GLOBAL HEALTH

Bringing Radiation Therapy to Underserved Nations: An Increasingly Global Responsibility in an Ever-Shrinking World

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Received Mar 26, 2014, and in revised form Mar 27, 2014. Accepted for publication Mar 27, 2014.

Early in my career, I had the great privilege of working first for a year as a medical student in Nigeria and then as a sub-intern in Sierra Leone. With 30 years of perspective, I can now see how little I gave in comparison to how much I gained. To a completely unanticipated extent, my personality, my politics, and my practice were shaped by the great vitality and the profound poverty of West Africa. It was always my intent to return and make a career there, but it never happened, as the winds of chance and opportunity blew me in a different direction. The longing to assist in some meaningful, practical, and sustainable way has, however, remained within me, and I know that I am far from alone. Many practicing oncologists who have had comparable experiences, and many of those who have not, wish to help solve problems that they have witnessed either first-hand or in an endless parade of misery across their television screens. As the communication and information revolution shrinks our world, the difference between those who have and those who have not increases, but so does our power to organize and to aid. This edition of the Red Journal brings together a collection of articles that describe the size and shape of the emerging cancer crisis in the low- and middle-income countries (LMICs).

As AIDS settles into an endemic state, and as infectious diseases are better prevented and treated, so cancer grows as a concern. The vitally important role of radiation therapy in either curing or palliating the common cancers of the LMICs, cancers of the cervix, nasopharynx, breast, esophagus, and lung, scarcely needs stating—yet its underuse is staggering. These articles spell out clearly the formidable proportions of the problem and, by implication, the depth of our responsibility. They make suggestions and give pragmatic examples as to how we might organize the pool of willing human talent to begin to meet these urgent needs.

We begin by first attempting to get a sense of the scale of the challenge that we face globally. Datta et al use the World Bank classification to define 139 LMICs and look at the details of their radiation therapy facilities and staffing using the International Atomic Energy Agency—Directory of Radiotherapy Centers (IAEA-DIRAC) database (1). They then measure the numbers of these nations currently meeting the recommendations laid out by the IAEA and the European Society for Radiotherapy & Oncology - Quantification of Radiation Therapy Infrastructure and Staffing Needs (ESTRO-QUARTS), projecting ahead to the shortfall anticipated by 2020. The numbers beggar belief. Of the 139 nations, only 4 currently meet their needs, and 55 actually have no radiation therapy at all. Among the remaining 80 nations, access runs at a median of 37%. By 2020, the world will need more than 9000 new radiation teletherapy units, 12,000 more radiation oncologists, 9000 physicists, and 29,000 radiation therapists. There is no single solution to fill this gap, and creativity will have to be harnessed as much as human and economic capital.

There can be little doubt that the governments of the high-income nations have a huge role to play in terms of financial aid, but they often have a simplistic view, directing financial aid to their LMIC counterparts without accountability or focus. The President’s Emergency Plan for AIDS Relief (PEPFAR), an initiative launched by US
President George W. Bush, is a notable exception and a bright mark on his legacy. Sadly, however, there has been a long history of aid dollars poured into unchaperoned assistance and into the black hole of corruption. At the highest level the IAEA, the Union for International Cancer Control (UICC), and the World Health Organization (WHO) have worked with many national governments and stakeholders to identify cancer as an area of growing concern, to assess future needs, and to develop programs. They are now advocating for an expansion of radiation therapy services along with a more comprehensive program of cancer prevention and care, including antismoking education, human papillomavirus immunization, surgical services, and chemotherapy.

Unfortunately, even if services are provided, the cost to patients and their families may be prohibitively high in nations without a social security system. The pharmaceutical vendors of highly active antiretroviral therapy (HAART), used to combat AIDS, have had their arms twisted to provide drugs at cost price, or lower, in many nations in Africa. Could such a strategy work in radiation therapy? If there is the will, there may be the way. Major charitable bodies, such as the Gates Foundation, are deeply invested in finding cures for some of the gravest medical problems of the developing world, including AIDS and malaria (2). It is hoped that their attention will, in time, be captured by cancer.

