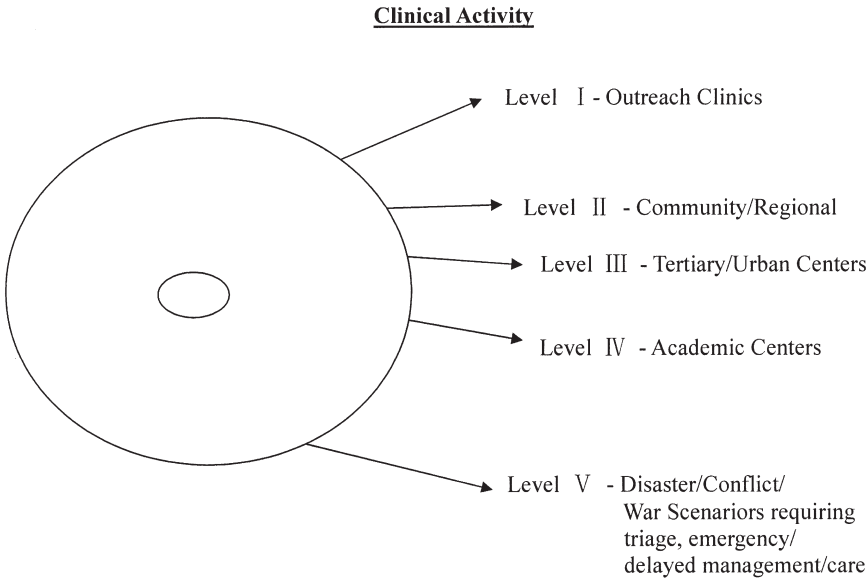

FIG 10. Clinical activity.

individuals and groups who are available at short notice and willing to take on varying levels of danger, complexity, and security issues.

In approaching clinical surgical problems in developing countries consider a few basic facts. Clinical history may be vague and incomplete, mainly related to educational and language constraints. Diagnostic capability may be basic. Increased reliance on physical examination is crucial. Radiograph and laboratory tests are marginal and sometimes incomplete. The developing world is desperately short of radiologists and functioning imaging equipment.[108] Added to this is a lack of infrastructure for repair/replacement, or preventive biomedical maintenance. Biomedical engineers are a rare commodity, and therefore there is a total reliance on lucrative foreign corporate contracts for repair and maintenance. Basic local training in low-cost, portable ultrasonic equipment would be a tremendous advance in diagnostic capability (the Acuson Cyprus ECHO machine is a prime example of diagnosing congenital heart defects at the local, ambulatory level). The etiological, anatomic/regional, pathophysiological/subsystem approach to differential diagnosis and categorization may be useful (Table 14). The keep it simple (KIS) principle is a valuable consideration. Recognizing one's limitations is crucial:

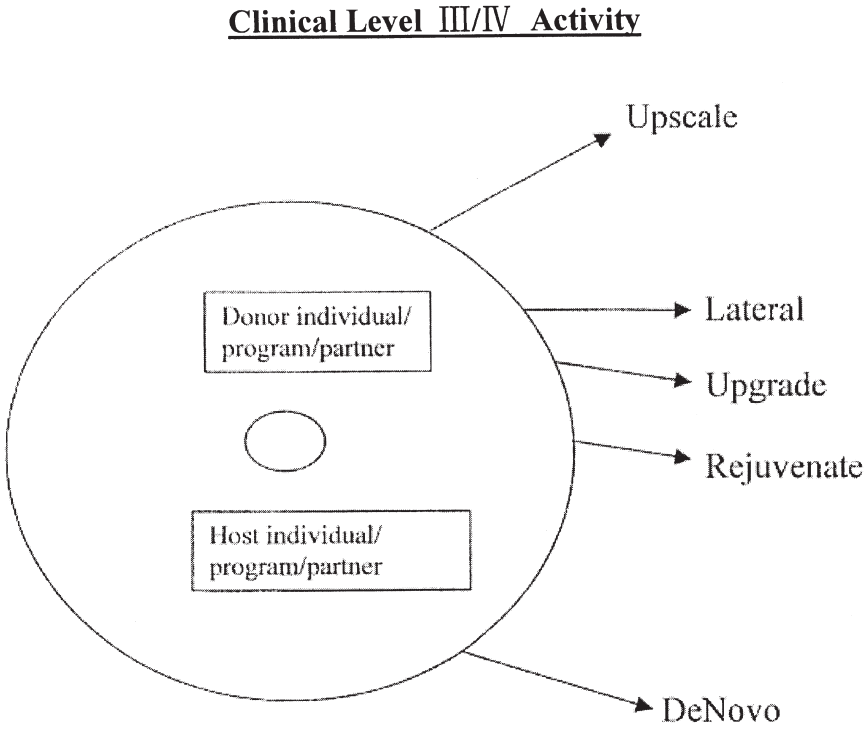

FIG 11. Clinical level III/IV activity.

TABLE 13. Clinical opportunities

- Solo—Join host surgeon, group, or medical center
- Group—A team effort acting outside the NGO realm
- NGO—Small focused NGOs—Larger NGOs with multiple sites and programs (eg, Medecins Sans Frontiers)
- Bilateral—Working with U.S. government agency like Peace Corps or USAID
- Multilateral—United Nations—WHO (to the author's knowledge there are no surgery specific initiatives)

Less is more; more is less.

Andrew Fiore, MD

or

The enemy of good is better.

Anonymous

To summarize, the surgical volunteer should consider the following

TABLE 14. Clinical approach to surgical problems: differential diagnosis

Etiological
Trauma
Infection
Cancer
Congenital
Local manifestation of systemic disease
Postoperative change/result/sequela
Anatomic/regional—head/torso/extremity approach
Head/neck
Thorax
Abdomen
Extremities
Pathophysiological/subsystem approach—organ/system dysfunction
Neurological
Respiratory
Circulatory
Gastrointestinal
Endocrine/metabolic
Infectious/immunologic
Renal
Fluid/electrolyte imbalance
Wounds
Nutrition
Vascular
Vegative aspects* (eg, fever, pain, anxiety, nausea, vomiting, diarrhea, insomia, constipation)

*BSP (bowels/sleep/pain)

items after he has already decided to get involved. Where to go? Table 14 gives a global picture, in terms of regions to consider. When to go is important; climatic changes must be considered. Winter trips to the high altitude or cold regions should be avoided, as well as tropical storm seasons. Who to go with? Figs 10 and 11 give basic types of situations and Table 13 gives the ways of getting involved. Ideally, for the first time volunteers, it may be prudent to join an established small group or NGO on a focused short-term mission (<2 weeks).

Another important aspect to consider is the level of surgical skills needed and the capacity to perform those skills at the given location[111] (Table 15). Also, consider the level of care already in place, with some consideration of traditional, yet sometimes unproven treatment schemes[110,112] (Table 16). Disease-specific missions, especially for surgical specialties, is of great value (eg, plastic surgery/ears/nose/throat groups performing cleft lip surgery, ophthalmology with cataract surgery, orthopedics with basic congenital deformities and osteomyelitis, gynecology with vaginal fistulas, and urology with urethral strictures). Most of

TABLE 15. Surgical skill requirements[109]

1. Surgical care must be effective and safe.
2. Surgical care must be widely accessible, either by transport systems or by regional centers.
3. Surgical care must be affordable within the local and national capacity.
4. Surgical care must be appropriate for local situations. Infrastructure, such as supply of electricity, communications, available laboratory and pharmaceutical capacity, and so forth must be considered in planning.
5. The surgical care system must be locally sustainable. Repeated provision of services by external visiting surgical teams can be extremely helpful, but should not take the place of permanent and affordable local programs.

TABLE 16. Types of healers[110]

Indigenous	Western biomedical
• Midwives	• Pharmacists
• Shamans	• Nurse-midwives
• Curers	• Nurses
• Spiritualists	• Nurse practitioners
• Witches	• Physicians
• Sorcerers	• Dentists
• Priests	• Other health professionals
• Diviners	
• Herbalists	Other medical systems
• Bonesetters	• Chinese medical system Practitioners Chemists/herbalists Acupuncturists
Pluralistic	• Ayurvedic practitioners
• Injectionists	• Taoist priests
• Indigenous health workers	
• Western trained birth attendants	
• Traditional chemists/herbalists	
• Storekeepers and vendors	

the emergency and urgent surgery in developing countries and emerging economies is performed at the first referral level (I) or district/rural health (II) facilities. For women, the leading causes of maternal death (>500,000/yr) are related to bleeding, infection, unsafe abortion, eclampsia, or obstructed labor. The role for rural surgery training to include gynecology, orthopedics, urolological, and ENT procedures is essential. Voluntary efforts at levels I and II clearly require training and experience in these subspecialty clinical areas.

Recent activity in the United States and Canada are addressing some of these issues. An example is the Center for Rural Surgery at the Bassett Health Care Center in Cooperstown, NY (www.centerforruralsurgery.org/mission.asp). With 24% of the U.S. population living in rural areas, only 9% of physicians practice in those areas. Approximately 27% of sur-

geons' practices in rural areas include endoscopic, gynecologic, orthopedic, urologic, and otolaryngolic procedures. This parallels the needs in developing countries. At the rural or referral health facilities in developing countries, trauma from road traffic injuries and violence/war occurs in 57% of the patients seen.[111] Knowledge and experience with Advanced Trauma Life Support (ATLS) training and the tactics of essential surgical care are needed. The WHO has developed the manual *Surgical Care at the District Hospital* (available at http://whqlibdoc.who.int/publications/2003/9241545755.pdf). This, along with the essential surgical skills course developed in Canada, are practical, broad-based sources of preparation for a rural experience in developing countries.[112]

At this point I will introduce a sensitive subject. The motivation and reasons for these voluntary efforts are very personal and private. However, I would caution against the voluntary aspect of "surgical tourism." Most programs are looking to develop friendships and lasting relationships. That also includes continued follow-up and future collaboration. The "circus coming to town" can have a negative impact and create an uncomfortable and awkward situation for all concerned.

