

United-Kingdom health service trust prosecuted by health and safety executive for overexposure of an interventional radiologist

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Case details

In 2009 the National Health Service Trust in question purchased a new CT scanner. This scanner had the additional feature of being able to be operated in “CT fluoroscopy” mode. The scanner was used for conventional CT work as well as for carrying out biopsies. The traditional method for carrying out biopsies used by the consultants in the Trust involved them leaving the room when the x-rays were on.

In August 2011 the Trust appointed a new Interventional Radiologist. As part of his duties he was required to carry out biopsies using the CT scanner. This consultant was previously employed in Germany where he used a different method to carry out biopsies utilising the real time fluoroscopy function of a different manufacturers CT scanner. Despite not being familiar with the mode of operation of the scanner installed at the Trust he decided to use the same method as he had in Germany, which involved him standing next to the CT scanner and operating the x-rays himself using a foot pedal on the machine whilst observing real time images on the screen inside the CT room.

The other consultants had initially tried a version of this method when the CT scanner had been purchased but didn't like it and they advised the consultant of this, however, he insisted that his method was better and that he would continue using it. The other doctors and managers deferred to his apparent “greater knowledge”. This continued to be the case even when several managers and the Radiation Protection Supervisor (RPS) noted that the biopsy images demonstrated that the consultant had his hands in the main x-ray beam whilst carrying out procedures. The consultant was not directly challenged about his work practices by the management of the Trust.

The consultant gave the impression that he knew how to operate the CT scanner, although it later became apparent that he was operating the scanner with the x-rays “on” for periods up to

30 seconds at a time. In fact, the only reason the x-rays terminated after 30 seconds was due to the scanners thermal protection settings preventing the x-ray set overheating.

Within the Trust matters finally reached a head when the Consultant was provided with finger TLDs in November 2011 sometime after he had begun carrying out CT guided biopsies using his technique. Prior to this he had only been issued with a whole body TLD as no finger TLDs had been ordered for him nor were any spares available. The finger TLDs were worn for 2 months and on analysis indicated a skin radiation exposure in excess of 500mSv, which is the annual dose limit for skin or extremities in the Ionising Radiations Regulations 1999 (IRR99). Once this came to light the consultant was prevented from carrying out further biopsy work. In carrying out its own investigation into the incident the Trust estimated that his actual exposure was likely to have exceeded 1 Sv. The consultant did not exhibit any form of immediately apparent radiation injury.

Failings under Ionising Radiations Regulations 1999 (IRR99)

The Trust failed to carry out a suitable and sufficient risk assessment of the work carried out by the interventional radiologist using CT fluoroscopy. A risk assessment had been carried out for routine CT work but was not extended to include CT fluoroscopy when it became apparent that this was being carried out. The Trust had its own appointed Radiation Protection Adviser (RPA) but he was not consulted at any time on any matters relating to CT fluoroscopy.

As a consequence there was no consideration made as to whether or not the radiation exposure of the interventional radiologist or his patients were being kept as low as reasonably practicable. No local rules of systems of work were, therefore, developed or the possible use of engineering controls such as the use of needle holders considered.

In addition the Trust did not assess whether the consultant should be considered as a classified person and be issued with appropriate radiation monitors. Normal custom and practice was to provide routine monitoring of finger dose for all interventional radiologists, but in this case the Trust had none available when he started work and waited until the next issue period to provide them.

When the radiation exposure of his fingers was actually measured the dose recorded in the 2-month wear period exceeded the annual dose limit of the skin of 500 mSv.

Court details

As a result of the above failings, on 7 October 2013 the NHS Trust were fined a total of £30 000 in the Magistrates' Court for breaches of the Ionising Radiations Regulations 1999 in respect of not having a suitable and sufficient risk assessment in place and for exceeding the dose limit to the skin.

Lessons to be learned

It is imperative that organisations have proper procedures in place for managing new staff to ensure that they are given suitable information, instruction and training to ensure that they work in a safe manner and in accordance with the organisation procedures for radiation protection. All staff, whatever their perceived status, must be managed to ensure they follow good radiation protection practice.

All new work activities must be properly risk assessed. IRR99 gives comprehensive guidance on the matters that need to be considered when carrying out a suitable and sufficient risk assessment. Those persons carrying out the risk assessment must liaise with those actually carrying out the task. The RPA has a key role to play in assisting employers in producing risk assessments. All subsequent arrangements that are required to ensure radiation exposures are kept as low as reasonably practicable arise from the findings of the risk assessment.

Enforcement action was also taken by the Ionising Radiation (Medical Exposure) Regulations enforcing authority for England, the Care Quality Commission (CQC), in relation to this issue.