In the absence of an active funding program focused on cancer and especially radiation therapy, what can be done to at least begin to address the need? Our specialty’s professional organizations have a responsibility and are waking up to this. ESTRO is, by its nature, a multinational organization and one that must deal with many nations with a range of technological capabilities. Their leadership has strategically broadened the scope of ESTRO’s educational initiatives well beyond the European boundaries, and they must take credit for this. The American Society for Radiation Oncology (ASTRO), by contrast, is an organization that was created to focus on the affairs of a single nation with a population of 307 million, and to conduct its educational efforts alongside a huge weight of additional responsibility that includes governmental and public advocacy, health policy development, and the complex economic battles unique to the United States. It has, for several years, had a small international committee dedicated to providing faculty to 3 educational meetings a year around the globe. This has been a noble effort, but it is, in the grand scheme of things, just a drop in the ocean.

ASTRO has now reorganized, developed its own strategic plan, and described its intentions and new activities in the article by Mayr et al (3). Although ASTRO and ESTRO can never, by themselves, solve any of the manpower and equipment shortages in the developing world, they can become the repositories for up-to-date and relevant education in the form of podcasts, webcasts, and electronic media. Their websites and meetings can also become the clearing-houses or hubs for other volunteer projects such as equipment exchanges, or for matching willing volunteers and donors with centers in need. ASTRO made such an effort during early part of the last decade, but now that so much of the globe is “wired,” including the very poorest nations, the time is ripe to reconstitute this in collaboration with other international societies.

Nobel Peace Prize winner Muhammad Yunus has shown that the return on investment is greater when aid is divided into small parcels and given to motivated individuals with a personal stake in a project’s outcome (4). The concept of “microloans” may be used metaphorically to describe an emerging movement in radiation oncology. Many developed world institutions are now “adopting” institutions in an LMIC. In the Journal, we see descriptions of the University of California San Diego linking with a center in Senegal and the Massachusetts General Hospital with another in Botswana (5, 6). Each “parent” institution shuttles staff and equipment to the adoptee, develops deep human relationships, trains caregivers in basic but highly effective treatments such as high-dose-rate brachytherapy, and uses the Internet to consult and run tumor boards when they do not have “boots on the ground.” If the adopted institution offers most of the cancer care in that nation, as is the case for Botswana, then a huge impact can be made on national health. If every major institution, academic and nonacademic, in the US developed such a program, meaningful changes could be made simply at a voluntary level. It is not only fully trained health care professionals who wish to assist; medical students and residents are clamoring for opportunities in the developing world, and seizing them when offered (7, 8). They may deliver little in themselves, but they return as the standard bearers of our collective conscience, and, in time, when they become faculty, they will be the initiators of future projects.

Those who have volunteered in the Peace Corps know fully well the power of inexpensive, low-technology strategies to make a difference. Building basic hygienic water sources, a Peace Corps staple, changes behaviors and reduces the burdens of disease and death. Page et al examine closely the merits of cobalt teletherapy, essential and simple but extraordinarily effective (9). They match it against the linear accelerator, emphasizing its cost, planning, and low-maintenance advantages; but, at the same time, they do not underestimate the associated security and safety risks. The vendors are aware of the needs, and thus the extraordinary market opportunity, of the developing world; but their enthusiasm to sell high-end machinery will help only if it is matched by a level of support and service that is not currently present. Ideally, we would see the development of inexpensive, low-maintenance alternatives as a commercial strategy. Henry Ford did not make his money...
from top-of-the-line cars; it was the Model T, sold at little margin but in large numbers, that built his empire.

As Datta et al say, “there is no single blueprint” to resolve the huge mismatch between the urgent need for radiation therapy and its meager supply. It will take governments and supranational bodies, professional societies, individual hospitals, and individual volunteers; but the Red Journal, which bears the word “international” in its title, cannot exclusively address science and be above the discussion. This edition of the Red Journal displays the work of a number of thinkers and actors in this field, and will serve to ignite a discussion about strategies to help at many levels, to showcase some practical and ingenious solutions, to prick the conscience of those who have not given these issues much thought, and to inspire our entire community.

References