. . . And I thought that a continuum of care would be essential in this project rather than just a one-time, flash-in-the-pan event.[113]

Dennis A. Fried, MD[113]

A few words of caution here: Do not make promises you know you cannot keep, such as "I'll be back." Giving unrealistic hope is fraught with ultimate fear, desperation, then anger, and ultimately despondency.

Medical/Surgical Tourism

Different from volunteer surgical tourism activity, medical/surgical tourism includes paying patients from developed countries seeking lower cost health care in foreign countries (www.privatehealth.co.uk/hospitaltreatment/treatment-abroad). It is outsourcing of sorts. Noninsured surgical procedures can be performed at a lower cost in some foreign countries. Initially seen with cosmetic surgery, this has extended to more complex procedures, such as renal transplantation and open heart surgery. Volunteers should be aware of this activity, particularly in Central America and the Caribbean, as well as in other emerging economies such as India and China. In certain foreign centers of excellence, the quality of surgery is comparable to Western standards, albeit at a much reduced "out of pocket" cost. Whether third party payers will get on board this notion of outsourcing medical care for U.S. patients remains to be seen. The India example is exemplified by Dr. Pratap C. Reddy, CEO of Apollo

Hospitals, Ltd. His goal is to make India the global healthcare destination.[114] This stands in the face of India providing only 2% of its GNP for healthcare services of its own population, and with more than 16% for military spending.[115]

The other side of this area is foreign patients seeking care in U.S./Western centers. Large U.S. centers such as the Cleveland Clinic have a large experience and active programs for funded patients from abroad. There has also been, and continues to be, to a much smaller degree, nonfunded patients coming to the United States for free or markedly discounted prices. Although valuable and life-saving to the fortunate few, this has not proven to be cost-effective or contribute to long-term efforts to help a larger number of patients who are poor or have no access or availability to complex/costly procedures at home. Its primary value has been to help the fortunate few, increase marketing for funding, and to continue to offer hope for the majority in their native country. If you are involved with volunteer efforts for these foreign patients, it is important to be actively involved in the process of selection and logistics (Table 17). The unsung heroes in this endeavor are the nonmedical volunteers who provide local logistical help for patients and families. The foster families who open their hearts and homes to these fortunate few are a joy to watch and witness.

Education/Training

Some basic information regarding medical education in the United States is useful, so as to better place international medical education in perspective. The average American finishes medical school at 26 years of age. The average tuition and fees for 2003 to 2004 was $16,153 for public medical schools, and $32,588 for private medicals schools.[116] This amounted to an average debt of $140,000 for public schools and $225,000 for private schools. Paying off this debt, funding residency beyond basic salary, and looking at decreased clinical jobs/opportunities, as well as decreasing caseloads with increased comorbidity, accountability, and expectations are the great challenges/problems facing the next generation of American trained surgeons. Making the case for a career in surgery is the challenge for most U.S. surgical training programs.

The average foreign doctor finishes medical school 2 years earlier, at 24 years of age. There are currently 1843 medical schools listed in 165 countries (www.iime.org/database/). The International Medical Education Directory, maintained by the Foundation for Advancement of International Medical Education and Research (FAIMER), tracks those medical schools recognized by their local government.[117]

TABLE 17. International surgery patients (category: free care/partial funding/discount/full pay)

Letter from sponsoring physician to U.S. Embassy for entry visa
Surgery unavailable in native country
No access to surgery in native country
Financial constraints/limitations
Length of stay; responsible party(s)
Travel to hospital for patient/family/others—local transport from airport to destination—facility/hospital/foster family
Housing/lodging preoperative/post-discharge/clinic
Outpatient considerations—drugs/clinic/tests
Cost (for paying patients)
10-day stay/per diem thereafter
Hospital
Physician
50% total cost initially (cash; bank transfer)
Remainder prior to return to native country
Local host committee
Language
Food
Customs/religion/misc.
Communication home
Phone
Fax
Letter
E-mail
Transportation to/from airport; travel arrangements
Visa extension situations; beware "jumping visa"
Follow-up in native country with:
Local medical doctor/referring physician
Specialist
Studies needed
Strategy for further care for complications or more surgery

At the graduate training level the differences between the United States and the world varies tremendously. The United States uses an organized, standardized education/training system for graduate medical education (GME) or postgraduate training. The Accreditation Council for Graduate Medical Education (ACGME) coordinates GME. The ACGME is the umbrella organization for the Residency Review Committees (RRC). The American Board of Medical Specialties (ABMS) is the corresponding organization for the specialty boards (www.tsda.org/progdir/abms.htm; www.acgme.org/acwebsite/home/home.asp). With well-defined standards criteria for education/training, and requirements for certification, the trained U.S. physician is well prepared and qualified. Subsequent recertification, state licensure renewal, credentialing by hospitals, and continuing medical education (CME) help maintain a quality and accountability of medical practice.

The surgical training system in the United States evolved from the European pyramidal/apprenticeship model, which was inherently unstructured and not time defined for completion. Before World War II, advanced surgical training was acquired in Europe. As an example, from 1870 to 1914, more than 15,000 U.S. undergraduate and postgraduate students studied in German medical schools alone.[118] This remains the system in many countries today.

The establishment of the U.S. surgical training system was started by William Halsted, MD, at Johns Hopkins Hospital in 1889. Borrowing from the European pyramid model, this model gradually evolved into the "rectangular" system that we see today.[119] Pioneered by Edward D. Churchill, MD, at Massachusetts General Hospital, there was a conversion of methodology from dominant master to docile apprentice, to an interchange of knowledge between the teacher and the student. More importantly, the timeframe/duration of training was established.

Establishing present day U.S./European style training programs in emerging economies is a formidable challenge and endeavor. As an example, China, the 3rd largest country in the world, with a culture dating back over 7000 years and the largest population at more than 1.3 billion, does not have a national based graduate medical education program or system. Excluding 10% to 20% of 5-year medical school graduates after high school who do not pursue a medical career, the majority of students seek employment at predominantly government hospitals, controlled and managed by local medical schools or health bureaus. Each hospital designs and runs its own residency program in a pyramidal system that harkens back to the older European system. Recently, many of the larger urban medical centers have established organized residency programs. A model standardized 6-year cardiothoracic residency program has been initiated recently at Shanghai Chest Hospital under the auspices of the World Heart Foundation. Patterned after the U.S. system, it has been modified for China. The major challenge has been restructuring the faculty to accept a horizontal, time-limited training system with graduated degrees of resident responsibility and accountability. This is a challenging area and a viable opportunity for volunteer faculty, especially semiretired and retired surgeons (www.world-heart.org).

Preparation for working in an international area is sometimes difficult, complex, and challenging. Most current American trained surgeons, as mentioned, are not adequately prepared for international surgery. Several initiatives have been advanced to alleviate this program. Historically, Seymour Schwartz, MD, from Rochester, New York, published a text on tropical surgery, which demonstrated operative techniques for problems

in Sub-Saharan Africa (SSA). Recently, Kamel and Lumley[120] published a comprehensive text on tropical surgery. Several surgical training programs have developed a rural surgery curriculum that better serves the needs of the rural or somewhat isolated areas. This is good preparation for foreign activities as well. Already, more surgical training programs in the United States, Canada, United Kingdom, and New Zealand are offering rural/international surgery training, as well as sponsoring and developing collaboration with emerging countries. The 2-fold goal is to allow residents an opportunity both to learn and to serve. They learn surgical techniques that are appropriate abroad as well as provide service in needed areas. Ozgediz and colleagues[121] have beautifully described a program developed between the surgery departments of the University of California at San Francisco and Makerere University in Kampala, Uganda. A pilot, voluntary 6-week clinical rotation is in evolution there. The major hurdles or obstacles in developing such a relationship are: a clear and concise memorandum and business plan; issues relating to visa, licensure, credentialing, housing, lodging; mentoring and supervision of resident cases; use of vacation time versus allowed elective time for credit; credentialing and academic appointments of the host country; recognition of credit for resident cases performed in the host country; financial support of residents by the donor program; and loss of resident workers from the donor program. Several recent on-site experiences illustrate the benefits derived for both the donor and host. Karamichalis and Moller[98] describe an experience of donor staff and residents providing clinical care and education in Mexico. This exemplifies the concept of coordinated missions where all participants learn from the experience. The future will see more U.S.-based residents seeking experience, exposure, volunteerism, and training in foreign programs that not only have available pathology but local staff with varying degrees of experience.

The International Relations Committee of the American College of Surgeons convened a conference in 2000.[109] The Committee stressed the concept of direct participation in host programs, particularly in training for the types of surgery performed locally. Adjusting to local constraints and lack of essential equipment/supplies demands improvisation. A teaching curriculum is essential and must include titration to the local needs, basic science, basic skills, basic logistical management, and adjustments for the emergence of newer clinical problems, especially trauma and chronic diseases such as cancer and cardiovascular disease.

