The Radiographic Assistant Practitioner's role in Quality Control of Radiological Equipment

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Background

Radiographic Assistant Practitioners (AP), like general support staff, are likely to be from diverse backgrounds but they differ from the general support workforce in that, as part of their duties, they perform limited clinical imaging examinations in concert with, and under the supervision of, HCPC-registered Radiographers.

The Society and College of Radiographers (SCoR) receives requests from the UK diagnostic radiography community pertaining to the scope of practice of the qualified AP. One such request is the need for guidance on the AP's role in Quality Control (QC) of radiological equipment. This briefing details such guidance and has been produced in collaboration with the Institute of Physics and Engineering in Medicine (IPEM). The Society and College of Radiographers wishes to gratefully acknowledge the support and advice of the IPEM Diagnostic Radiology Special Interest Group in the development of this guidance briefing.

Introduction

The use of radiological equipment is governed by the Ionising Radiations Regulations 2017 (IRR 17) and the Ionising Radiation (Medical Exposure) Regulations 2017[1] (IR(ME)R) (IR(ME)R, 2018 in Northern Ireland[2]) – the latter two hereafter are referred to as IR(ME)R.

From the regulations and for the purpose of this guidance:

*"**quality assurance**" means all those planned and systematic actions necessary to provide adequate assurance that a structure, system, component or procedure will perform satisfactorily in compliance with generally applicable standards and quality control is a part of quality assurance;*

*"**quality control**" means the set of operations (programming, coordinating, implementing) intended to maintain or to improve quality and includes monitoring, evaluation and maintenance at required levels of all characteristics of performance of equipment that can be defined, measured, and controlled;*

The regulations require the employer to ensure any diagnostic x-ray equipment is capable of restricting exposures in line with the "as low as reasonably practicable" (ALARP) principle. Employers must establish a quality assurance (QA) programme to ensure compliance of the regulations. The QA programme must include:

- Adequate equipment testing before it is first put into clinical use (QC)
- Adequate equipment testing at appropriate intervals and after any major maintenance (QC)
- Appropriate measurements at suitable intervals to assess representative doses to persons undergoing medical exposures (QC)

The employer must also take all reasonable steps to prevent failure of equipment that could lead to greater than intended exposures of ionising radiation and to limit the consequences of such failure.

Regulation 15 (3)(c) of IR(ME)R and regulation 33 (3) of IRR require the employer to undertake adequate performance testing at regular intervals. The employer should consult the appointed the Medical Physics Expert (MPE) about the QC programme. There are also many guidance documents[3,4,5] containing recommended standards for the QC of equipment.

The QC operating procedure should

- specify the frequency of testing;
- contain a written protocol detailing how to perform the testing;
- contain appropriate action level(s) for each test result;
- identify the remedial actions required in the event that the action level(s) are exceeded;
- make clear who has responsibility for carrying out the testing;
- make clear who has responsibility for acting on adverse findings.

Under IR(ME)R, it is for the employer to decide who undertakes the testing – this can be the employer's own staff or contractors. Anyone performing QC of radiological equipment is regarded as an IR(ME)R operator. When QC is undertaken, it is important that relevant aspects of the Ionising Radiations Regulations, 2017 (IRR, 2017)[6] are adhered to – this includes compliance with the Local Rules and arrangements for personal monitoring.

With their familiarity with the equipment and their knowledge of the department in which they work, APs are well placed to undertake equipment QC. Before the AP can undertake this operator duty,

IR(ME)R requires the following:

a. that the AP is adequately trained as an IR(ME)R operator (according to Schedule 3), with provision made for ongoing training;
b. that the AP is entitled, in accordance with the employer's procedures, to act as an IR(ME)R operator with a scope of practice that includes the QC tests they perform and the equipment on which they perform these tests;
c. that there is a written protocol covering the practical aspects of the QC that is performed;
d. that the AP, in their capacity as an IR(ME)R operator, follows the employer's procedures.

This guidance briefing outlines the steps to be taken when an employer wishes to entitle their APs to perform equipment QC.

