Countess of Chester Radiology Department Visit to Kisiizi Hospital

April 2011

Report

Contents

1. Introduction

The fourth visit to Kisiizi Hospital by the Countess of Chester's Radiology department started on the 29th of April.

The visit was for two weeks, the team members included;

Leanne Mapletoft-Zygmant (Senior Radiographer)

Dr Gian Abbott (Consultant Radiologist)

Mark Smallwood (Reporting Radiographer)

As with previous visits, the team members were an experienced group with a wide range of skills and experience that could be drawn upon.

This was the third visit for Mark Smallwood and the second for Dr Abbott, this ensured continuity for the project.

2. Aims

The aims of this visit were to continue providing tutorials to the Radiology department, Clinicians and wider hospital staff on a variety of topics, to maintain/install equipment and to continue observing to see if any further help could be provided.

3. X-Ray Imaging (L. Mapletoft- Zygmont/M. Smallwood)

3.1 Project Work Undertake

The main aims for this project included

- Building on the previous progress with regards to Radiographer training.
- Continue training for clinicians and Radiographers with regards to image interpretation.
- Install and maintain equipment.

3.1.1. Changes to the structure of the X-ray department so far.

There has been considerable improvement in the building structure since the scoping visit in 2008. There is an extension for the ultrasound department which has two rooms and there is a toilet facility. The dark room has reduced in size but is now fit for purpose with an automatic film processor. A new tile floor has been fitted throughout for ease of cleaning. There is also a new ramp up to the x-ray department which has improved access for wheelchair and stretcher patients

3.1.2. Education program

Four tutorials were delivered to the Radiography staff regarding basic anatomy and technique. The areas covered were cervical spine, thoracic spine, lumbar spine and sacrum and coccyx. These topics were agreed in advance by the Kisiizi team.

The tutorials were delivered using the aid of power point presentations and practical sessions. Also small discussions were carried out throughout the visit about positioning technique and film analysis.
These tutorials were received well by the Radiographers at Kisiizi and they were keen to ask questions.

On previous visits, concern has been raised regarding radiation risks. Therefore a presentation was given to the Radiographers covering risks, physics, history and safety. To highlight radiation behaviour, a dosimeter was brought from the Countess of Chester to illustrate the theory.

A similar but more applicable presentation was given to the Student nurses in the Chapel. This was thought to be useful as this group always appeared overly cautious of holding patients in the Radiology Department during exposures. The questions that followed from the students were intelligent, numerous and thought provoking.

Rejected films from the previous six months were collected and data drawn from them. (Appendix1.) Discussions included reasons for rejection and when images were acceptable.

A small amount of Barium studies were performed during the visit. These were successful and provided very useful diagnostic information.

An IVU was performed successfully with good image quality. Discussions were made with the visiting Pharmacy team about a dedicated emergency drugs box in Radiology in case of reactions.

Previous lectures on radiation protection are being heeded as all rules were followed correctly. Patients were accurately questioned regarding pregnancy status and also a carer that was going to steady the patient during exposure was spotted to be pregnant and replaced.

3.1.3. Image Interpretation

Multiple lectures were provided to medical staff which enjoyed good attendance.

Topics covered included

- Liver abcesses
- Chest X-ray interpretation (as requested on previous visit)
- Normal variants
- Skull X-ray interpretation (as requested on previous visit)
- Cervical spine interpretation review (as requested on previous visit)

- Interesting MSK cases

Due to the limited time available for teaching compared to previous visits and a public holiday, the latter three lectures were combined into a long session.

Testing of the previously described teleradiology system occurred. The images received in the UK were suboptimal. This is suspected to be due to compression during transmission. Further work is needed however contacts were made to help this system when a solution is found. A quick refresher on optimum camera use for this purpose was given to Brenda.

3.1.4. Equipment

The major piece of equipment for installation was a silver recovery unit. Problems were encountered during its installation with fixings and flow but it is now operational. The unit was thought to be a useful item as it would extend the life of the fixer thereby saving money and the recovered silver could be sold producing revenue.

The chest stand is now very difficult and slow to use. Difficulties have occurred trying to source an appropriate unit. Efforts must continue here as a priority.

