

RAD-AID, AN ORGANIZATION BRINGING RADIOLOGY TO RESOURCE-LIMITED REGIONS OF THE WORLD

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university-based chapters and on-site projects in 21 countries⁶.

I. INTRODUCTION

Resource-limited regions around the world stand to benefit greatly from sustainable global health initiatives, inclusive of both ionizing and non-ionizing medical uses of radiation. Optimal infrastructure for medical imaging and radiotherapy is difficult to establish. The World Health Organization has estimated that radiology is inadequately available to more than half the world's population^{1,2}. Ultrasound and low-cost radiography may be more widely accessible, but imaging such as CT, MRI, and nuclear modalities remain inaccessible in many world regions³, though they represent crucial diagnostic and interventional tools in modern medicine⁴. Addressing burden of disease and striving towards the goal of universal healthcare - according to evidence-based guidelines, clinical knowledge benchmarks, and best practices - obligates both medical imaging and radiotherapy.

RAD-AID seeks to bring imaging modalities to resource-limited regions and to promote appropriate use of them, at a time when interest in global health radiology is increasing². RAD-AID, in addition to sharing radiological tools and technologies, also supports teaching initiatives on a range of topics - for example, optimal image acquisition, radiation protection, PACS, DICOM, and image interpretation⁵. This supports team building of staff and trainees, alike, as they ally with RAD-AID to deliver radiology-related aid to regions in need², and has inspired the expansion of RAD-AID chapters across 53 ACGME-accredited academic medical centers - with on-site projects in over 20 countries^{3,6}. Associated capacity building by the entire RAD-AID team (e.g. radiologists, medical physicists, radiologic technicians/radiographers, ultrasound technologists/sonographers, IT professionals, and/or more) as relevant to the particular project bolsters the building of sustainable practices which maximize the population's benefit from integration or improvement of radiology into the Member State's healthcare services^{1,5}.

RAD-AID was founded in 2008 by a few members of Johns Hopkins University, and has since burgeoned to over 6100 volunteers from around the world, including 53

Project Sites, 2017

Africa

Cape Verde

Ethiopia

Ghana

Kenya

Liberia

Malawi

Nigeria

South Africa

Tanzania

Uganda

Asia

Bhutan

China

India

Jordan

Kazakhstan

Laos

Nepal

Latin America and the Caribbean

Guatemala

Guyana

Haiti

Nicaragua

II. GLOBAL HEALTH

RAD-AID applies a stepwise approach to project planning: (1) economic development, (2) technological innovation, (3) clinical model implementation, (4) educational approaches, and (5) public health policies⁷. Working with local stakeholders - to ensure sustainability after implementation - requires assessment of items (1), (3), and (5)¹. Clinical applicability quantifies the program's direct benefit for the patient population, for which (2) and (3) are particularly useful. Moreover, transfer of skills in using the introduced technologies entails onsite assessments (4).

As part of the aforementioned multidisciplinary approach, RAD-AID developed and trademarked (2009) a

tool utilized before and during deployment of radiology improvement programs, the Radiology-Readiness Assessment (Figure 1)⁶. As part of the assessment, data are collected to evaluate pre-existing availability of community resources and to identify local and regional medical needs. Then, an optimally impactful, achievable plan is created, with measurable deliverables, to target radiology needs. Implementation often includes equipment installation and clinical workflow design. Training constitutes an essential step, considered an opportunity for reciprocal education, and is discussed further in the section entitled “Educational Support”. Finally, the overall project and program results are analyzed in efforts towards further improvements and innovations⁷.

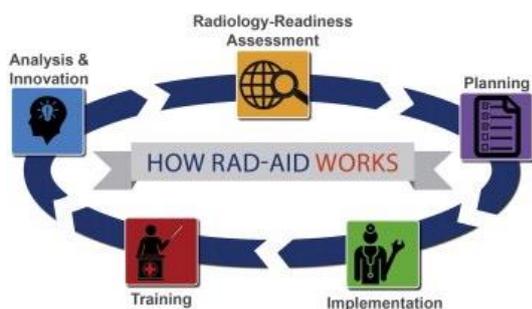


Figure 1. The steps of RAD-AID’s Radiology-Readiness Assessment allow for data-driven design and implementation of a program based on the medical needs of a community that are solvable with radiology.