Entitlement under IR(ME)R

Entitlement of APs to perform equipment QC should not be considered until all other steps in this guidance briefing have been completed. The entitlement should allow the AP to be identified, whether by name or designation. It should also include their defined scope of practice, including the tests they are permitted to undertake and the equipment on which they are permitted to perform these tests. The date on which they were entitled (or dates if it varies with equipment or test) and a schedule for a review of their training records and entitlement should also be included. Since the

employer will have entitled radiographers as IR(ME)R operators, a good first step will be to use the same entitlement documentation and amend it to suit this case.

Written procedure

A detailed protocol is required for each test that is being undertaken. The protocol should include sufficient information as to allow the test set-up and technique to be accurately reproduced. It will, therefore, require detailed information on the following for each test being undertaken:

- the test equipment to be used;
- the positioning of the x-ray equipment and test equipment;
- the exposure factors;
- the result to be recorded following the test, including where to record it;
- the action level(s);
- the remedial actions required in the event that the action level(s) are exceeded;
- if the remedial action is to escalate it to senior staff, their contact details should be included;
- if the remedial action is to withdraw the equipment from use, details on how that is to be communicated to all potential users should be included;
- where to record details on the action taken in the event that action level(s) are exceeded.

The choice of action levels and remedial actions is a local decision that should be taken with expert advice. Usually this will have come from the MPE.

In compliance with IR(ME)R, all procedures require periodic review. Therefore this protocol should be subject to regular review (generally annually, though to be decided locally). It should also be reviewed when the equipment is replaced, updated or modified in any significant way or if there are concerns raised about the equipment's performance. In all cases it should be updated as necessary.

Training

Adequate training involves both theoretical and practical elements. The theoretical elements must be cross-referenced against schedule 3 of the IRME Regulations to ensure adequate training as an IR(ME)R operator; much of this will have been covered in the AP's pre-qualification education as well as any further training to date. An understanding of the written procedure for QC testing of all equipment that is to be included in the AP's scope of practice is essential.

Practical elements will involve meeting pre-determined competencies. The means of demonstrating and assessing competence should be identified and documented in advance of the AP's training. Competencies must include the correct recording and interpretation of the results with respect to the action level(s) and a demonstration of what to do when action level(s) are exceeded.

When the AP has covered the theoretical and practical components he/she may then be signed off as competent by a suitably trained and entitled IR(ME)R operator. Provision must be made for on-going training to maintain competence. Competence and ongoing training should be recorded on the AP's training matrix and signed and dated by the supervisor.

Following the employer's procedures

At this stage, an AP might be ready to be entitled by the employer or to have their scope of practice increased on an existing entitlement. As an IR(ME)R operator, they are legally responsible for the practical actions they undertake and must follow the employer's procedures at all times. The AP should be made aware of this prior to their being entitled by the employer and, as with other staff, they should know the limitations of their practice.

The SCoR expects that any AP in membership maintains their place on the College of Radiographers (CoR) Voluntary Register for Accredited APs.[7,8] The SCoR Accredited AP in SCoR membership is covered by the Professional Indemnity Insurance *(9)* for all IR(ME)R duties providing there is evidence of adequate training, entitlement and compliance with the employer's procedures.

References

1. The Ionising Radiation (Medical Exposure) Regulations (IR(ME)R) 2017

http://www.legislation.gov.uk/uksi/2017/1322/regulation/10/made

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http://www.legislation.gov.uk/nisr/2018/17/contents/made

3. Institute of Physics and Engineering in Medicine Measurement of the Performance Characteristics of Diagnostic X-Ray Systems. IPEM Report No 32 Parts 1-7. York: IPEM (1996‑2010)

4. Institute of Physics and Engineering in Medicine Recommended Standards for the Routine Performance Testing of Diagnostic X-Ray Systems. IPEM Report No 91, York: IPEM, 2005

5. Institute of Physics and Engineering in Medicine Medical and Dental Guidance Notes. York: IPEM, 2002

6. The Ionising Radiations Regulations 2017 London: HMSO, 2017
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7. The College of Radiographers Accreditation Scheme for Assistant Practitioners

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8. The Society and College of Radiographers Voluntary Register of Accredited Assistant Practitioners

https://www.sor.org/career-progression/assistant-practitioners/accredited-ap-register

9. The Society of Radiographers Professional Indemnity Insurance

https://www.sor.org/being-member/professional-indemnity-insurance

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