Textbooks were provided on Physics, anatomy etc.

Wet weather clothing and footwear was provided for moving around the hospital in bad weather.

Storage units and notice boards were assembled and put to use.

A plug in the darkroom was repaired as this was required for the silver recovery unit. A plug was also installed in the staff room to power one of the viewing boxes that was brought with the team. This was thought to be a useful site as staff discuss cases during break times therefore it would be useful for viewing radiographs..
The other viewing box was left in the brand new theatre block ready for installation.
Assistance from the Electricians was very prompt during the visit.

Sand bags to assist with positioning were given, these proved useful during the visit.

The previous step that was used to assist patients onto the x-ray table was very high and unstable. A new safer low metal unit was provided.

The processor is working well however a more vigorous cleaning method has been suggested as staining is occurring in the tanks and rollers.

New exposure charts were generated for the new cassettes and film. There are limited supplies of the old film left now. When depleted, the department should be more streamlined and less confusing for staff.

Enquiries were made regarding installation of a computed radiography system. The equipment can be obtained from the UK. The proposed new hospital wireless system is adequate for purpose and it seems an engineer from Kampala could service the

units. Further investigations here are required to assess further problems with this idea. It appears that Kisiizi would be the only hospital in Uganda to have this technology. Advantages would include zero outlay for film and chemicals, faster imaging and less repeat radiographs.

3.2. Recommendations

Recommendations for COCH staff
1. Technique lectures to be provided for skull, abdomen and OPTG's.
2. Further lectures on manual handling, basic life support, contrast agents and anatomy.
3. Further assessment for CR viability.
4. Continue reject analysis.
5. Check silver recovery.
6. Review emergency drugs box.
7. Discuss with nursing staff procedures for patient escort to Radiology.

Recommendations for Kisiizi Staff
1. Order OPTG film
2. Continue to collect rejected films for reject analysis
3. Continue to check the processor chemicals to see when they need changing as now have silver recovery process thus may not need changing as often, Kisiizi staff advised to email Mark Smallwood if there are any questions or problems regarding this.
4. Continue to update the green film exposure chart as necessary.

Suggested Equipment List for Next Visit
1. Chest stand (priority)
2. Spare darkroom bulbs
3. Spare parts for current processor/New processor (space and weight permitting)
4. 24.X30 Grid
5. Face masks
6. Small chair for paediatric chest radiography
7. Paediatric exposure charts
8. Pillow cases
9. Larger sheets that encase the mattress to assist patient positioning

4. Ultrasound Project (Dr. G. Abbott)

4.1. Project Work Undertaken

The main work to be done this visit was to check that all the ultrasound equipment was in working order and provide continued teaching and support to Brenda.

4.1.1. Staffing

Brenda Kamwesigye is still working single handed in the ultrasound department thus when she is on leave there is no ultrasound service. A second ultrasonographer ,

Proscovia, who is also trained as a midwife will have completed her training in august 2011 and will join Brenda in providing the ultrasound service.

Brenda is a very skilled ultrasonographer who has been very well trained. She is able to put the imaging findings in to clinical context and provides a very good opinion on her findings.
She enjoys the work because of the variety and rage of pathologies but needs support for what is a very demanding job which will hopefully come from Proscovia

4.1.2. Equipment

The ultrasound department has three machines. An old Aloka machine with two probes which does work but the image quality is suboptimal. A new thermal printer intended to be used with this machine could not be installed as the coaxial lead was not compatible. This will be rectified on the next visit and will not have an impact on the department as the machine is not currently used for clinical work.

The GE logic 9 donated by COCH is used for clinical work and is of very high quality. The 3.5MHz probe cable was damaged. This has been temporarily repaired and efforts will be made to replace it in due course.

The GE notebook which is a portable machine with two probes was used twice in the first week. The first patient was a neonate with a possible intussusception and the second was a female in status epileptcus where foetal viability needed to be urgently assessed
This is a very useful machine which produces high quality images on patients who are unable to leave the wards due to being too unwell.
We had planned to take the machine to an outreach clinic in the community but unfortunately the power supply of the machine failed and we were no longer able to use it.
Brenda has been asked to source an engineer to fix this piece of equipment. We have given her a name and contact details for a GE engineer in England who may be able to help her find an engineer in Kampala.

