Welcome to King’s Radiation Protection Service’s first newsletter. We aim to share information with you from the world of Radiation Protection every quarter.

There will be several regular features such as feedback from inspections, QC examples, DRLs, equipment and FAQ sections. There will also be interviews with some of the people we work with. Plus we will list courses, publications and conferences.

We hope you find this newsletter useful. We’d also appreciate your suggestions and input for future issues of Radiating News.

Happy reading!

New Courses for 2013

Radiation Protection Training for Nuclear Medicine Technologists
Community Dental Nurse Training
Radiation Safety for Radiology Nurses

Ask us questions about Radiation Protection:

Please contact us at:
King’s Radiation Protection Service
Tel: 020 3299 3537
kch-tr.radiationprotection@nhs.net
From the RPA’s desk

One thing that guarantees high stress levels is the prospect of an inspection by one of the external agencies. Since I became an RPA, these have averaged about six a year. Touch wood, there have been no enforcement or improvement notices and this reflects the hard work and vigilance of all the staff involved.

Over several issues of our newsletter, I will be looking at the approach taken by the different agencies and the key points that I think are important. I’m going to start with the Care Quality Commission (CQC) and IR(ME)R – my favourite topic!

The CQC inspectors will continue to carry out programmes of proactive inspections (announced and unannounced) across the UK in 2013. Any organisations that have never notified the CQC of an IR(ME)R incident resulting in a patient exposure that was ‘much greater than intended’ are most likely to be inspected.

Equally, a notification may prompt a reactive inspection depending on the seriousness of the incident or whether there are recurrent failings.

Some questions to be asked:

1. Do the employer’s IR(ME)R procedures accurately reflect what goes on in the organisation and are staff conversant with them?

2. Are the procedures controlled, reviewed and signed off by the appropriate committee or the chief executive?

3. Do you know who is entitled to refer patients for medical exposures both from inside and outside the organisation?

4. Do you have lists of individuals entitled to act as practitioner and/or operator across all radiology modalities together with training records?

5. Are practitioners and operators aware of the doses patients receive from particular examinations?

6. Are you satisfied that your department optimises patient exposures?

7. Do you have written clinical protocols in place for all examinations and treatments?

If you can answer yes to all, then you can relax. If you can’t then there are some issues to be resolved.

If failings are identified during an inspection, the CQC may serve an improvement notice. Here are two examples that resulted from reactive inspections:

- Inadequate employer’s procedures and no protocol in place for treatment of thyroid cancer. ARSAC licence had also expired at the time of the treatment.

- Radiologist carrying out interventional CT was not adequately trained and operators had failed to ensure that patient exposures had been optimised.

For more information on CQC reports, go to:
http://www.cqc.org.uk/organisations-we-regulate/special-reviews-and-inspection-programmes/ionising-radiation/key-findings
Digital breast tomosynthesis (DBT) – the latest mammo craze

The digital age brings many opportunities for development and all sorts of clever tricks. The latest wizardry is digital breast tomosynthesis or DBT – a 3D imaging technique involving the acquisition of images in an arc about a stationary compressed breast which are then reconstructed allowing the breast to be viewed in a series of slices or sequentially in a dynamic video mode.

We are fortunate at King’s to be one of the first in the UK to have two machines capable of DBT. Our Breast Screening Unit has made significant contributions to its evaluation and its clinical use in screening and assessment settings. King’s is currently involved in the TOMMY trial – a comparison of TOMosynthesis with digital MammographY in the UK NHS Breast Screening Programme.

**Image acquisition:** The figure above describes the basic principles of tomosynthesis. The breast is compressed and a series of exposures is made over a limited angular range and acquired by a digital detector. The first, central and last exposures are shown (images A, B, C). The central, standard mammographic view, shows how the tissues overlap in acquisition B.

**Image reconstruction:** Reconstruction of each plane is achieved by shifting the images and adding them together, so that features at a certain depth are summed but features at other depths are blurred out as in conventional tomography.
Q: The DAP meter on a unit has stopped working, do I need to stop using the unit?

A: No, you do not necessarily need to stop using the unit. You must make sure that for all exposures that are taken without a DAP meter, an indication of the dose that has been given – eg kV and mAs – is recorded.

The DAP meter should be repaired or replaced as soon as possible and Radiation Protection should be contacted when the repair has taken place so tests can be carried out to ensure that the meter is measuring accurately.

The results have been similar for most centres: some average doses exceed the national reference dose while others do not. Where doses exceed the national reference dose we have been working to establish why and if it is possible to further optimise doses.

