



Assessment and training trip, Malawi July 2014

This trip was set up by the WFPI as an initial exploratory outreach mission to teach and determine pediatric radiology needs in a number of different environments in Malawi. The mission was undertaken with a view to providing tele-reading support for pediatric imaging and pave the way for future teaching and training visits.

A member of the South African Pediatric Imaging Society and a WFPI tele-reader volunteer, **Dr. Tracy Kilborn** (Red Cross War Memorial Children's Hospital Cape Town, South Africa) volunteered for the trip. Her geographical proximity and experience with endemic diseases, equipment constraints and environmental limitations leave her well equipped for regional outreach.



Dr. Tracy Kilborn with Dr. Peter Maseko, Pothawira Haven, Salima, Malawi, July 2014

Day 1: 28/07/14 Blantyre – Queen Elizabeth Hospital

Hospital details - Radiology Department:

- 1 MoH Radiologist (Dr. Arthur Daire), 1 private radiologist who covers 2 MRI lists per week to assist with cover, 18 radiographers (3 self-trained in Ultrasound, studies checked by radiologist only in the event of difficulties).
- 50 – 100 paediatric studies done per day.
- No computers or network, records of procedures & reports handwritten, plain films printed. Films often sent home with patients.

Equipment:

- 1x CR – needs the print option to work in order to function, can store to USB.
- 2 other plain radiography units, processed in dark room, need running water - not always on hand.
- 4 mobile units, non-functioning.
- 1 x GE ultrasound with USB port, linear probe, 3MHz curvilinear and cardiac probes – needs a paediatric probe.
- 0.75T open magnet – installed by Johns Hopkins as a research magnet, used by the hospital. Has a direct link to Johns Hopkins for review of images and is supported by an MR radiographer from the USA who visits twice a year to do training. MR images of hospital patients are drop-boxed to the relevant clinicians through the network in MRI to personal email accounts.
- No CT (64 slice Philips scanner was purchased 4 years ago but remains in storage pending the building of a room), fluoroscopy, nuclear medicine or access to radiotherapy.



Dr. Arthur Daire (left), the Records Room (right)

Hospital details- Paediatric Services

- 300 Paediatric beds, 100,000 Paediatric reviews per year in A/E, 20,000 Paediatric Admissions per year.
- 10 Paediatricians and 4 paediatric surgeons. Mainly general paediatrics, have subspecialists in neurology, cardiology, neonatal and oncology.
- 11 Paediatric Residents (6 Malawian and 5 visiting). Malawian paediatric residency is 4 years (3 years in Malawi and 1 year outside Malawi, usually South Africa). Subspeciality training in South Africa – 2 years.
- Challenges include 4 ICU beds for the whole hospital including paedes, no ventilators for neonates or surfactant, difficulty accessing radiology services.



University and College details:

- University of Malawi College of Medicine is based in Blantyre and has a Department of Paediatrics.
- Most of the staff paediatricians are employed via the university and the College of Medicine (not MoH), also several international staff employed via NGOs.
- The College (which is adjacent to the hospital) has a robust network with wireless and IT support.
- Has curriculum management system for postgraduate training that is password protected and multiple E-learning resources in PDF format on their website. Radiology content needs boosting.



Physician team, Queen Elizabeth Hospital

WFPI activities during the visit:

Lectures to the paediatric and paediatric surgical staff on:

- ⇒ Approach to a paediatric CXR.
- ⇒ Approach to a paediatric AXR.
- ⇒ Imaging of neonatal GI emergencies.
- ⇒ Imaging of non-accidental injuries.
- ⇒ Basic approach to nuclear medicine in renal disorders.

Consulted on some complex medical and surgical cases, taught paediatric ultrasound techniques to the sonographers, engaged in discussion of CXR technique with radiographers.

All lectures and other personal teaching files and lectures feed onto their e-learning (College of Malawi website) and postgraduate training platforms.



What WFPI could offer in the future:

- Teleradiology support for problem cases – best set up through the college network, personal email contact as a temporary measure.
- Point of Care Ultrasound – one doctor has his own portable machine that he uses to do cardiac scans and some chests. **It is clear that being able to do their own scans for line placements, chests, abdomens and heads would make a huge difference to both the medical and surgical services.**
- Webinars could be set up via the college for remote learning, as could skype conference calls if multidisciplinary meetings are planned, aiming to provide support to non-radiologist physicians.
- When the CT is set up, telereading support may be the only solution until another radiologist is employed.