One such successful project, a direct result of the RAD-AID Radiology Readiness Assessment, is a mobile women’s health care outreach program called Asha Jyoti (“Ray of Hope” in Hindi) in Chandigarh, India, which provides screening for breast cancer, cervical cancer, and osteoporosis in a decentralized, sustainable, and cost-effective manner⁸. This is a joint effort by RAD-AID, Philips Healthcare, and a local government medical center, the Post Graduate Institute of Medical Education and Research. Since the Asha Jyoti launch in 2012, more than 10,000 underserved women in northern India have been screened, thousands of whom live far from public hospitals and otherwise would receive no care⁸. Regular educational interventions on an annual or bi-annual basis by teams of residents and attending physicians through RAD-AID enable quality assurance of both image acquisition and interpretation.

III. EDUCATIONAL SUPPORT

RAD-AID’s Chapters Network has implemented a common curriculum for radiology residents that provides global health training and allows chapter members to work in inter-

institutional chapter teams. Academic training programs have incorporated international elective rotations supported by RAD-AID grants, technology, PACS support, project guidance, and educational materials³. To assist residents and students in adopting roles that are both helpful and not beyond their scope of training during their exposure to and assistance in promoting optimal global health^{5,9}, RAD-AID has committed to providing clear objectives for projects and training for the settings and contexts within which projects are implemented¹.

Examples of resident international elective programs include RAD-AID chapters at Emory University and New York-Presbyterian Weill Cornell Medical Center, with projects located in Ethiopia. Other resident project initiatives include employing online learning management systems in Nicaragua and Haiti, implementing PACS platforms (Ethiopia, Ghana, Nepal, Haiti, Nicaragua), performing demonstrations of procedures (Nicaragua, Guyana, Ethiopia, Haiti, Malawi), or reporting back on implementation of image-based screening (Bhutan, India)³.

As of this year, RAD-AID has extended its RAD-AID Certificate of Proficiency in Global Health Radiology to medical students, and has launched an elective course to be offered to medical students at the Columbia University College of Physicians & Surgeons beginning March 2017. The course is a four-week clerkship that incorporates didactic teaching from radiology faculty on global health, online modules pertaining to the Certificate of Proficiency, as well as a RAD-AID project overseas³.

IV. MEDICAL PHYSICS AT RAD-AID INTERNATIONAL

RAD-AID uses a multidisciplinary approach to address areas of need in diagnostic imaging. Medical physicists are an important part of the organization. One such example is the Lao Friends Hospital for Children where RAD-AID has partnered since the hospital opening in 2015. RAD-AID supports the department of radiology via education for the local imaging personnel and human capacity building. Medical physicists consulted extensively on the radiography room design and radiation safety procedures to ensure best practice. For its work in Laos, RAD-AID received the 2017 Healing Asia Award from Friends without a Border.

Physicists are providing team support and on-site acceptance testing for the RAD-AID CT educational programs in Guyana and Haiti. Medical physicists are joining teams of radiologists, technologists, and other healthcare professionals to provide education about quality management testing, radiation protection, and protocol

design as relates to CT imaging. From the beginning, medical physicists have been an essential part of this program creation and will join teams on the ground as part of implementation in 2017.

RAD-AID supports the goals of radiotherapy and education of radiation oncology professionals. In 2010, RAD-AID began the Cancer Imaging and Treatment Initiative in western China, which has since expanded to include programs in Kenya and Tanzania. In these initiatives, physicists play a vital role in providing education and in promoting the importance of the physicist role in the multidisciplinary team of radiotherapy.

Additionally, some RAD-AID partner locations, such as Tanzania, show an emergence of functional imaging techniques so all scopes of medical physics are critical for success in outreach initiatives. In stepwise approach supporting in-country human capacity building, the participation of medical physicists in RAD-AID International contributes to the mission of sustainable impact in radiology—including medical imaging and radiotherapy.

V. CONCLUSIONS

RAD-AID International is a growing non-profit organization dedicated to expanding access to radiology, and in some cases radiotherapy as well, in resource-limited regions of the world. By using its Radiology-Readiness Assessment, RAD-AID continues to generate programs around the world in communities where radiology can improve health. With an increasing level of interest from allied professionals, RAD-AID seeks to continue to foster relationships with the team of professionals required for medical imaging infrastructure, ministries of health, relevant facilities, and/or academic medical institutions in its partner nations and to provide education in global health to healthcare professionals. Like IOMP, RAD-AID

International is a non-state actor officially affiliated with the WHO, and RAD-AID both welcomes and needs input from the medical physics community as part of a team, multidisciplinary effort. The Radiology Readiness Assessment and subsequent planning of programs feature aspects for which medical physicists serve a vital role, including but not limited to radiation protection.

To learn more and get involved, please visit <https://www.rad-aid.org>

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