

EDITORIAL

Improving radiation protection amongst the UK vascular surgery workforce

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Introduction

The use of ionising radiation in the UK is regulated nationally through legislation. The legal requirements for employers for the protection of radiation exposed workers are detailed in Ionising Radiation Regulations 2017 (IRR17),¹ Ionising Radiation (Medical Exposure) Regulations 2017 (IRMER17)² and Ionising Radiation (Medical Exposure) (Amendment) Regulations 2018,³ with the ultimate responsibility for their enforcement sitting with the Health and Safety Executive (HSE), Britain's national regulator for workplace health and safety.

IRR17 stipulates that exposure to ionising radiation arising from work activities should be kept 'as low as reasonably practicable' (ALARP), also known as 'as low as reasonably achievable' (ALARA). Every employer therefore has a legal obligation to minimise the extent to which employees are exposed to ionising radiation by using a range of measures.¹ These include providing systems of work which restrict exposure to ionising radiation and provision of adequate and suitable personal protective equipment (PPE) to all those exposed to ionising radiation. IRR17 also requires employers to ensure that all practitioners and operators are adequately trained for their role and undertake continuous education and training, outlining the obligation of employers to monitor, record and maintain records relating to radiation exposure.¹

The survey published in this issue of the *JVSGBI* highlights a worrying disconnect between legislation and practice across the UK. Whilst it demonstrates deficiencies in knowledge, access to personal radiation protection and failures to monitor individual exposure to ionising radiation affecting the UK vascular surgical workforce, this is by no means a problem isolated to this group.

It affects all healthcare professionals working with ionising radiation, including interventional radiologists,⁴ trauma and orthopaedic surgeons,⁵ urologists⁶ and cardiologists.⁷ The solutions therefore require a cross-specialty approach with national standards and processes put into place. This will ensure that every specialty and the wider team, including anaesthetists, radiographers, nursing staff and surgical care practitioners, are afforded the same levels of workplace protection against ionising radiation. Despite the size of the task, protecting the workforce from preventable harm should be a priority for everyone. Moreover, the consequences of inaction are profound.

Education

The lack of awareness and knowledge of ALARA principles, a failure to consistently utilise these principles in practice, and a lack of awareness of local radiation policies seen in this survey, with one in four resident doctors in vascular training and one in 10 vascular consultants reporting not having undertaken any radiation safety training, highlight significant failures to successfully embed radiation protection education into vascular surgery training programmes, continuous professional development for consultants and clinical practice. National standards for training in radiation protection should be advocated. For consultants, this could form part of their trust mandatory training and, for resident doctors, evidence of training in radiation protection could be assessed at ARCP in the second Generic Professional Capability, the Professional Skills domain, whereby the safe use of medical devices and equipment must be demonstrated, and as a component of work-based assessments.

Although mandatory training gives organisations the assurance of completion of

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training, courses do not necessarily translate into behavioural change. The various methods for effective delivery of radiation protection training should be considered. Face-to-face training used to form part of the national Annual Specialist Registrar Education (ASpiRE) programme for resident doctors in vascular surgery training programmes, but this has been replaced by national online teaching. An interactive online training course for the entire endovascular team has been shown to significantly improve radiation safety knowledge of the team,⁸ and we know that team-based training can enhance patient safety behaviours in other areas of surgery.⁹ However, the benefit of online versus face-to-face training methods and their translation into improved radiation safety behaviour requires greater evaluation. The intervals at which training should be delivered for optimal effect also requires attention, with IRR17 recommending training every 5 years, which is in contrast to the International Commission on Radiological Protection (ICRP) recommendation for training to be updated at least every 36 months.¹⁰ The evidence base for these recommendations is unclear.

A concerted effort is required by all healthcare professionals, clinical leads, trust radiation protection advisors (RPAs) and NHS Trusts to ensure that the training received in radiation protection translates into ALARP practice in the workplace.

Improving access to personal protective equipment (PPE)

The survey highlights the alarming barriers resident doctors in vascular surgery and, to a lesser extent, consultants face in accessing the necessary PPE. Their trainee status and lack of permanency due to the rotational nature of surgical training appears to be the main reasons for lack of access to PPE. Resident doctors were also less likely to ask for PPE, with the survey providing an impression that trainees feel the need to prioritise their presence in an endovascular procedural environment over raising concerns about the availability of protective equipment, to fulfil procedural competencies.

For resident doctors and other staff who are new to an NHS Trust, induction would seem the most opportune time to be introduced to the RPA, be made aware of local policies and ensure that radiation protection training is up to date. It would also be the ideal time to be allocated personal dosimeters, or equivalent, and ensure provision of a minimum standard of PPE, to include appropriately fitted gender-specific gowns, thyroid collars and lead glasses, with additional protection with leg or tibial shields considered in high dose environments, as per the European Society for Vascular Surgery (ESVS) 2023 Clinical Practice Guidelines on Radiation Safety.¹¹

Radiation passports

The development of a radiation passport documenting the radiation exposure throughout a career would provide a more robust mechanism and embed the requirement for an employer to give feedback on personal dosimeter readings, potentially improving

clinician engagement and compliance with dosimeter usage. It would also overcome the problems of data being 'lost' as resident doctors rotate through placements.

The case for a national registry

The health-related effects of ionising radiation can be devastating, impacting on the mental and physical health of an individual and their families. One in four resident doctors in vascular surgery training and consultants experienced health conditions potentially related to working with ionising radiation. Whilst much is still unknown about the long-term effects of ionising radiation on health, establishing a register to document conditions which may be associated with working with ionising radiation would go a long way towards creating a culture of openness and transparency in the NHS surrounding radiation protection. We do not underestimate the challenges of who would hold or monitor the register; however, without such data collection we will remain in the dark about the excess risk of occupational exposure. A register would look for trends which could further increase our knowledge of the impact of working with ionising radiation on the workforce, allowing us to develop and/or refine current strategies to minimise their effect.

Whilst the focus of the survey and this editorial has been on improving radiation protection for healthcare professionals, it should be noted that this will undoubtedly translate into improvements in radiation protection for patients and patient safety.

Conclusions

This survey supports the need for urgent reform nationally with the development of clear robust education and training pathways in radiation protection, the development of appropriate standards of PPE and governance structures which will ensure annual and lifetime exposure to occupational radiation is accurately recorded. Protecting the workforce must be the priority and there are several workable solutions available. The responsibility for the safe use of radiation sits with the HSE and NHS trusts as employers. However, the bodies responsible for training and ensuring the well-being of the UK workforce need to take up the challenge of bringing about change. Moreover, for change to be successful, it is vital that all healthcare professionals engage in the process and provide the leadership creating awareness along with monitoring and recording safety for staff and patients.

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