Day 2: 29/07/14 Chiradzulu – MSF Regional Office

Background:

MSF runs an HIV/AIDS program in Chiradzulu, a rural district of south eastern Malawi, (45 minutes drive from Blantyre). ARVs were provided to the first patients in 2001. Since then over 39,000 patients including over 3,400 children have been initiated on ARVs. MSF run 10 health care centres in the region and assist in 1 clinic within the district Chiradzulu Hospital – activities now include HIV testing and counselling, ARV provision (including preventing mother to child transmission in pregnant women), voluntary male circumcision, and management of TB. MSF aim to hand the service over to the Malawi Department of Health in 4 years’ time. The main office team turns over regularly.



Chiradzulu District Hospital

The project structure and management was examined to see whether the WFPI could assist in the paediatric plain film reading and whether there was any additional outreach that could be offered.

Management of patients needing imaging:

- The health centres and the hospital clinic are run by health care assistants (called Clinical Officers/ TB Officers), not medical doctors.
- If a patient is suspected of having TB or other infection they are referred to the Chiradzulu District Hospital for imaging.
- The CXRs are interpreted by the TB Officer at the hospital, if the film needs an additional opinion it is referred to the Hospital Doctor and MSF TB manager . No radiologists are involved in the interpretation.
- TB Officers report that they see approximately 2 paediatric TB cases per month. MSF teleradiology platform

not used as so few cases referred for review.



Radiology Services at Chiradzulu District Hospital

- Plain radiography and Ultrasound are offered at the hospital by 3 radiographers.
- Film is printed via a daylight processor (has not been working for 2 months requiring the chief radiographer to drive a 90 minute return trip to Blantyre daily to process films).
- The paediatric films are done supine and they use appropriate exposure factors.
- Do not perform lateral projections.
- Do 3 - 4 paediatric CXRs a day.
- Ultrasound is performed by one of the 3 radiographers – self taught, issues with interpretation of paediatric ultrasound.
- There is no internet connectivity and all records are hand written.

WFPI activities during the visit:

- Discussed the potential for remote paediatric CXR reading via the MSF platform with the Hospital Manager, the TB officers and the MSF staff.
- Gave a short review on how to interpret paediatric CXR followed by the self-assessment TB lecture prepared by Savvas Andronikou.
- Despite incomplete attendance, the teaching was thoroughly enjoyed by the clinic nurses, the chief radiographer from the hospital, the MSF medical coordinator and epidemiologist.



Scope for further WFPI involvement:

- It seems clear that TB in children is being underdiagnosed in the region. With the number of adult cases diagnosed it is incongruous that there are so few children affected. Also, the statistics for TB in children at Blantyre Hospital suggests that this must be the case.
- Program turnover and full participation issues could prove challenging for future assistance.
- If further on-site outreach is planned for Blantyre, Chiradzulu radiographers would benefit from ultrasound training.

Day 3: 30/07/14 Lilongwe – Kamuzu Central Hospital

Hospital Details – Radiology Department

- 1 Radiologist, full-time. 1 Radiology Trainee, not in an official training position but has an interest in
- Radiology. 16 Radiographers (3 do Ultrasound, 1 of whom has formal Ultrasound training from South Africa).
- 50 – 100 paediatric studies done per day.
- Have access to internet within the department, 100mbs line that fluctuates, computer available.
- Records of procedures are handwritten, as are reports.

Equipment:

- 1x CR – used for research.
- 1 plain radiography units – with daylight processor Bucky broken so only do supine examinations.

- 3 mobile unit.
- 1 x ultrasound with USB port, linear probe, 3MHz curvilinear and cardiac probes – no paediatric probe
- 64 slice Philips CT (unable to do bolus tracking due to cost of syringes).
- No fluoroscopy, nuclear medicine or access to radiotherapy.
- The department does receive some outreach support from Bergen University, they have provided refurbished equipment. They also assist in radiography training and occasionally send radiologists on outreach visits.