4.1.3. Education

Dr Abbott worked closely with Brenda during the visit which she found very useful. He gave Brenda some tutorials and taught her about abdominal and pelvic scanning as well as helping her with more complex scanning techniques.

4.1.4. Service Improvement

Medical staff could be trained to use the portable ultrasound machine when fully functional for use on the wards for general medical conditions and obstetric problems. This would be useful for emergencies, particularly if the ultrasonographers are unavailable for example during annual leave or study time.

There would be some value in developing the use of the transvaginal probe for pelvic scanning for general pelvic pathology and early pregnancy assessment and detection of ectopic pregnancies.

4.5. Recommendations

Overall this busy service is running very well but is very dependant on the skill and availability of the single ultrasonographer, Brenda. Back up with a second ultrasonographer, Proscovia will help. Greater use of the portable machine both within the hospital and for outreach clinics is recommended.

Suggested Equipment List for Next Visit

1. 3.5 MHz probe
2. Water filter
3. Cable for thermal printer

5. Summary

The radiology department has improved significantly since the link with COCH was established in 2008. It plays an important role in diagnosis and assessment of the patients.

The radiographers at Kisiizi have shown a huge improvement in the quality of radiographs they are producing which is demonstrated by the results of the reject analysis. (Appendix1.) Also their understanding and implementation of radiation protection and patient safety has greatly improved. Reverend Ezra and Benon are continually improving their knowledge and skill base and are both very keen to learn and progress.

The Radiology department at Kisiizi is renowned for its cleanliness and tidiness. This is down to the hard work and commitment from Annette. Cleanliness is a very important factor in maintaining image quality in an x-ray department as well as reducing risk of infections.

Previous ultrasound staffing issues have now been resolved, with the appointment of Brenda last August and the commitment to train Proscovia. Brenda has been a huge asset to the department over the last 6 months and Proscovia will join Kisiizi full time in August.

The current team work very well together and staff retention is now very important in order for Kisiizi Hospital to continue providing the high quality Radiology Service that it has been achieved.

Access to a remote reporting service would be of major benefit to the clinicians. Distance learning for image interpretation would also be very useful and may be achievable via programmes such as e learning for health.

Our visit in April 2011 was deemed very successful and enjoyed by all the staff that went. As usual the staff at Kisiizi were very welcoming, kind hearted and a joy to

work with. It is only though their willingness to learn and adapt to new techniques that this project is as successful as it has been. We feel that this visit was very beneficial for both ourselves at COCH and the staff at Kisiizi and are looking forward to the next visit in October 2011.

We would like to take this opportunity to thank everyone from Kisiizi and COCH who have supported this project throughout and helped to make it so successful.

Appendix 1

Kisiizi Hospital, Uganda
Film Reject Analysis Re-Audit
Period 2 October 2010 to April 2011

Aim

To Audit and compare the film rejects from Period 2 with Period 1 to see if there have been any significant changes, since actions were put in place following the last Audit

Method

As before the reject films were collected from October 2010 to April 2011. The films were counted, analysed and put into the same 7 categories chosen for the last Audit. The information was recorded on the data sheets. We also counted the number of films used in the same period. This information was taken from the daily records book in the department.

Results

Period : 1	From: April 2010	To: October 2010

Cause	**Total**
Technique	21
Patient Movement	4
Under Exposure	21
Over Exposure	9
Darkroom Faults (Fogging, Artefacts etc)	13
Processor Problems	3
Other	0
Total	71

