

GlobalRad is a 501(c)(3) non-profit foundation (public charity) dedicated to saving lives throughout the world by means of a network for sharing medical images and information. The network will involve highly trained specialists, distinguished radiology institutions, an archive of teaching file cases, and a repository for clinical research cases—all facilitated by state-of-the-art computer hardware and software. The techniques used will include educational outreach, mentoring programs, and collaborative research efforts. Once established, the network will enhance the level of medical service in regions of the world not meeting the standards found in the large teaching universities in the United States. GlobalRad will not only reach out to places such as Eastern Europe, Africa, India, Southeast Asia, and South America, but will also link into rural areas in the United States and Canada.

Medical imaging with the advanced techniques of MRI imaging, CAT scanning, and other procedures has expanded at an astonishing pace in the last 20 years. It has become so core and so key to the diagnosis and management of patients that virtually all hospitalized patients receive some sort of imaging procedure during their stay. These powerful tools aid physicians in excluding or confirming pathology and in monitoring the treatment of many different disease processes. Without them physicians are essentially blind, seeing only the outside of the human body.

In many cases, judicious application of imaging procedures can avoid unnecessary surgery through non-invasive diagnosis. As an example, medical imaging has essentially eliminated exploratory laparotomy. However, the imaging test is only as good as the eye that reads it. It is a tedious and laborious process to become trained. Book learning alone will not do it. It requires the actual experience of seeing thousands of cases in different manifestations. There is no substitute for experience.

Limited Access to Imaging Expertise

P. A. Leggat writes: "Medical imaging is an essential component of clinical investigation. . . . Half the world's population cannot presently access the benefit of diagnostic imaging. . . . Some rural hospitals that have diagnostic imaging equipment have few or no health workers who are adequately trained to operate it . . ." ⁽¹⁾

Another author notes, "IN INDUSTRIALIZED COUNTRIES . . . THERE IS ONE DIAGNOSTIC RADIOLOGIST PER 10-30,000 PEOPLE. . . . IN THE LEAST DEVELOPED COUNTRIES THE CONDITIONS FOR RADIOLOGIC SERVICES ARE APPALLING: . . . ONE DIAGNOSTIC RADIOLOGIST FOR 100,000 TO 2 MILLION.

". . . The availability ratio of radiologic services in these least developed countries is about 100-fold less than that of the industrialized world. This enormous gap of radiologic services is increasing today, not only in terms of the ratio between machines and personnel per population, but also in terms of the quality of services offered, the efficacy of such services, and the modernization of equipment and updating of training. More than three-quarters of the world population is presently covered by radiologic services at an

unsatisfactory level. Many developing countries have radio diagnostic services available but do not have fully qualified diagnostic radiologists . . ."(2)

Unfortunately, most developing countries and most smaller community hospitals in this country cannot support high level specialists in each of the many areas of medical imaging. Furthermore, the majority of the world does not have access to the expensive textbooks and medical journals necessary to keep them up to date. The average radiologist spends several thousand dollars each year on journals and textbooks. This is simply out of reach for places such as Eastern Europe, Africa, India, and Southeast Asia. Often physicians will come to the United States or Europe at great personal sacrifice and relatively great expense to receive only a few weeks of training. Not uncommonly, experts from the United States will travel to other countries and give seminars, lectures, etc. Unfortunately, the contact lasts for only a few hours. The professor goes home; the impact is minimal and often not lasting.

As P.E.S. Palmer noted, "Even where national statistics give a better impression, in many countries the majority of X-ray sets are within cities and the rural areas have very few. To compound the problem, there is a worldwide shortage of radiologists. Not even all the countries of Europe have sufficient and in the developing world there is a sad lack of the radiologists they need.

" . . . While on the subject of radiologists, the time has come for yet another change. Building on the cadre of radiologists already trained in the larger hospitals of the Western world, training of future radiologists must now be in their own countries, or at least in their own WHO regions."(3)

Another seasoned expert, J.H. Middlemiss, notes: "Almost 20 years ago in the preface to the book *Tropical Radiology*, I wrote: 'In many countries there are few radiologists; in some there are none.' Since then the situation has not changed greatly. There are still some countries without a radiologist, and many more with few of their own indigenous people trained as radiologists.

