Spanish experiences on radiation protection training in medicine

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2 Introduction

Radiation protection (RP) training of physicians and supporting personnel in the healthcare use of ionizing radiations is particularly challenging for many reasons unique to healthcare: Use of radiation is a matter of health benefit versus health risk and radiation safety is sometimes not the key issue, radiation doses can range from trivially small to potentially lethal, technological sophistication of equipment and advances in procedures are rapidly progressing and physicians often see some forms of mandatory training as a waste of their time (WA01).

Radiation protection training in medical installations is required in Spain by: a) the Regulatory Authority (Nuclear Safety Council) and b) the Health Authority (Autonomous Communities, co-ordinated by the Ministry of Health).

The Regulatory Authority requires training in all the aspects concerning occupational and public exposures and has the legal competence to evaluate this training and to issue licenses or accreditations to people involved in the supervision and operation of the radiation sources. These people are medical doctor's specialists in diagnostic radiology, nuclear medicine and radiotherapy, together with some other medical specialists using mainly X ray systems (cardiologists, dentists, etc), medical physicists, maintenance engineers, radiographers and radiotherapy technicians. Dentists and podiatrists are also included in the regulation when using x ray systems. This requirement is quite old in Spain (since 1964) for radiotherapy and nuclear medicine installations and was updated for x rays in 1991 (RD91, VA91).

Only recently, and in relation with the European Directive 97/43/Euratom (CD97), the Health Authority required some additional RP training for patients, together with the implementation

of quality assurance programmes for medical exposures (RD97, 98, 99, 01).

In general terms, Spain is following the European Guidelines on education and training in radiation protection for medical exposures (EC00).

Radiation Protection Training at Medical and Dental Schools

Some recommendations about the implementation of RP contents (or specific RP courses) in Medical and Dental Schools were issued by the Spanish Ministry of Health and the Ministry of Education some years ago. Now, in almost all the Spanish Universities, this RP training is offered as part of the curricula (but at present time, as a voluntary basis for students). Very recently, the National University Co-ordination Board at the Ministry of Education has approved to consider this RP training as mandatory (with a minimum of 30 hours of training at the Medical Schools) and this will be implemented during the next years (PE03).

3 Training of the Medical Physics Experts

Since 1997 (RD97b), Medical Physics specialists are recognised in Spain at the same level that other medical specialities. Candidates to this speciality require 5 years at the university (to obtain the physics degree or engineering or other scientific degrees with a high physics and mathematics). There is a national examination with 15-20 places per year to have access to a 3 year residency period (paid by the National Health Service), with theoretical and practical training in Medical Physics departments of accredited teaching hospitals. Training is organised in the four areas with the suggested time of: 18 months for radiation therapy, 12 months for diagnostic imaging (Radiology and Nuclear Medicine) and 6 months for radiation protection (EU01).

4 Interventional radiology

One of the most important efforts made during the last years has been in relation with the training of RP for interventional radiology that is required in the Spanish law, as a “second level of training” for these specialists, as recommended by the International Commission on Radiological Protection (IC00) and the European Guideline (EC00).

A close collaboration between the Ministry of Health and some Universities with the Spanish Society on Vascular and Interventional

Radiology (SERVEI) has been established to start with the accreditation of interventionists in the second level of training in RP (additional level to the general one required to all the diagnostic radiology specialists).

The Royal Decree on Quality Criteria for Diagnostic Radiology in 1999 (RD99) requires for interventional practices:

a) Laboratories or fluoroscopic screening rooms specifically designed for these procedures.
b) Imaging systems specifically designed for interventional procedures (in compliance with International Electrotechnical Commission standards).
c) A system for measuring and registering doses received by the patients.
d) An accreditation in RP (called "second level", to differentiate it from the first level which is mandatory for all the radiologists (RD91)) for the specialists conducting these procedures. This accreditation shall be supervised by the Health Authority.

In June 2000, SERVEI, in co-operation with the Complutense University of Madrid (Medical Physics Group), organised a pilot course with a large practical content to obtain the legal accreditation referred to above. The intention was to offer this pilot course to the most senior Spanish interventional radiologists, then to decide if the duration (2 and a half days) and content (VA01, EC00) could be appropriate for a wider audience, and further to establish the programme as part of the regular training for all specialists practising interventional procedures.

A final examination (comprising of a set of 50 multiple choice questions with 4 alternatives) was also included. Achievement of a set minimum score was a condition of accreditation.

The Health Authority (Spanish Ministry of Health in that date) gave the accreditation to the course on June 2002. The Authority considered that the programme and planning as presented, following the recommendations of the European Guidelines (EC00), satisfied the legal conditions.

A similar training for interventional cardiology is awaiting and some meetings have been foreseen between the Regulatory and the Health Authority trying to agree a common training programme to

obtain the simultaneous accreditation of the Regulatory and Health authorities.

The interactive training CD-ROM "MARTIR" (MA02) edited by the European Commission, is being distributed widely in Spain and used as an intermediate training tool until residents or fellows have the possibility to attend a specific training course.

5 Training of the Medical Doctors using ionizing radiations

A working group has recently been promoted by the Ministry of Health, with all the medical specialities using ionising radiations, to implement RP training during the residency in that specialities: Radiotherapy, nuclear medicine, diagnostic radiology, traumatology, urology, labour medicine, vascular surgery, cardiology, etc, have been involved.

The RP training of the senior specialists (when lacking) will probably be organised in specific courses as part of the continuous education programmes.

Cardiology specialists are considered a singular case due that only a small number of them will practice interventional cardiology. For these specialists the RP training will probably be offered in specific courses and not during the residency.

6 Training auditors of the Health Authority

Specific pilot courses to train auditors from the Health Authority, in quality assurance (QA) and RP in diagnostic radiology, nuclear medicine and radiotherapy, have also been priorities from the Spanish Ministry of Health during the last years. Pilot courses have already been made for the three specialities and it is presumed that his training will help in the accreditation and audit of the mandatory QA programmes.

7 Future challenges

A forthcoming problem in the next future will be the training in RP for some medical specialists arriving to the interventional arena without any previous knowledge in basic radiation physics. It is expected to follow the recommendations of the European Guidelines (EC00) but until now these specialists are not fully accredited in RP.

Other procedures such as intravascular and intracoronary brachytherapy, sentinel node techniques, etc, will also require some

additional RP training for the surgeons, radiologists and cardiologists involved in the multidisciplinary teams performing that procedures.

Specific RP and QA training for digital radiology will also be a challenge due to the fast introduction of this new technology and the specific requirements in RP required.

8 Conclusions

Spain has done an important effort during the last years to implement the Medical Exposures Directive and the radiation protection training aspects. The legislative framework has already been established but there still are important aspects to be put into practice especially in the implementation of RP training at the medical schools, during the residency of some medical specialities and for interventional and digital radiology.

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