Several foreign medical graduates (FMGs) seek initial or further surgical training in the United States. Some knowledge in this area is

TABLE 18. Requirements for applications to U.S. residency programs*

- Degree from an accredited foreign medical school
- USMLE Step 1 and Step 2 Clinical Knowledge (2CK)
- USMLE Step 2 Clinical Skills (2CS) (previous Clinical Skills assessment [CSA] and English language proficiency [TOEFL] fulfill the 2CS requirement)
- Clear financial account with ECFMG
- Permanent validation of ECFMG Certificate (Form 246)
- J-1 Exchange Visitor Program & ECFMG Sponsorship

*http://www.ecfmg.org/cert/certfact.html.

TABLE 19. Residents in training in U.S. allopathic hospitals*,+

Academic year	Total residents	Graduates of U.S. medical schools	Graduates of foreign medical schools
1988–1989	82,795	71,239	11,556
1989–1990	87,001	73,680	13,321
1990–1991	91,781	75,764	16,017
1991–1992	95,162	77,020	18,142
1992–1993	98,622	77,721	20,901
1993–1994	102,341	78,581	23,760
1994–1995	103,754	78,074	25,680
1995–1996	104,612	77,849	26,763
Increase from 1988–1989 to 1995–1996	21,817	6,610	15,207

*Data are from the Association of American Medical Colleges.
+Mullen, F. The National Health Service Corps and Inner-City Hospitals. N Engl J Med 1997; 336:1601.

useful, so as to better advise/counsel FMGs seeking information and support. Adebonojo and colleagues[122] have prepared a comprehensive review for FMGs, primarily from Africa, to use as a guide. The Educational Commission for Foreign Medical Graduates (ECFMG) is the main certifying body for FMGs (http://www.ecfmg.org/cert/certfact.html) (Table 18). An overview of FMGs in U.S. training programs, practicing in United States, and country of origin are illustrated in Tables 19, 20, and 21.[123-125]

The primary goal of FMGs training in the United States is to develop skills and training to apply on returning home. For personal reasons, and sometimes enticement to remain, some FMGs pursue immigration routes to remain and live in the United States. This is somewhat controversial, since many of these countries are in desperate need of their services.

Recently, the ECFMG has brought tighter controls to bear. Nonaccred-

TABLE 20. Graduates of U.S. and foreign medical schools practicing as allopathic physicians in the United States*,+

Category	No. of physicians		
	1985	1989	1994
All graduates	511,090	559,988	632,121
Graduates of U.S. medical schools	398,430	437,165	483,039
Graduates of foreign medical schools	112,660	122,823	149,082
U.S.-born	16,344	18,905	19,275
Foreign-born	96,316	103,918	129,807

*Data, which are year-end numbers, are from the American Medical Association's Physician Masterfile.
+Iglehart, JK. The Quandary over Graduates of Foreign Medical Schools in the United States. N Engl J Med 1996; 334:1679.

TABLE 21. International medical graduates

The 10 most prevalent non-U.S. nationalities among international medical graduates (IMGs) working in the United States*,+

Country of birth	Fraction of IMG physicians	Fraction of IMG residents and fellows
India	21.0%	25.1%
Philippines	9.0%	3.9%
Cuba	4.2%	<2.0%
Pakistan	4.2%	6.8%
Iran	3.1%	3.3%
Korea	2.7%	<2.0%
Egypt	2.5%	2.7%
China	2.4%	3.9%
Germany	2.0%	<2.0%
Syria	2.0%	2.8%

*Data are from the American Medical Association, Physician Masterfile, 2004.
+McMahon, GT. Coming to America: International Medical Graduates in the United States. N Eng J Med 2004; 350:2437.

ited fellowships are now limited to 1 or 2 years. This provides a reasonable time frame for advanced "hands on" clinical training and a better chance that the FMGs will return home.[126,127] The need back home is obviously great[128] (Table 22). Yet there are still beneficial short-term (1-3 months) observational surgical opportunities in the United States, but they require a recognized sponsor (usually an institution or surgical department) for a U.S. tourist visa.

Other examples of focused training initiatives include the extension of the Advanced Trauma Life Support program to emerging economies.[129] A recent program of the ACS with the West African College of Surgeons was most successful in training surgeons in the ATLS methods.[130]

TABLE 22. Number of surgeons per 100,000 population worldwide[+]

United States	51	Healthcare Personnel, 1993*
Japan	31	Nurses MDs (per 100,000 population)
Sweden	29	
Canada	26	
The Netherlands	18	
Australia	16	
Germany	13	
New Zealand	12	
Poland	11	
China	10	
Qatar	9	
Ireland	7	
Latin America (Colombia)	7	
United Kingdom	6	
South Africa	6	
Egypt	6	
Bahrian	5	
Kuwait	4	
Philippines	1.45	
Sudan	0.6	
Kenya	0.6	
West African States	0.5	
Tanzania	0.3	
Africa	78	20
Americas	378	177
Europe	601	308

*Merson, MH, Black, RE, Mill AJ. *International Public Health.* Gaithersburg, MD: Aspen Publishers, 2001; p. 323.
[+]Mac Gowan, WAL. Surgical manpower worldwide bulletin. Am Coll Surg 1987;72:5–7.

At the corporate level, industry has recognized the need for training local personnel, thereby enhancing surgical capability and expertise, and ultimately increasing purchase of their product. Examples include the Medtronic School of Perfusion in India and the Johnson and Johnson surgical training center in Shanghai, China. Another initiative involves larger medical institutions or NGOs establishing and sponsoring a center in the host country. A recent example includes the ambitious work of Richard Jonas, MD, in collaboration with Project Hope, and the Shanghai Children's Medical Center.[131] Over a 10-year period this center has become the dominant clinical and educational center for pediatric cardiac surgery in China, performing more than 1500 open heart operations per year.

In 1957 the communication age emerged with the launching of the Sputnik satellite into space. At the present time not only do we communicate globally, but we and everyone else have the potential to

know where we are and where we are going (advances in the global positioning systems [GPS] using the 4 satellite navigation system have created that capability). Telecommunication has emerged as a powerful tool to transmit visual information. International cooperation began in 1971 with the Intelsat IV (International Telecommunications Satellite Organization).[132] For surgeons, tele-education, telementoring, and robotic surgery will continue to grow and expand worldwide.[133,134]

This use of this emerging technology, especially the Internet, will have a wider application for continuous, sustained efforts. The world is clearly connected. In 2001, 520 million people used the Internet.[135] Now more than one half that number are non-English speakers. As a vehicle of transfer of medical information, skills, technology, and knowledge, the Internet is a valuable tool. Witness the greater than 2 millions hits/month on the cardiothoracic surgery website (www.ctsnet.org). Continuing medical education (CME) is now available for credit online. Home schooling is a reality.[136] The web language HTML allows for high-quality video and audio. Telemedicine is the use of this electronic information and communication to support healthcare initiatives. This has immense value in both rural and foreign scenarios.[137,138] Lectures, clinics, consults, conferences, and operative procedures can all be transmitted via telemedicine. The limiting factors become cost, time zones, and initial infrastructure issues.

Another emerging issue in global humanitarian efforts includes the establishment of databases to record and document clinical activity for future study and evaluation. International surgical registries have already been initiated. Examples include the congenital cardiac surgery called Aristotle.[139] This has been extended to the worldwide audience, as has the European Cardiac Surgical Registry (ESSUR).[140] At the NGO level, database and quality assurance programs are becoming a reality. Hesslein and Cushing[141] have developed a quality assurance program that helps smaller groups define and objectify their programs. This becomes an integral educational tool for both the donor and host program.

Evidence-based medicine (EBM) and practice is a key component of advancing care in developing countries. As the developed countries become more familiar with EBM and incorporate it into their daily clinical practice, it will become easier to transfer this knowledge and experience to the international community.[142] In the beginning this EBM process will be driven by individuals rather than systems, especially in emerging economies.

The role of national and international meetings in education and training should be highlighted.[143] To the academic value is added the opportunity

to be updated on corporate efforts with new equipment, supplies, and technology. It is an opportune time to get corporate help and donations. Networking with colleagues from around the world offers a time-effective way to compare notes and initiatives and make new friends, along with establishing or fermenting existing relations. Taking advantage of relaxation and enjoyment at international locations helps to round out the effort. Tax-deductible advantages vary and should be discussed with appropriate accountants and tax advisers. Attending an international meeting/conference in conjunction with a voluntary project/mission/trip is a practical and cost-effective way to achieve multiple goals.

In the education/training effort English is a challenging problem.[144] There are more than 2700 languages worldwide, with 350 million of the 6.5 billion world population using English as their first language, and another 400 million with English as their second language.[145] Most physicians speak varying degrees of English, but it is less prevalent among nurses and other staff. Pictures, hand signals, and laptop computers become invaluable in this area. Speaking slowly and clearly helps learning useful foreign languages phrases.

The world of surgical literature is evolving rapidly. Many basic textbooks and monographs have been translated into multiple languages, making it easier to reach the non-English speaking audience. Pirated low-cost copied books are readily available in many countries, recognizing violation of copyright laws. The surgical journals are seeing progressive changes, especially with the increase of articles/manuscripts from non-U.S. countries. In a comparison of 5 U.S. general surgery journals (*American Journal of Surgery, Annals of Surgery, Archives of Surgery, Surgery,* and *Journal of the American College of Surgeons*) from 1983 to 1998 there was a decrease of 15.1% in U.S. articles. In 1998, 66.8% of the articles were from North America, 17% from Europe, and 12.6% from Asia.[146]

A growing movement is occurring to make this medical literature freely accessible on the Internet. This is called the open access movement. The 2001 Budapest Open Access Initiative for free access to literature is summarized[147]:

. . . read, download, copy, distribute, print, search, or link to the full texts of these articles, crawl them for indexing, pass them as data to software, or use them for any other lawful purpose, without financial, legal, or technical barriers other than those inseparable from gaining access to the Internet itself. The only constraint on reproduction and distribution, and the only role for copyright in this domain, should be to give authors

control over the integrity of their work and the right to be properly acknowledged and cited.

