

Improving Pediatric Access to Ultrasound in a Tertiary Care Hospital in Malawi

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Introduction

- Malawi is a landlocked country in southeast Africa with one of the lowest GDP/capita in the world and one of the highest rates of HIV/AIDS in the world
- Mix of public and private healthcare
- A pediatric death audit at the public tertiary hospital Kamuzu Central Hospital in the country's largest city, Lilongwe, showed disparity in access of timely radiology studies, particularly ultrasound, for pediatric patients
- Many pediatric patients died before they were able to be evaluated with ultrasound, clouding the cause of death and underlying diagnoses these patients had
 - 14.6% of patients whose deaths were reviewed had delays of greater than 24 hours in obtaining radiology studies
- In addition to HIV/AIDS, high prevalence of other infectious diseases such as TB, schistosomiasis, malaria, yellow fever
- KCH is staffed with multiple radiographers who double as sonographers. Currently two attending radiologists, one of whom is permanent and one whom is a visiting professor
- Radiology equipment is currently one portable XR, one stationary XR, one stationary ultrasound machine with ECHO capabilities, and two portable ultrasound machines one of which has ECHO capabilities
- Partnership between RAD-AID, UNC RAD-AID Chapter, and KCH started in 2013 after a radiology readiness assessment was completed
- Partnership between RAD-AID and Malawi Children's Initiative began in 2019. The first volunteers traveled in August-December 2019 (of which I was included)

Goals/Objectives

- Improve access to ultrasound studies for pediatric patients
- Improve technical skills of local radiographers
- Improve sonography curriculum



Methods

- Identified a cohort of learners of which to provide longitudinal mentorship to adapt and manage the needs of the local healthcare environment
- Ensure sustainability of intervention by qualifying learners to have ability to train future technologists
- RAD-AID to send American-trained technologists and physicians to provide hands-on teaching and real-time feedback for local sonographers
- Learners and volunteers fill out assessment forms
- Each instructor was assigned to create multiple didactic lectures relevant to the local healthcare needs
- Group of ultrasound learners were enrolled in the RAD-AID Inteleos Global Health Ultrasound Proficiency Testing
 - Certificate-bearing education program for on-site and remote learners
 - Created in partnership with RAD-AID and POCUS Certification Academy
 - Three components: fundamental concepts, essential core content, and specialized practice
 - Achieved a minimum of **2000 hours of ultrasound scanning experience** in the relevant testing area
 - Proof of time via logbooks
 - KCH is the pilot site for this new, exciting ultrasound curriculum
 - Three Malawian learners have successfully passed the Fundamentals portion of the program
 - Hastings Banda, Fanuel Betchani, and Madalisto Liponjera

Cardiac		
PLAX	4	2019
PSAX	4	2019
Apical 2,3,,4,5 Chamber	3	2019
Subcostal	3	2019
Supra Sternal Notch	2	2015
PDA	3	2018
ASD	4	2019
VSD	5	2019
Ejection Fraction	4	2019
Pericardial effusion	5	2019

Cardiac		
PLAX	4	12/13/2019
PSAX	4	12/13/2019
Apical 2,3,,4,5 Chamber	4	12/13/2019
Subcostal	4	12/13/2019
Supra Sternal Notch	3	12/13/2019
PDA	3	12/13/2019
ASD	5	12/13/2019
VSD	5	12/13/2019
Ejection Fraction	4	12/13/2019
Pericardial effusion	5	12/13/2019

Volunteer	Lecture Date	Lecture
John Campbell, MD UNC Radiology Resident 8/26-9/20	9/2	Ultrasound physics/artifacts
	9/4	Peds Basic Anatomy (Abdominal survey)
	9/6	Lymph nodes: Normal, Reactive, Burkitt lymphoma, TB, Supraclavicular, axillary
	On-going In Country	Peds self-assessments – work with Hastings/Miriam on scan techniques
	On-going In Country	Peds self-assessments – work with Clinical Officers on POCUS techniques
Amit Sura, MD (RAD-AID) Pediatric Radiologist 9/11-9/22	On-going In Country	Radiology Readiness Tools
	On-going In Country	Peds self-assessments – work with Hastings/Miriam on scan techniques
	On-going In Country	Peds self-assessments – work with Clinical Officers on POCUS techniques

Jon Weber, MD (RAD-AID) Radiology Resident Pediatrics (Northwestern U.) 11/18-12/4	11/25	Schistosomiasis – Ultrasound findings
	11/27	Comparative Anatomy US vs. CT – clinical decision making – which test?
	11/29	POCUS techniques: Skull fracture Optical (FB, Detached retina)
	On-going In Country	Peds self-assessments – work with Hastings/Miriam on scan techniques
	On-going In Country	Peds self-assessments – work with Clinical Officers on POCUS techniques

Results/Conclusions

- Improvement in evaluation scores over the course of 4-5 months of hands-on teaching
- Validation of education goals by learners passing POCUS exams
- Sponsorship of Mr. Hastings Banda to receive master's level education in sonography in Uganda. Formal sonography education is not available in Malawi



Future Directions

- Immediate future plans torpedoed by COVID-19 pandemic
- RADAID, MCI to continue to send volunteers to KCH from physician, resident, and radiology technician sides
- Continued virtual lectures on various topics related to local needs - infectious disease, pediatrics
- Continued participation on WhatsApp thread sharing cases and taking on difficult cases with group input

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