Following the comprehensive dose audits that have taken place recently, we will now be consolidating our existing information by concentrating on just a few selected examinations for audit in the future. The examinations investigated each year will be rotated so all of the most common exposures are assessed. This will allow us to focus entirely on a group of examinations and compare doses between centres to provide a comprehensive assessment and investigation of how patient doses can be fully optimised.
**Field Safety Notice**  
30 Aug 2012  
Philips Brilliance CT Big Bore with software versions 2.4.7 or 2.4.8.

The system may open ‘e-stop’ when sitting idle causing all movements and scanning to stop.  
**Published by:** Medicines and Healthcare Products Regulatory Agency (MHRA)  

**iRefer: Making the best use of clinical radiology**  
2012

The 7th edition of the RCR’s imaging referral guidelines is at last available for free throughout the NHS. You can access the guidelines at the e-LfH Portal (see e-IRMER below).  
**Published by:** Royal College of Radiologists (RCR)  

**Good practice guide for clinical radiologists**  
2nd edition, 2012

This good practice guide outlines what should be expected of clinical radiologists and the framework that should be provided within departments of clinical radiology to support their activities. The main chapters address national guidance, hospital and departmental responsibilities, individual responsibilities and maintaining good practice. There are plenty of references to the regulations.  
**Published by:** Royal College of Radiologists (RCR)  

**Standards for patient consent particular to radiology**  
2nd edition, 2012

One of the many matters discussed in this report that need to be explained to a patient is radiation risk, especially when the procedure involves a relatively high dose. Advice is given about how to express this to a patient and reference is made to the Health Protection Agency’s website where a helpful document compares medical exposures with other sources of radiation.  
**Published by:** Royal College of Radiologists (RCR)  
[http://www.rcr.ac.uk/docs/radiology/pdf/BFCR(12)8_consent.pdf](http://www.rcr.ac.uk/docs/radiology/pdf/BFCR(12)8_consent.pdf)

Both published 2012

Required reading for all in the radiological fraternity, these two booklets are very thorough with comprehensive accounts of how to comply with the regulations and are packed with helpful, practical advice. They convey the SCoR’s view on a number of sometimes difficult aspects such as (under IR(ME)R) the required level of staff training, the roles of duty holders and establishing whether a female patient is pregnant, and (under IRR), how to undertake a risk assessment with useful examples supplied in an appendix.  
**Published by:** Society and College of Radiographers (SCoR)  

**e-IRMER**  
2nd edition, 2012

An interactive online training resource

e-LfH is a Department of Health Programme in partnership with the NHS and professional bodies providing high-quality content free of charge to train NHS staff. e-IRMER has been a long time coming but it’s here at last. You need an NHS or equivalent email address to register.  
**Published by:** e-Learning for Healthcare, (e-LfH)  
Quality assurance and quality control

We’ve probably all heard the terms quality assurance (QA) and quality control (QC), even if just as a mumbled excuse from a physicist who wants to commandeer your x-ray room. But do you know the difference between the two terms and is your department fulfilling its role in their implementation?

In simple terms, QA is asking questions such as ‘Are you actually doing what you think you are doing?’ QA has its origins in the armament factories of World War II.

Bombs need to do two things - explode when you want them to and not explode when you don’t. Introducing QA was the Ministry of Defence’s way of getting this right. Since then, the idea of QA has been applied to all areas of industry, including healthcare. In the context of medical imaging, it is the Ionising Radiations Regulations 1999 that require imaging equipment to be subject to a QA system. Implementation of this system should consist of two main areas: audit and QC.

Audit is generally the process whereby we look back on what we have done and decide whether it is adequate. This could be dose audits, image quality audits or procedural audits.

QC is the process whereby we examine our equipment to make sure it’s doing what we intend it to do. This is done mainly by radiographers and the Radiation Protection Service.

A test could be as simple as one image performed daily that allows a key parameter to be compared against previous values. If nothing has changed, it allows the user to start on the patient list knowing that there is nothing seriously wrong with the equipment and that their patients (and staff) will not be put at unnecessary risk either by radiation or by misdiagnosis from poor image quality.

Radiographer tests are designed to be quick and simple. This allows them to be performed regularly to show users that the unit is operating as it was before. It is these tests that answer a key question favoured by HSE inspectors: ‘How did you know that the unit was working correctly before you used it on a patient?’

In the next issue:
A QC example for radiography


Changes afoot in Personnel monitoring

The standard method of personnel dosimetry in radiology departments in the UK is to wear a single dosimeter on the trunk as a measure of effective dose to the whole body, which should not exceed the regulatory annual dose limit. During fluoroscopic procedures, the same dosimeter is worn under the lead rubber apron. Results over many years show that staff routinely do not receive measurable doses. The practice in interventional radiology and cardiology is for those most exposed to wear a second dosimeter outside the lead apron at collar level as a measure of eye or thyroid dose. The organs protected by the apron receive a negligible dose but organs not protected such as the thyroid and head may receive significant doses which also contribute to the effective dose. This contribution is not measured by the dosimeter worn under the apron and it has not been UK practice to combine the two recorded doses although some countries do. Significant eye doses are also received which may mean that some staff have to be designated as classified workers.