It is extremely important to have an objective idea of what the host program or effort is looking for. In the operating room the volunteer surgeon either observes, 2nd assists, 1st assists, or performs the operation. That is an important area to reflect on, because it changes within a given project or varies from project to project. Also for the surgeon, education/training is accomplished at varying levels: mentor, coach, manager, or instructor level. The instructor level is very objective, short-term, and achievable (ie, teaching a specific technique or procedure). At the manager level, a systems process is introduced where team and structure are introduced. At the coaching level the integration of team and structure is brought into a systems analysis. The mentor level is the personalized, subjective aspect of teaching/advising. It is the level where both individuals and systems are looked at from a social/philosophical perspective that gives insight/suggestions on a long-term basis, grounded in trust, respect, admiration, congeniality, and concern. It is here that the human factor plays its greatest role. Loop,[148] in a classic treatise on mentoring, exploits the notion of the surgeon's professional life as involving education, achievement, and payback. Payback is the area where mentoring has its greatest effect. Mentoring is ultimately crucial for the development of personal standards, of which competence, personality, and character are critical components.

Research/Development (R/D)

R/D occurs in 3 scenarios: 1) bench, laboratory; 2) bush, ambulatory clinical area; and 3) bedside, hospital/clinic setting. Certainly not the major focus, R/D is an important element as emerging countries grow and develop. From the voluntary humanitarian perspective, ethical principles become a major concern. At the onset, ethical principles regarding clinical and education/training initiatives carry over into R/D. C. Rollins Hanlon, MD,[149] has nicely summarized the 6 major principles that should govern health care (Table 23). The ACS has carried these major principles over to the development of a "Code of Professional Conduct."[150] Both these elements also apply to global humanitarian efforts. There are 2 areas that volunteers must be aware of. The first involves dealings with corporate or business individuals, especially in foreign countries where local practice is at variance with the U.S. standards. Recent codes in this area have been developed by Adva Med for the United States and should be applied internationally.[151] The second area is in research involving

TABLE 23. Ethical principles for everyone in healthcare[149]

1. Healthcare is a human right.
2. The care of the individual is at the center of healthcare, but the whole system needs to work to improve the health of population.
3. The healthcare system must treat illness, alleviate suffering and disability, and promote health.
4. Cooperation with each other, those served, and those in other sectors is essential for all who work in health care.
5. All who provide healthcare must work to improve it.
6. Do no harm.

clinical subjects. Suffice it to say, clinical studies involving human subjects outside the United States should abide by all the ethical standards established by the international community.[152,153] The National Bioethics Advisory Commission has developed guidelines for developing countries.[153] Additionally, on-site training of clinical researchers is tremendously valuable and is sorely needed. As an example, although India has more than 250,000 practicing physicians for more than 1 billion people, less than 200 investigators have been trained to carry out efficient, safe, and effective clinical research.[154] Proceeding in a phased way is a common sense approach. Case reports, limited then expanded retrospective studies, technical reports, and prospective studies using accepted statistical methods, and abiding by investigational review board standards and approval is the usual approach or sequence for young academic or investigational physicians. This includes ethics review, a favorable risk-benefit ratio, and informed consent. The revised Declaration of Helsinki in 2000 has defined this on the international level.[155] This revision declares that any treatment being tested in clinical trials should be compared with the best universal standard and not a placebo.

A subtle area not adequately covered in the U.S. or international standards is undue inducement.[156] Inducement includes money, availability of free treatment and drugs, or innovative unproven medical or surgical treatment when all present modalities have failed.

It is estimated that $75 billion per year is spent globally on medical research and development.[77] Only 10% of this money is spent on the healthcare problems of 90% of the world population. These "orphan diseases" have no profit incentive for commercial interests. The initiatives of the Gates Foundation in offering incentives to work in this area are encouraging.[77] The development of public-private partnerships (PPPs) for neglected disease has been well received.[157] This involves financial government/public health-driven cooperation with industry. Basically, public funding drives corporate research.

At the academic or voluntary level, establishing research units in the countries where the disease is rampant offers more practical and less time-consuming efforts. Again the Declaration of Helsinki[152] states: "The benefits, risks, burdens and effectiveness of the new method should be tested against those of the best current prophylactic, diagnostic and therapeutic methods." Further, "At the conclusion of the study, every patient entered into the study should be assured of access to the best proven prophylactic, diagnostic, and therapeutic methods identified by the study."

Nonsurgical Aspects

It is easy in the world to live after the world's opinion; it is easy in solitude to live after our own; but the great man is he who in the midst of the crowd keeps with perfect sweetness the independence of solitude.

Ralph Waldo Emerson

This aspect of international surgery growth is extremely important. Administration involves the strategy of identifying the opportunity, vision, design, mission statement, goals, implementation of the plan, and review. Politics involves the subjective aspects of relating and interacting with all the parties involved in the effort, emphasizing the development and sustainability of relationships. Logistics involves the tactical or managerial aspects of transfer and implementation of the plan or project.

Relationships

Relationships evolve from friendships, trust, and continuity of involvement. Developing a sense of respect and admiration for the patients we serve and the doctors and health/nonhealth workers we interact with is extremely important. Understanding their goals and desires is very relevant and helps up realize our own agenda. Guidelines about appropriateness, decisions, compassion, and listening to experienced people can be drawn from a variety of sources. The Book of the Samurai is 1 example[158]:

Appropriateness: "*When discussing things with someone, it is best to speak appropriately about whatever the subject may be. No matter how good what you are saying might be, it will dampen the conversation if it is irrelevant.*"

Decisions: "*It will not do to make rash judgments concerning good and evil. However, one should not be sluggish. It is said one is not truly a*

samurai if he does not make his decisions quickly and break right through to completion."

Compassion: "*Feeling the differences between oneself and others, bearing ill will and falling out with people—these things come from a heart that lacks compassion. If one wraps up everything with a heart of compassion, there will be no coming into conflict with people.*"

Experience: "*When you are listening to the stories of accomplished men and the like, you should listen with deep sincerity, even if it's something about which you already know. If in listening to the same thing ten or twenty times it happens that you come to an unexpected understanding, that moment will be something special. Within the tedious talk of old folks are their meritorious deeds.*"

Clearly the human factor accelerates this international equation. The ability to make friends, cultivate relationships, and avoid unnecessary "ego wars" is crucial to this whole process. Friendships and relationships are started and nurtured in many ways. There should be a balanced relationship, nurturing equality. Inequality in medical expertise and resources should not compromise the equality of the relationship. So too, with quality control, there should be a gradual process in emerging programs, recognizing that advancing to international standards takes time and patience. Many of these relationships occur during training where FMGs develop friendships with staff, fellow residents, and other medical and nonmedical people.

Ells and Caniano[159] offer an insight into the appreciation of the culture of the patients we treat. Although applied to immigrant patients in the United States, it equally applies abroad during voluntary, humanitarian efforts. This culture involves an appreciation of the beliefs, values, attitudes, and behavior patterns of the patients and their families. An indigent patient will refuse help if he/she/they do not trust or believe you. They may be desolate, but not desperate.

Language is a major problem/challenge in international voluntary work. A second language is a major advantage, especially in francophone (French speaking), as well as Spanish-speaking countries. At the physician level, it is not as difficult, but at the nursing level, and other health/nonhealth levels, it becomes more difficult. Handheld language computers and illustrative charts are helpful. In the operating room, hand signals are very useful.[160] Language or communication can be verbal or nonverbal. Mannerisms or tone of language are very important to understand and interpret. For the most part, the foreign hosts are very

sensitive to this. Congeniality and collegiality are critical factors to understand and practice abroad. Sometimes our frustrations and disappointments can be reflected nonverbally and interpreted in a variety of ways. It should always be remembered that we are their guests and we should act and behave accordingly. Complaining and arguing can, and should be done, in a patient/controlled/diplomatic fashion. They are very sensitive to our needs and feelings and, for the most part, are very appreciative of our efforts.

Last, relationships among volunteer team members merit consideration. The team concept is important to inculcate and practice. Cross-training and helping each other is crucial to a successful project or mission. Surgeons can wash and prepare instruments, clean the OR floor, start IVs, and assist nurses, and so on.

Political/Personnel Factors

A major political problem that parallels physicians emigrating to the United States for training and remaining are those physicians and healthcare workers emigrating to more favorable areas for both professional and personal reasons. Many would ask why volunteer to an area where everyone else involved in health care is leaving or wants to leave. One area of concern of this brain drain is the "poaching phenomenon." This is primarily seen with developed countries inducing and recruiting already well-trained and capable nurses from less developed, emerging countries to come and work and stay. Two areas must be approached and discussed. The first is to look at strategic/tactical ways to stimulate training and education of foreign students in healthcare areas needed. The second is to look at ways to keep foreign healthcare workers at home by making it more attractive to remain at home. The problem is real.[161] Almost 13,000 foreign nurses were registered to work in the United Kingdom during 2002 to 2003.[162] Nurse recruiters from the United States have ventured to Canada, Ireland, and the Philippines, recruiting nurses for needed positions in the United States. Work visas and green cards are accelerated for these needed jobs.