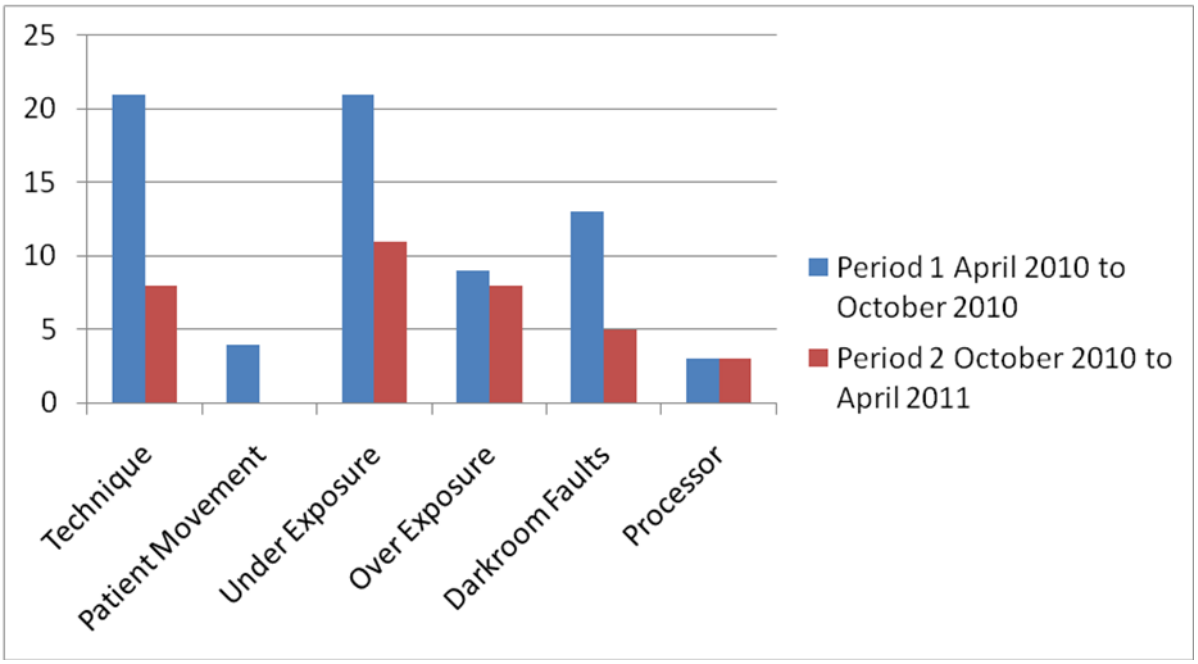
Total films rejected 71
Total films used 1023
Rejected films as a percentage of films used 6.94%
Cost of films rejected this period 106,500 Ugandan Shillings
(Using 1,500 average cost per film)

Period : 2	From: October 2010	To: April 2011

Cause	**Total**
Technique	8
Patient Movement	0
Under Exposure	11
Over Exposure	8
Darkroom Faults (Fogging, Artefacts etc)	5
Processor Problems	3
Other	5
Total	40

Total films rejected 40
Total films used 1507
Rejected films as a percentage of films used 2.65%
Cost of films rejected this period 60,000 Ugandan Shillings
(Using 1,500 average cost per film)

Reject Film Analysis Audit



- A total of 40 films were rejected in period 2 compared to 71 previously
- Overall cost of rejected films has reduced by 44,500 Ugandan Shillings
- The number of rejects has reduced in all the categories' except processor which has stayed the same
- Only 2.65% of films used were rejected in period 2 compared to 6.94% in period 1
- Rejects due to technique errors have reduced by 61.91%
- Rejects due to under exposure have reduced by 47.61%
- Darkroom faults have reduced by 61.54%
- Over exposure and processor rejects remain much the same
- Patient movement rejects have reduced by 100% to zero

Conclusions

The number of reject films has reduced significantly since the last audit. All categories have reduced with the exception of processor problems which remains the same. This is a very positive indicator that there has been significant improvements in image quality.
Assessment of image quality is used as a measurement of competency and so indicates that the education program being delivered is making good progress.
The significant reduction in under exposed films is an indicator that the action of changing the chemicals more often as recommended as a result of the last audit has worked and should be continued.

Actions

Rejects will continue to be collected and re audited in 6 months

Practicing patient positioning

Teaching technique

Adapting technique

New light boxes

Setting up the silver recovery unit

Mixing chemicals safely

Radiation protection lecture

Silver recovery

Radiation protection tutorial

The team

New waterproofs

The darkroom