Hospital details- Paediatric Services

- 230 Paediatric beds, 20,000 Paediatric Admissions per year.
- 10 Paediatricians (1 MoH), no dedicated paediatric surgeons, surgery performed by general surgeons. Patients are referred to Blantyre if expertise required.
- 4 additional paediatric consultants employed via the College and NGOs.
- 5 junior doctors (not residents) are rotating through paediatrics.
- The paediatricians are supported by health care assistants (medical officers).
- Challenges are similar to Blantyre – 4 ICU beds for the whole hospital including paed, no ventilators for neonates or surfactant, difficulty accessing radiology services.
- The hospital supports research projects run by Baylor College of Medicine and the University of North Carolina, they have their own clinicians and researchers and are not involved in support to general paediatrics.



WFPI activities during the visit:

Lectures to the paediatric and radiology staff on:

- ⇒ Approach to a paediatric CXR.
- ⇒ Approach to a paediatric AXR.
- ⇒ Consulted on complex body and neuro CT cases.

Discussed paediatric CT technique including stopping precontrast and triple phase imaging and adjusting paediatric dose. Followed this up by providing protocols and dose charts from Red Cross Children's War Memorial Hospital (has the same scanner).

Taught paediatric ultrasound techniques to the sonographers.



Lectures in Kamuzu Central Hospital

What WFPI could offer in the future:

- Teleradiology support for problem cases – best set up through the college network.
- Point of Care Ultrasound: have a small portable machine, but only used for pleural effusions. After-hours US

difficult to obtain unless one of the sonographers is on duty. **Teaching basic point of care scans would be invaluable to these clinicians.**

- Webinars as for Blantyre.

Days 4/5: 30/07/14/ & 01/08/14 Salima – Pothawira Haven

Background



Salima is a village lying close to Lake Malawi, 90 minutes away from Lilongwe. Pothawira Haven was started by Dr. Peter Maseko and his wife Emma 3 years ago. The entire project has been funded and continues to be so through donations. Electricity is supplied by a generator that runs a few hours a day (fuel is prohibitively expensive) and the facility relies on water from a borehole. Dr. Maseko, together with 4 nurses and an occasional volunteering medical student, runs a clinic that sees 200-300 patients a day. Patients that can afford to pay a nominal amount. Pothawira also supports 110 orphans all of whom live at and are schooled at the Haven.

WFPI delivered a portable battery powered Ultrasound machine donated by Dr. Kristin Destiger of Imaging the World. Pothawira Haven's existing machine placed a huge load on the generator limiting their ability to use it. Over the 2 days spent at Pothawira, Dr. Maseko was trained on the machine's use and how to image children (previous scanning limited to placental position in antepartum haemorrhage and to look at foetal viability).



Dr. Peter Maseko receiving US training on the new machine



The very excited orphans volunteered as our teaching material and after 2 days Dr. Maseko was competent to scan heads, chests, abdomens and looking for pericardial effusions.

The radiology trainee from Lilongwe Dr Pamela Gunda (below) came along to Salima to learn paediatric US techniques.



There is definitely scope for a follow-up visit to assist Dr. Maseko further. In the meantime he has been offered email backup as the machine has a USB port and can store images and cine loops. With minimal staff and donations, Pothawira Haven does great work and have such vision for what it wants to provide – it was a profoundly humbling experience to be there.





Pothawira Haven, Dr. Peter Maseko

Overall Feedback

Given the limits to radiology services in the facilities visited, the reduced number of radiologists cannot provide support for radiography and ultrasound. The majority of their reporting time is spent in CT (Lilongwe) and MRI (Blantyre).

The paediatricians in both centres and paediatric surgeons in Blantyre would benefit from teleradiology support for their imaging – although they did express concerns about turnaround times, and remarked that previous reports have not always been specific enough, i.e. a description of findings without a definitive diagnosis, particularly in the cases where they are querying TB.

Point of care ultrasound in all the centres visited would be of immense relevance and value. This would seem an obvious focus point for WFPI during any further visits.

Thank you to the WFPI for facilitating this outreach visit to Malawi, I loved every minute of it and really felt like we made a difference. Thank you also to all my hosts at Queen Elizabeth Hospital, Chiradzulu District Hospital/MSF, Zamuzu Central Hospital and Pothawira Haven, Salima.

Tracy Kilborn August 2014.