There are a variety of strategies to keep healthcare workers at home and, at the same time, maintain or improve job performance.[163] This is critical, since volunteer humanitarian efforts are not an endless endeavor. At some point programs end or taper off. Project Hope is a prime example of an NGO developing programs/projects that have a defined endpoint. It is difficult to keep flowers growing in a desert, or more tragically, in a garden with good soil, but no gardeners to till and nurse.

An interesting and innovative concept is to contract out healthcare

TABLE 24. Typical components and purpose of a business plan[165]

Component	Purpose
Executive summary	Create positive first impression that new service merits investment
Business concept	Describe current program and rationale for additional investment
Market analysis	Analyze demand for service and impact on safety, effectiveness, patient-centered care, timeliness, efficiency, and equitability
Competitive analysis	Discuss alternatives versus merits of proposed service
Business strategy	Determine and maintain differentiation
Financial plan	Project revenue and expenses of new service
Operations plan	Show how personnel, space, and equipment join together in a smoothly functioning program
Implementation plan	Deliver new service on time and on budget

initiatives. Countries with limited healthcare budgets can contract out services to foreign NGOs. It can be very effective with rapid improvements,[164] and is certainly a short-term initiative, until political/economic situations improve or stabilize.

Administrative

Administrative aspects of volunteer activity include establishing points of contact regarding volunteer activity, or addressing requests for help or assistance. Whether through friends, colleagues, or Internet sources, establishing a start is crucial to the process. Deciding on what you want to do, where to go, and for how long, and so on are important aspects. Learning the details and being able to study and compare options are basic. Once a project or mission has been selected, a series of conference calls usually occurs about the mission.

Political aspects of volunteerism again involve the human factor, or the ego part of the process. Establishing relationships with the host and donor team members is crucial to a successful mission. A business plan is sometimes needed, so that there is no misunderstanding[165] (Table 24). Sometimes contracts are called for. In a way, volunteerism is taking on a new job, except you do not get paid financially. Most doctors pay their own travel expenses, with local food/lodging provided. A practical plan for a new project/activity is illustrated in Table 25.

Personal considerations include being away from family and practice for varying periods of time. Personal healthcare issues should be addressed. Most NGOs require an application, curriculum vitae, and sometimes references, as well as a health statement. Credentialing and licensing is part of the process in many countries. This is an administrative area of voluntary humanitarian activity that is unchartered. This is the area of establishing the competency and qualifications of the volunteer.

TABLE 25. Project plan or initiative

Phase I. Preliminary plan
Make contact; respond to inquiry or invitation of host/contact program
Establish relationship or understanding
Feasibility study - Site visit
Proposal—3–5 year plan
Phase II. Specific proposal/plan
Gather team
Set date for implementation
Gather equipment/supplies
Shipment of equipment (20 foot container-surface/sea)
Screen/select patients
Team visit — first series of operations-low risk
Phase III
Identify host team members for on-site and donor site training
2nd team visit-more operations
Recruit to other donor teams
Phase IV
3–5 years-annual/semi-annual visits
Transition to host team
Donor participation-mentor, consultation
Ultimate limitations-politics, economics
Phase V
A. Donor Program obligations/commitments
Acceptance of a fixed number of patients from the host country to the donor country at no cost or reduced cost. This includes patients deemed high-risk or not suitable for host programs during the early stages
Donor program will provide observational and preferably hands-on training for selected medical team both short-term (1–3 months) and long-term (1–2 years) at the donor center.
Provide yearly team visits to the donor country to provide consultation training, clinical work that includes screening, evaluation, surgery, and postoperative care in collaboration with the host team.
Work to help with financial strategies that include grant funding, host government and private sector support.
B. Host program-obligations/commitments
Create an atmosphere of friendship and acceptance
Clear future bureaucratic obstacles (eg, passport, visa, custom problems, particularly for incoming equipment and supplies)
Provide housing, security for donor team on recurring basis
Recognize during screening of large backlog of patients that triage, although difficult, must prevail. All the cases cannot be done. Patience must prevail. Increased volume/complexity is a maturing process
Participate in the funding process and make transition to self-sufficiency

Unlike state licensure and hospital credentialing, which is standardized, there is no international system. Likewise, each country has its own mechanism, ranging from nothing to sophisticated, and is oftentimes a bureaucratic maze. As an example, Grenada requires a state license, and 2 letters of recommendation, all notarized. China, for a long-term project

(ie, >3 months), requires a work visa that includes a physical examination/testing, as well as a hospital license. It is important for all concerned that these issues be addressed by the sponsoring group/agency and the host program/country. Most of the experienced NGOs have developed a practical volunteer application system that addresses most of these issues.

In-country considerations include adequate housing, interpreters, local transportation, communication (eg, cells phones, pagers). Missing luggage is forever a problem. Registering with the U.S. Embassy, photocopy of visa/passport, and access to fax and e-mail are essential. Security is always an issue. Kidnappings, assault, and murder have all occurred. Sporadic violence should always be anticipated. In general, stay out of countries that the U.S. State Department has declared unsafe for travelers or has restricted travel.

Logistics/Equipment and Supplies

The logistical or tactical plan puts into play the strategic plan. On a practical level, all we are really trying to do is to transfer 3 basics components from the donor program to the host program: 1) information/ideas/technology/skills, 2) people, and 3) "stuff," equipment/supplies (ie, product—disposable or nondisposable). The Internet is the principal mode of transfer, along with fax, overnight express, cable, and phone. Transfer of people or personnel involves individuals or teams traveling to the host country or vice versa to the donor country. "People" also involves a job description or duties required. This involves the 3 Ps: project, practice issues, and personal preparation (Tables 26 and 27). Transfer of "stuff" is a more complex endeavor.

The surgeon should be involved in equipment/supply issues. Most surgeons bring their own special surgical instruments, as well as special suture and equipment items. All of this is relative to where you are going, what is available on site, and what you are being asked to do. Equipment and supplies come from 3 sources: it is already on-site having been procured locally; it was sent by airfreight or sea container prior; or it is hand-carried in piecemeal fashion by team members.

There is a continuous need for medical and nonmedical equipment as well as medical and nonmedical supplies. There are several NGOs with availability of medical equipment and supplies that are donated or available for purchase at discounted rates. It is extremely important not to expend wasted efforts and gathering worthless or unneeded product. It is expensive and labor intensive to gather and transport product. Historically, product is donated and distributed to host programs and projects. The usual sources are hospitals and companies with product that is

TABLE 26. Surgeon's checklist

A. Practice considerations
Working conditions
Equipment/supplies
License requirement/malpractice
Documents—passport, visa, work permit
B. Immunizations or prophylaxis
Yellow fever
Smallpox
Hepatitis A and B
Malaria (prophylaxis)
Cholera
Measles, mumps, rubella, poliomyelitis, tetanus, diphtheria, pertussis
Rabies
Endemic areas — typhoid, BCG, meningococcal meningitis influenza, Japanese encephalitis
C. Issues
Insurance (life; health; evacuation)
Security (US Dept. State: Embassy; Consulate)
Communication—home; hospital; call schedule
Language—hand signals
Culture/social/etiquette
Environment—climate/terrain—prepare accordingly
Living/lodging conditions
D. Sickness/disease
Dengue
Diarrhea
Hepatitis A
HIV
Motion sickness
Climate extremes
Cold
Heat
Altitude
Diseases—(acquired; chronic illnesses) (personal medications)

expired or being phased out. The gathering process involves shipping or transferring product to the donor base with ultimate transfer to the host site either by air or sea routes. It can travel with the individual or go separately. The donation is tax-deductible if given to NGOs, as are most financial contributions. The major factors to consider in soliciting for product are summarized in Table 28.

Product is categorized into equipment/supplies, medical/nonmedical, disposable/nondisposable, and organic/inorganic. Drugs and pharmaceuticals are separate and require special consideration, especially with respect to narcotics.

It is clear that donations are becoming more difficult to procure, given

TABLE 27. Surgical challenges

Inadequate infrastructure
Personnel problems
Equipment/supplies
Personal hardships
Lodging; amenities
Climate
Food
Language
Patients
Surgical problem beyond capability of surgeon secondary to lack of skill/experience, facility, help/support, equipment/supplies
Language
Customs/social issues
Corruption/suspicious activity
Dangers
Accidents
Crime
Terrorism
War/conflict
Burn out/frustration

TABLE 28. Product procurement

- Identify reliable sources—companies, individuals, NGOs
- Be specific about the needs
- Inventory product
- Provide adequate storage—climate controlled; security; easy accessibility; facile transfer system-loading dock; minimize labor intensive efforts
- Work with experienced groups organizationsinvolved with international transport (see Appendix)
- Share and trade with other groups/organizations
- Most countries require FDA or CE approval*†

*FDA provides certificate for foreign governments (www.fda.gov/cdrh/).
†CE (Conformite Europene) is the European proof of standardization/conformity. It represents the minimum safety requirements of the 15 European Union (EU) members (www.export61.com/export-tutorials.asp?ttl=eteu).

the increased demand, and the waning economy. Consideration should be given to developing collaboration with other groups to form cooperatives that can approach companies and vendors to purchase at discounted prices.

It is extremely important to determine your needs, and to bring/use those items necessary to complete the task or mission. It must also be stressed that free product is not an endless chain. At some point, a transition must be made with corporations or distributors, to buy locally

at discount, and eventually at full market value. Most projects make this transition within a 3- to 5-year timeframe.