" . . . Not all young doctors coming from a non-industrialized country for training in radiology wish to return to their own country, and some, having returned, have become so attuned to the way of life in the Western world that they gravitate back."(4)

A solution to this problem is not sending candidates to western countries to receive training, but to improve the training in their native lands.

Another author notes, "Trained radiologists are necessary not only for radiologic interpretation, procedures, and consultations, but also to supervise radiologic services and to provide education. THERE IS A SHORTAGE IN DEVELOPING COUNTRIES OF TRAINING CENTERS GEARED TO PROVIDING SYSTEMATIC GUIDANCE, INSTRUCTION, AND EXPERIENCE FOR RADIOLOGISTS IN TRAINING."(5)

Another difficulty in having radiologists trained in developing countries are problems with "immigration laws, medical licensing and financial support for the trainee during the training."⁵

Even in countries with relatively strong regional centers for imaging, there are many situations in rural facilities or regions where there are too few radiologists. Furthermore, the few radiologists who are available do not have access to the kind of specialized expertise needed to read imaging studies. This is especially the case in the Third World, but also to some extent in the United States.

The Fifth International Symposium on the Impact of New Imaging Technology on Worldwide Healthcare, Research, and Teaching in August, 1992, suggested that "examinations could be performed by technologists in the field, and then the images could be interpreted via computer hook-up by radiology experts in large hospitals that may be far away from the patient."⁽⁶⁾

Disparities in Medical Training

Another critical disparity that exists is between educational institutions. Some training programs are magnets for the brightest professors and the most skilled researchers, and are heavily endowed with scholarship money, research money, and a plethora of unusual and educational cases. In an era of managed care with shifting and scarce medical resources, many universities struggle to find the volume of teaching material necessary to properly train residents. In today's healthcare environment there are strong incentives for managed care plans to keep unusual cases within their system, rather than to refer them to expensive university care outside their own healthcare system. While this may be a disservice to medical education, it is a reality. Some medical training programs in the Caribbean, Mexico, and the Philippines train physicians for the U.S. market. These doctors come with even less experience necessary to practice top-level medical care.

University radiology centers are spending more time working like private practice radiologists, with contract reading of managed care patients. It is a financial necessity for economic survival. However, the interesting case load is diluted and the opportunities for teaching are diminished. Most universities supplement training with teaching files which are collections of interesting or important cases that residents can independently study. However, these are expensive to maintain. Because they are only copies, the films are often of inferior quality. Films often "walk away" from the files. They are difficult to categorize and keep organized.

Lack of Adequate Clinical Research Cases

Another significant problem occurring in radiology today is the difficulty in performing quality clinical research. Many types of diseases are rare. By definition this makes it difficult to obtain large numbers of these cases. Papers published are often statistically meaningless. Case reports and small series are reported from which it is difficult to draw meaningful conclusions. Even some of the most fundamental tenets of medical care often

go unchallenged and without research because of the difficulty in obtaining the data. Quality clinical trials require large numbers of patients, usually with cooperation between multiple institutions. Currently, the only mechanism to share clinical material is laborious, requiring extensive technologist time to copy films, secretarial time, air-shipping expenses, and coordination between clinicians. In some cases research is hampered by cases being lost before one has a chance to retrospectively review them. It is tedious and logistically difficult to retrospectively acquire enough cases for good research.

Medical care and procedures can have widely discrepant rates of utilization. This is because the decision process upon which medical care is based is often flawed. Radiology is right at the center of many of those decisions. For example, the rates of spine surgery in the United States vary by as much as fifty-fold. This is not accounted for by a difference in the incidence of spinal disease. Rather, it is accounted for by the application of clinical and imaging tests that decide when and if someone should have surgery.

References:

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