But things are changing: the ICRP (2011) have proposed a reduction in the annual dose limit to the eye from 150 mSv to 20 mSv averaged over 5 years with no single year exceeding 50 mSv. This is likely to be enacted into UK regulations with a dose constraint of 15 mSv per year.

The obvious consequence is that more interventionists are likely to become classified workers. A second is that UK practice may change in line with some other European countries such that a single dosimeter is worn at neck level outside the apron and thyroid collar. Martin (2012) in a well-reasoned editorial argues in favour of a change, pointing out that there is little merit in continuing to measure negligible doses to organs that are already protected.

With interventional procedures on the increase and compliance with personnel dosimetry already difficult to achieve in the interventional room, now is a good time to review the approach to personnel dosimetry. A single dosimeter that is visible above the apron will improve dosimetry compliance. Recorded doses will be readily measured and will give a better handle on radiation protection practices in the room. Doses to the eyes, thyroid and whole body can still be estimated using conversion factors that will need to be agreed nationally.

In the meantime, we have already changed our personnel monitoring strategy, which you will find in your employer’s Procedures for Ionising Radiation Safety (or ask us for a copy). It is not necessary to wear a whole body dosimeter in general radiology or fluoroscopy. Staff involved in interventional radiology and cardiology procedures must wear a body badge under their apron. In addition, for at least an initial trial period, the clinician undertaking the procedure must wear a collar badge outside the apron on the side nearest to the patient and a finger dosimeter worn on the little finger of the hand that is closest to the image receptor and x-ray tube (usually the left in a right-handed operator).

This is really important because significant doses can be received and they vary hugely depending on the procedure, technique used, orientation of the x-ray beam, difficulty of the case and whether protective glasses or the suspended screen are used. This additional monitoring may be stopped after the trial period, depending on the doses recorded. There will be more on the potential doses received by clinicians for different procedures and the value of the various shielding methods in the next newsletter.
COURSES

IR(ME)R Training for Non-Medical Referrers
22 August and 5 December 2013
A 2.5 hour mandatory course for nurses, physiotherapists, speech therapists and other extended-scope health professionals who intend to refer patients for x-ray, nuclear medicine examinations and CT scans under the Ionising Radiations (Medical Exposures) Regulations 2000 IR(ME)R and have to be appropriately qualified, trained and authorised.

Radiation Safety for Laboratory Workers
25 September 2013
A half-day course for laboratory workers, providing practical advice on the safe use of radioactive substances and compliance with radiation protection regulations.

Radiation Protection Supervisors in Diagnostic Radiology & Radiotherapy
10 to 12 July 2013
This three-day residential course covers the roles and responsibilities of Radiation Protection Supervisors working in Diagnostic Radiology and Radiotherapy. It is held at the Salomon’s Centre in Tunbridge Wells, Kent.

Laser Safety Awareness
This course is for those using lasers and provides a brief safety overview. For further information, please contact: Liz Chaloner, Clinical Scientist & Laser Protection Adviser, Tel 020 3299 1648, elizabeth.chaloner@nhs.net

For further information or to register for any of the above courses, please contact: Kim Channer, Radiation Protection & Course Administrator, Tel 020 3299 3537, kim.channer@nhs.net

King’s Radiation Protection Team

Patricia Clinch
Head of Radiation Protection & Radiation Protection Adviser
020 3299 3976
patricia.clinch@nhs.net

Elizabeth Chaloner
Principal Clinical Scientist & Laser Protection Adviser
020 3299 1648
elizabeth.chaloner@nhs.net

Navneet Dulai
Clinical Scientist
020 3299 1652
navneet.dulai@nhs.net

Dr Neil Lewis
Director of Medical Engineering and Physics & Radiation Protection Adviser
020 3299 1610
corneliuslewis@nhs.net

Mike Fitzgerald
Consultant Physicist
020 3299 3537
mike.fitzgerald1@nhs.net

Jonathan Cole
Clinical Scientist
020 3299 1640
jonathan.cole@nhs.net

Tessa Arscott
Principal Clinical Scientist
020 3299 1647
tessa.arscott@nhs.net

Donna Lyons
Clinical Technologist
020 3299 1641
donna.lyons@nhs.net

James Clinch
Clinical Technologist & QC Lead
020 3299 1712
james.clinch@nhs.net

Kim Channer
Radiation Protection & Course Administrator
020 3299 3537
kim.channer@nhs.net