It is accepted that knowledge, skill, experience, and judgment are key components in surgical problem solving, but without the instruments, equipment, and supplies to facilitate the task, the problem remains unsolved. Product is an important aspect. Historically, most volunteer efforts have involved donated product that is sent before the mission or carried along with the individual or team. It is generally donated or purchased at discounted prices. Several major problems may be encountered with product. First, used or rehabilitated equipment requires maintenance and biomedical preventive care. Parts and local expertise in repair are usually nonexistent or unavailable. Second, donated product must clear customs. Sometimes this is an arduous task. Paying customs fees/charges seems ludicrous, but it is a reality in most countries. Hospitals may be penalized for accepting donated goods. Their budget may be decreased since they are getting "free product." Last, local distributors may complain to the hospital. There are several possible and proven solutions to these problems. First, use only practical durable equipment that is new or rehabilitated. Service manuals must be supplied. Train local biomedical personnel where possible. Second, arrange a clear system regarding customs charges exclusion criteria negotiated before entry, especially with drugs (certainly narcotics). Third, government- or state-subsidized hospitals/clinics must not penalize local budgets. Last, work out a "deal" with distributors. The donation cycle is temporary (ie, 3 to 5 years at most, followed by a discounted arrangement with local distributors, then full value or negotiated prices).

The donation or purchase of equipment and supplies requires an organized system. Most experienced NGOs have created a network of contacts for donations. They are, in general, very protective of these sources. Items are collected, inventoried, and stored for their own use, and sometimes shared with other groups. The era of donated product is closing rapidly. Economic constraints have hampered the effort. Now, NGOs are forming cooperatives to approach corporate sources for markedly discounted prices on bulk items. Donation or purchase of "junk equipment" is a terrible waste of time and money. There are several NGOs that collect and rehabilitate old equipment and make it available to other NGOs at very reasonable prices. There are NGOs involved with shipment as well. Shipping a 20-foot container from the United States to any foreign part in the world costs, on average,

between $4000 and $7000. One of the most valuable personnel on any surgery-oriented mission is the biomedical engineer.

An area related to disposables that is sometimes overlooked is how the "disposables" are disposed. Most emerging economies have not established protocols for biohazardous material. In many countries uncontrolled burning, or simple burying of product, is the routine. This is highlighted in Haiti, where open burning of disposables is performed, as well as unburned burial of plastic disposables such as chest tube drainage containers, PVC tubing, and oxygenators.

Although disposables cannot be reused in the United States, such is not the case in some countries. As an example, cannulas for cardiopulmonary bypass are reused following gas sterilization. Expired items are also an area to address. Countries such as Russia, China, and Vietnam prohibit the use of expired items. An example is the use of expired bioprosthetic heart valves. Surgeons should consider the purchase of less expensive surgical instruments with reasonable quality from countries such as India and China.

Probably, the most frustrating aspect of "product" is the bureaucratic and sometimes corruptive practices that occur once the product reaches the host country. This is especially true for ocean transport containers that may lie dormant for weeks/months, on the host country dock, awaiting custom clearance.

There are tactical aspects of equipment/supplies/product to consider at the donor level[166,167]: recovery, storage, rehabilitation, repair, resterilization, inventory, donation, and accountability. Recovery involves gathering equipment/supplies from a variety of sources (individuals, groups, institutions, corporate). Once received they must be stored, usually in a warehouse that is large, climate controlled, and with a capability for moving. Rehabilitation/repair is a difficult process, requiring biomedical support and cannibalization to recover usable items. Resterilization is a controversial area, but there are guidelines regarding recycling, especially in cardiac surgery. Inventory of product is crucial. Donation of available items is usually to other NGOs with documented needs and projects. Accountability involves documentation that the product reached the site and was used in the manner outlined or directed. The REMEDY (recovered medical equipment for the developing world) program (www.gasnet.org/sremedy) is a good source for knowledge and experience in this area.[166,167] The IMEC group (international medical equipment collaborative; www.imecamerica.org/aboutus.cfm.) uses a 5-step process to product delivery[168]: step 1, identification of project

over 3- to 5-year period; step 2, assessment or feasibility study on site of project; step 3, fulfillment with needed product; step 4, delivery to site, usually by sea container; and step 5, installation of product on site.

Acquisition of needed drugs, particularly narcotics, is difficult. Basic bulk drugs from the WHO are usually limited to large-scale efforts.[169] There are many discount drug houses with markedly reduced purchased drugs. Heavy items, such as IV solutions, are better purchased or procured locally.

Individual Volunteer Aspects/Concerns

For those embarking on a volunteer experience, the first consideration is whether it will be at the local, state, regional, national, or international level. One does not have to venture far from home to volunteer for medical or nonmedical services. Coaching a little league team is just as satisfying and contributory as venturing off to a war-torn area with Medicine sans Frontiers (Appendix 1).

Most international volunteer efforts are short-term (<2 weeks). The International Medical Volunteers Association (www.imva.org) has a very practical approach with invaluable information.[170] The major questions are addressed. There are several NGOs involved in surgical areas. Operation Giving Back provides several organizations to explore (www.operationgivingback.facs.org).[15] Once a group or organization is identified, it is prudent to inquire further from individuals involved with that group, and to look it up on Guide Star (www.guidestar.org). This site provides valuable information about NGOs. Most health-related NGOs are registered with Guide Star (www.guidestar.org), and still others are registered as private voluntary organizations with USAID.

Probably 1 of the most important areas of concern for surgeons is the area of licensing, credentialing, and malpractice internationally. It is extremely important to know and prepare for these 3 areas when working abroad. Security and personal health are likewise important. When working in a war or conflict zone, it is imperative to check with your life insurance company regarding a "war clause."

Surgeons should consider taking some of their own surgical instruments, depending on the type of surgery or locale they are working in. The basic checklist for operating rooms is summarized in Table 29.

Appendix 2 summarizes useful contacts for preparation for volunteers, especially for those embarking on solo or first-time initiatives.

TABLE 29. Basic checklist for operating rooms

- Bricks/mortar - a suitable structure in which to work; keep in mind building codes vary
- Infrastructure
  Electricity—backup generator/battery supply
  Water
  Heating/cooling
  Ventilation
  Oxygen
  Vacuum
  Compressed air
- Basic equipment
  OR bed—usually manual operated
  Anesthesia machine—scavenger system
  Multiparameter monitor
  Cautery/ground plate/disposables
  Suction × 3 (anesthesia/operative field/chest tubes)
  Sterilizer (steam/gas)
  OR light or headlight
  Surgical instruments—basic/special
- Supplies
  Access—IV—peripheral/central
  Anesthesia—airway/drugs
  Prepping solution
  Surgical drapes (cloth/disposable)
  Nasogastric tubes
  Foley/drainage
  Chest tubes/drainage
  Suture—specific to procedures anticipated
- IV fluids (heavy; bulky; usually procured locally)
- Drugs, especially narcotics—basic drugs; cardiac
- Blood bank support—type specific or cross match capability
- Basic laboratory support—clinical tests/pathology (anatomic)

Specific Areas of Interest

Disasters/Emergencies

Disasters, be they natural, manmade, or varying combinations of both, are a major area in which local, state, regional, national, or international calls for volunteers are required, needed, and requested. The global mortality for natural disasters is usually underestimated.[171] Unfortunately, the United States has lagged behind other nations in disaster planning and relief. The recent response to Hurricane Katrina is an example of less-than-ideal response at all levels, but particularly at the federal level. The role for general surgeons and surgical specialties is varied. Despite basic training and experience with trauma at the ATLS level, the needed skills and knowledge at a multitrauma level require a basic change in focus. Whereas the focus on the sickest most traumatized

patient(s) is clearly logical, the triage approach of concentrated care of the least injured at the mass casualty, multitrauma level requires a reorientation and reevaluation of current training systems. Volunteering in this area requires 3 essentials: an interest and desire to get involved; a search for opportunities to gain basic knowledge and skills in this area; and volunteer with established individuals, groups, organizations, or institutions (Appendix 3).

Unfortunately, the role of surgeons in trauma has been diminished or diluted with the emergence of emergency room physicians. In the emerging economies, trauma remains a major issue, particularly blunt trauma. In emerging or catastrophic disasters such as the tsunami or Hurricane Katrina, the role of surgery is primarily triage and the care of sequelae of the acute event. Volunteer efforts are usually planned (ie, designated teams with volunteers ready to be deployed). The National Disaster Medical System (NDMS) is a planned response system to provide emergency medical assistance. It has 3 primary objectives: to provide health-related care and services; to evacuate patients to locations outside the epicenter of the event; and to provide hospital care in government and nongovernment hospitals that are part of the network. The Disaster Medical Assistance Teams (DMATs) are groups of medical personnel set up to respond to disasters or unusual events. Composed of approximately 35 individuals or more, they are rapid response and provide primary care or augment local staff.[172]

Carried further, a mass-casualty incident medical response includes: search and rescue, triage and initial stabilization, definitive care, and evacuation out of the region for specialized or long-term management/rehabilitation. Natural disasters, however, must be distinguished from complex emergencies. These tend to be larger in scale and last longer. They also involve military strife, displacement, migration, and all of the sequelae of refugee living, particularly in austere climate and terrain situations (eg, the recent earthquake in Pakistan).

The WHO has established 10 core health issues in emergency/disaster scenarios, be they manmade or natural.[173] Briggs and Brinsfield[179] have published a useful manual for disaster medical response. For surgeons, the triage scheme proposed is very practical (Table 30).

Triage is an important area to reflect on. In mass-casualty situations triage is readily adapted and used. In chronic situations it becomes more difficult and sometimes emotionally painful. Seeing a large volume of needy patients with varying degrees of disease complexity requires full use of the surgeon's objective and subjective talents. Recognizing the limitations of the initiative is paramount. Better not to operate than to do

TABLE 30. Triage levels[174]

On-site triage (level 1)

- Rapid categorization of victims with potentially severe injuries needing immediate medical care "where they are lying" or at a triage site
- Personnel are typically first responders from the local population or local emergency medical personnel
- Patients characterized as "acute" or "nonacute"
- Simplified color coding may be done if resources permit: acute = red, nonacute = green

Medical triage (level 2)

- Rapid categorization of victims at a casualty site by the most experienced medical personnel available to identify the level of medical care needed
- "The greatest good for the greatest number of people"
- Knowledge of the medical consequences of various injuries (eg, burn, blast, or crush injuries or exposure to chemical, biological, or nuclear weapons) is critical
- Color coding may be used:

RED	URGENT	Casualties who require immediate life-saving interventions (airway, breathing, circulation)
YELLOW	DELAYED or EXPECTANT	Casualties who do not require immediate life-saving interventions and for whom treatment can be delayed. Casualties who are not expected to survive due to the severity of injuries complicated by the conditions and lack of resources
GREEN	MINOR	Individuals who require minimal or no medical care
BLACK	DECEASED	

Evacuation (level 3)

- Level 3 triage assigns priorities to disaster victims for transfer to medical facilities
- Goal is appropriate evacuation (by air or land) of victims according to injury severity and available resources
- Same medical personnel as in level 2 triage

too complex an operation or leave without adequate follow-up or care. Better to leave them with hope, rather than desperation.

Military

Voluntary efforts in wars and armed conflicts are of 2 varieties: joining the U.S. military and volunteering for service in war-torn regions such as Bosnia and Iraq, or volunteering again with civilian groups such as Doctors Without Borders. In 2000 there were 35 wars and 47 armed conflicts ongoing globally.[175]

The primary mission or role of the U.S. military, or any national military force for that matter, is to defend and uphold the national interests of the country it serves. The military medical mission is to preserve the fighting force by assuring and maintaining the individual soldier, seaman, or airman to be fit to fight and deployable worldwide.

The military is the most suitable and qualified to handle emergency and disaster situations. In addition to its combat mission is the peacetime mission to provide care and services to active duty personnel, active duty dependents, retirees, and retired dependents. Whether in wartime, peacetime, or manmade or natural emergencies/disasters, the military health team has provided assistance when directed. The humanitarian aspect of the military healthcare mission is well recognized, but not widely known in the civilian sector. Inspired by such individuals as Dominique Jean Larrey, Napoleon's surgeon, humanity on the battlefield has been extended to treat all battlefield wounded with excellent care, regardless of their status (ie, military or civilian). There are countless examples of medical humanitarian efforts associated with both wartime and peacetime missions.[176]

Recent humanitarian military operations include Operation Provide Hope to Rwanda, Operation Restore Hope to Somalia, and recent missions for Hurricane Katrina and the tsunami tragedy in Southeast Asia.

With the end of the military draft in 1973, and the exhaustion of the Berry Plan physicians program, military medicine has depended on volunteers. The majority of military physicians are products of the military scholarship programs, with varying obligatory active duty time. It is not surprising that the present generation of civilian physicians have no experience or knowledge of military medicine. A military background or experience offers valuable insight into the area of voluntary humanitarian efforts. Organization, planning, logistics, and execution are integral components of humanitarian projects/missions. A few examples are provided in Table 31 that may be of value in present or future efforts.

The major development in military combat medical care has been the evolution of mobile rapidly deployable medical units. Knowledge of the deployable medical system is beyond the scope of this review, but a basic knowledge and insight may be of value to those individuals or teams planning activity in austere or remote regions. Visiting a local medical reserve or National Guard military unit may be tremendously valuable in this regard.

The spectrum of combat injuries in modern conflicts is interesting and has application in civilian trauma scenarios.[181] Through November 2004, more than 10,000 service men suffered war injuries in Iraq, of which 1361 were killed in action (KIA). The lethality of war wounds has decreased progressively from 42% in the Revolutionary War, 33% in the Civil War, 30% in World War II, 24% in Vietnam, and now 10% in Iraq/Afghanistan. More than 66% of injuries in Iraq are secondary to improvised explosive devices, shrapnel, or explosions and 16% are

TABLE 31. Issues related to military missions

- Development of regional medical team concentration in a particular country or region.[182] This requires extensive knowledge and insight into that particular area (eg, tropical medicine, public health, language, climate [altitude/cold/hot/tropical/maritime/temperate], and terrain). Insight into local politics, economics, social, and demographics are essential.
- Sustained involvement. US military has provided local care to civilians ever since the Revolutionary War. However, there must be a contingency plan to provide care after the troops come home. The experience gained from the Medical Readiness Training Exercise (MEDRETE) is a notable example.[177] Short-term medical teams are embedded into an area to provide basic primary care. They highlight some of the deficiencies of short-term efforts: short amount of time (usually 1–2 wks), lack of follow-up, large numbers of patients with empty promises, lack of diagnostic support, limited medications, language barriers, and unfamiliarity with local culture, diseases, and healthcare system/standards.
- Aeromedical evacuation and shipment of medial supplies. Most civilian voluntary groups are not involved in aeromedical evacuation, but a basic knowledge of flight medicine is worthwhile, especially for teams traveling long distances.[178] Shipment of medical supplies for civilian humanitarian efforts is not well known. The Denton Program (http://www.dentonfunded.com/AboutDenton.htm), which is administered by USAID, allows humanitarian equipment/supplies to be shipped on military aircraft to support a variety of projects and missions to countries in need.
- Planning a medical relief mission. The logistics of planning and executing a mission is everyday language to the military. A recent military experience illustrates the type of diseases encountered.[179] Highlighted is the number of orthopedic problems (>30%) encountered.
- The wartime experience of delayed wound closing, or delayed primary closure (DPC), has relevance in the austere surgical environment.[180]

secondary to gunshot wounds. Protective body armor, advanced care at the site of injury, rapid evacuation, and advances in multiple trauma care have contributed to the decreased lethality of injury. Lessons learned in the military have permeated civilian practice and certainly volunteer efforts. The specialized units of World War II, the aggressive approach to vascular wounds in Korea, and the understanding of adult respiratory syndrome (Da Nang Lung) in Vietnam are but a few of the military surgical contributions. The forward surgical team (FST) concept in Iraq has already shown its effectiveness.[97] The FST is composed of 10 officers and 10 enlisted personnel: 3 trauma surgeons, 1 orthopedic surgeon, 2 nurse anesthetists (certified registered nurse anesthetists), 3 clinical nurses, and 1 operations officer. The team is designed to perform 30 operations over 72 hours. This exhausts their equipment/supply capability. The design and concept has practical application in clinical scenarios.

A significant contribution from the military in the recent Iraq conflict is the continuity of care beyond the battlefield. Peake[178] highlights the continued follow-up care of the wounded soldier physically, mentally, and emotionally.

Epidemics

One of the extraordinary things about human events is that the unthinkable becomes thinkable.

Salman Rushdie

Although renegade efforts of nuclear, biological, chemical attack remain possible sources of epidemic catastrophes, the global nuclear threat of the Cold War era is over. Infectious etiologies such as the SARS situation in China and the recent emergence of variant strains of influenza (H5N1 virus) make the entire human population vulnerable to endemic and, in fact, epidemic catastrophes in terms of disabilities and loss of life.[183] In addition to wars/conflicts, terrorism, poverty, hunger, and natural disasters are these new diseases as well as the re-emergence or increase in older diseases such as tuberculosis, especially the more virulent multi-drug-resistant strains. Certainly, larger populations, and greater worldwide population and product mobility and transfer have accelerated these phenomena.

The WHO has established broad-based initiatives to plan for and react to global epidemics.[184] The United States has established an overall surveillance and response system for infectious diseases. The Department of Defense-Global Emerging Infections System established in 1996 has developed efforts to coordinate and improve preventive health programs and epidemiological capabilities, with increased military participation at home and abroad.[185]

The role of surgeons in epidemics is unclear or limited. A basic understanding of epidemics is necessary in the wake of disasters. Primary epidemics are related to infectious diseases (eg, SARS). Secondary epidemics following natural or manmade disasters include infectious diseases (eg, cholera, diarrhea) that are due to disruption of infrastructure (sanitation, contaminated water). These are part of the newly recognized complex emergency situations.[186] These are acute situations that occur in natural or manmade events or disasters and affect large populations over large or small geographical areas. In addition to the acute event, the sequelae of communicable diseases, climatic changes, migration, refuges, and food shortages compound the situation over varying periods of time. The tsunami catastrophe in Southeast Asia and the Pakistani earthquake are present examples of complex emergencies. It should be stressed that it is the combination of communicable diseases, along with malnutrition, that account for the majority of deaths in these complex emergencies. Again the preventive measures take precedence. These include site planning, clean, potable water, sanitation, nutrition, immunization, vector

control, personal protection (shelter, nets), personal hygiene, health education, and disease treatment.[187]

Domestic/Home/National

The thrust of this monograph has been international/foreign/abroad activities. Yet there is a need for national/domestic/home activity here in the United States. Several volunteer activities are available for general healthcare needs, such as homeless indigent care services and care for prisoners. Efforts are being made by some states to offer malpractice coverage to retired physicians wanting to volunteer at local or state levels. Other states have adopted charitable foundations, including volunteer initiatives (eg, the Massachusetts Medical Society and Alliance [http://www.massmed.org/]). Many hospitals and academic centers offer free care and oftentimes support local voluntary agencies. What is most needed is increased volunteer activity at the various political levels to effect changes to alleviate or eliminate the root causes of these domestic health problems, using preventive or curative measures.

Epilogue

It is amazing what you can accomplish in life, when you don't mind who gets the credit.

Harry S. Truman

American surgeons stand at a unique point in history. As the wealthiest and most successful country in the history of the planet, we have been afforded the opportunity to learn, develop, practice, and teach our craft to the benefit of students, residents, fellow colleagues, patients, and our families. Now we can extend this gift to others, at home or abroad, combining both the idealistic tenets we honed and developed through the educational process with the practical everyday experience of surgical practice.

The development and cultivation of friendships and relationship with fellow colleagues is 1 of the most gratifying aspects of volunteer efforts. Health and education are 2 of the basic needs common to all parents raising children. Working at the grassroots levels, generations of selfless medical volunteers have won the trust and admiration of people around the world. American health care is admired and respected in most countries of the world. Cultivating and promoting this is the responsibility for all those engaged in medical voluntary/humanitarian activity.[14]

Appendix 4 summarizes the major questions to answer or approach when considering volunteer/humanitarian efforts.[1,2,3,4,5,6,10,11,12,13,16,17,108]

I keep six honest serving-men (they taught me all I know). Their names are What and Why and When and How and Where and Who.

Rudyard Kipling

Appendix 1

Volunteer Opportunities

Diversion Magazine
www.diversionmag.com/volunteerlist.asp
International Medical Volunteers Association (IMVA)
www.imva.org/
Operation Giving Back - American College of Surgeons
www.operationgivingback.facs.org/
JAMA Career Net
Volunteer Services
http://jamacareernet.ama-assn.org/misc/volunteer.dtl
Health Volunteers Overseas:
Source of Guide for Volunteering Overseas
www.hvousa.org/osgap.cfm
Global Health Council
www.globalhealth.org
Medecins Sans Frontieres - Doctors without Borders
www.msf.org
Canadian Society for International Health (CSINH)
www.csih.org/who/who.html
The Canadian Association of General Surgeons
www.utoronto.ca/ois/CAGS/volunteering.htm

Appendix 2

Pretravel Resources for Healthcare Professionals

Interactive Web-Based Sources

Centers for Disease Control and Prevention Travel Information
http://www.cdc.gov/travel
World Health Organization International Travel
http://www.who.int/ith/en/
Health Canada Travel
http://www.TravelHealth.gc.ca
UK National Travel Health
http://www.nathnac.org/healthprofessionals/index.html
Malaria Maps
For information, contact listserv@wehi.edu.au

Surveillance and Outbreak Information

Morbidity and Mortality Weekly Report
http://www.cdc.gov/mmwr

Weekly Epidemiological Review
http://www.who.int/wer

EuroSurveillance Weekly
http://www.eurosurv.org/update

Canada Communicable Disease Report
http://www.hc-sc.gc.ca/hpb/lcdc/publicat/ccdr

Travel Medicine Information

TravelMed, sponsored by the International Society of Travel Medicine
www.istm.org

Medical Assistance and Physicians for Travelers:
International Society of Travel Medicine
http://www.istm.org

International Association for Medical Assistance to Travelers
http://www.iamat.org

US Department of State
www.travel.state.gov/medical.html

CDC Health Info for Travelers/vaccinations
www.cdc.gov/travel/yb/toc.htm
www.cdc.gov/travel/vaccinat.htm

MD Travel Health
www.mdtravelhealth.co

Travel insurance
www.missionaryhealth.comwww.internationalsos.com

Books

Travel & Routine Immunizations. Milwaukee, Wis: Shorland; 2002

Red Book Am Acad of Pediatrics, 26th ed. Elk Grove Village, Ill: American Academy of Pediatrics; 2003

Travel Medicine. Philadelphia, Pa: Mosby; 2004

A World Guide to Infections. New York, NY: Oxford University Press; 1991

Travel Medicine Health 2001. 2nd ed. London, England: Decker

Tropical Infectious Diseases. Philadelphia, Pa: Churchill Livingstone; 1999

Manson's Tropical Disease. Edinburgh, Scotland: Elsevier Science Ltd; 2003

Hunter Tropical Medicine. Philadelphia, Pa: Saunders; 2000

Textbook of Tropical Surgery, R. Kamel, J. Lunley, ed. Westminster Pub: Co. 2004

Additional Books (www.imva.org)

Cook, John, Sankaran, Balu and Wasunna, Ambrose E.O, eds., **General Surgery at the District Hospital** (Geneva: World Health Organization, 1988), Index, Illustrations, pp. 231.(ISBN 92-4-154235-7). One of 3 handbooks published by WHO for the guidance of doctors providing surgical and anesthetic services in small hospitals subject to constraints on personnel, equipment, drugs and access to specialized services. The book outlines surgical procedures for the face and neck, chest, abdomen, GI tract, and urogenital system. Pediatrics is treated in a special section. Numerous superb illustrations clarify procedures for those who have had little formal surgical training.

Cook, John, Sankaran, Balu and Wasunna, Ambrose E.O eds. **Surgery at the District Hospital: Obstetrics, Gynaecology, Orthopaedics and Traumatology.** Geneva: World Health Organization, 1991) Index, Illustrations, pp. 207. (ISBN 92-4-154413-9). The first section on ob/gyn procedures deals with treatment of the major complications of pregnancy and childbirth. The second section covers both basic orthopedic techniques and management of specific fractures, dislocations and other injuries including burns. Numerous superb illustrations clarify procedures.

Dobson, Michael B., **Anaesthesia at the District Hospital** (Geneva: World Health Organization, 1988) Index, illustrations, pp. 143. (ISBN 92-4-154228-4). One of 3 handbooks published by WHO for the guidance of doctors providing surgical and anesthetic services in small hospitals subject to constraints on personnel, equipment, drugs and access to specialized services. This book covers the immediate and continuing care of critically ill, unconscious, or anesthetized patients and principles of fluid and electrolyte therapy. Special attention is given to pediatric and obstetric anesthesia. The wealth of illustrations is intended to help the medical officer in a small hospital, finding him/herself responsible for providing anesthesia for both elective and emergency surgery.

King, Maurice, ed, **Primary Anesthesia** (Oxford: Oxford, 1986) Index, illustrations, pp. 169 (paperback, ISBN 0 19 269051 5). This manual of anesthetic methods is intended for non-specialists working in developing countries or in emergency situations. Many methods of local and regional anesthesia, intubation, and the use of relaxants are discussed. Directions

on improvising equipment like vaporizers and "making your own intravenous fluids" included.

King, Maurice; Bewes, Peter; Cairns, James; and Thornton, Jim, eds., **Primary Surgery, Volume One, Non-Trauma** (Oxford: Oxford, 1990; corrected, 1993) Index, illustrations, pp. 642 (paperback "low-priced edition" ISBN 0-19-261694-3). Designed for doctors working in developing countries, this impressive volume clearly illustrates methods on procedures from conventional problems like Cesarean section and the resection of dead gut to tackling tropical diseases like leprosy and elephantiasis. Geared toward the generalist who has never performed any of these procedures before.

King, Maurice and Bewes, Peter eds., **Primary Surgery, Volume Two, Trauma** (Oxford: Oxford, 1987; corrected, 1993) Index, illustrations, pp. 389 (paperback "low-priced edition" ISBN 0-19-261598-X). This complete and detailed system of trauma methods is geared toward the non-specialist physician confronted with having to do an amputation or emergency eye surgery for the very first time. Special sections on treating fractures and burns.

Rigal, Jean, ed. **Minor Surgical Procedures in Remote Areas** (Paris: Médecins Sans Frontières, 1989) Index, illustrations, pp. 173, (ISBN 2-218-021663-3). This outline/cookbook format handbook uses very simple illustrations and text to distill Médecins Sans Frontières' experience in the "most frequent and useful minor surgical procedures practiced by doctors and nurses in remote areas with poor sanitation and no surgical or radiographic equipment." Intended for use in rural hospitals, dispensaries, and refugee camps, this book has appendices which list supplies, equipment, and disinfection and sterilization techniques. Durable, waterproof cover. Dimensions 6" × 8.5".

Appendix 3

Disaster/Emergency Organizations

International Global Disaster Emergency Management Organizations
www.disastercenter.com/intern.htm

Disaster Relief Agencies
www.disastercenter.com/agency.htm

National Voluntary Organizations Active in Disaster (NVOAD)
www.nvoad.org

Medecins Sans Frontiers
www.msf.org

Bilateral Agencies

United States Agency for International Development (USAID)
Major funding agency for U.S. foreign aid
www.usaid.gov/

Refugees/Immigrants

US Committee for Refugees and Immigrants
www.refugees.org

Appendix 4*

Final Checklist/Thoughts

Why Volunteer? - A few reasons
- Want to help
- Do something important
- Assist those in need
- Alleviate pain/suffering
- Loss of home appeal
- Need revitalization from home practice/job
- Religious convictions
- Cannot go, but want to donate money
- Exposure to challenge and problems
- Commitment to the underserved
- Adventure of travel and experience of people/culture
- Chance to learn new skills and teach others
- Feeling of guilt to do something

Who - is needed
- to contact
- pays

How - long
- to get involved
- to prepare
- to cope
- to understand
- to adapt/adjust

When - to go - time of year
- stage in career

What - to do
- to know
- are the qualifications/skills needed
- to bring

- to expect
Where - to go

*http://www.imva.org

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