

# Experiences from training courses of National Committee for implementation of QA in radiology in Slovakia

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## **Abstract**

Council Directive 97/43/EURATOM establishes that member states shall ensure that practitioners and technical staff in medical practice have adequate theoretical and practical training for the purpose of radiological practices as well as relevant competence in radiation protection. This is considered as a basic aspect of optimization of medical exposure. A general background of the required level of training in radiation protection is given in Guidelines on education and training in radiation protection in medical exposures published by European Commission (116/2000/EURATOM). The aim of our paper is to refer about a new education system. Recommendation for continuing education and training is given and new techniques are implemented. The introduced quality assurance and quality control programs were realized in the framework of activities of the Committee of QA and QC in radiology under auspice of Slovak Health Ministry.

## **1. Introduction**

The main emphasis of the implementation of the Medical Exposure Directive 97/43/EURATOM in the Slovak legislation is to provide adequate theoretical and practical training for purposes of radiological practices in radiation protection. It is one of the most important tools for preparing the professionals in the field of radiodiagnostics, radiotherapy and nuclear medicine. Taking into account the advances in the new techniques used in radiology training programs are established and qualifications and certifications required. According to the Directive special training should be organised for personnel that work with children, in screening programmes and with high dose technique, because the greater sensitivity of children to radiation in paediatrics, the exposure on healthy individuals in screening procedures and the application of high doses in interventional radiology or CT scan. In addition it is needed to enhance the safety and efficacy of medical applications by systematic education in radiation protection at different levels. [1]

The paper deals with ambitions of specialists in radiation protection, in cooperation with National Committee of Health Ministry for implementation of QA programs in radiology to elaborate TARGET PROGRAM devoted to systematic education criteria for all incoming staff and to update and retrain this staff in accordance with European Guidelines given in RP 116. [2]

## **2. Outline of educational and training strategy in Slovakia**

Development of radiation protection, that has a multidisciplinary character, was not in an adequate way present in educational plans and programs at the Slovak universities in the fields of technical, biotechnical, medical and social sciences. The key to solving this problem is in defining minimal common bases for all teaching plans and programs that can be used by all colleges that are involved in this field, directly or indirectly. The other step is to organize special and graduate studies at the university level for all the colleges offering bases of radiation protection.

Education and training of medical personal on the safe uses of radiation and lowest doses delivered to patients must rationally place into perspective the health benefits and radiation risks. To guarantee that each individual patient will receive the best available care for his disease an effective quality system have to be established. [3]

One of the major problems facing the specialist in our country today is the expanding use of radiation by physicians who are certified in their profession but have inadequate training in radiation management. When this phenomenon occurs a practical resolution to the issue is required. Because radiation is now widely used in radiology, cardiology, neurosurgery, urology, orthopedics, pulmonology and other disciplines, a significant priority is the adjusting of training and education so, that they meet this changing challenges. One of the way to achieve this goal is to introduce unified quality assurance and quality control programs for individual types of examinations and specializations and to establish

national standards for fulfilling of QA and QC programs created during the national audits. In the framework of this work is training and education one of most important part.

### 3. Practical demonstration of our experiences in implementation of QA/QC in mammography

The importance of adequate training and education of local practitioners in radiology is highlighted on national coordinated two stage audit performed at 42 mammography departments in the Slovak republic. The organization of preventive mammography in Slovakia required not only a strict regulatory process and high quality requirements for physicians, technologists and physicists with regard to initial training before they can practice mammography, but also realization of fully documented continuing work and education. Preparing of forced documentation for regularly repeated training courses was necessary.

The first step of strategy of Slovak national audit was the establishment of a Committee of QA and QC in radiology under auspices of Slovak Health Ministry. The Committee developed clearly defined and documented procedure for achieving the QA/QC at radiography departments. Criteria for realizing QA program in form of a manual were outlined, having the following items:

- detailed instruction of performance standards with tolerance limits established for QC test (daily and weekly)
- adequate training for radiologist as well as radiographers in the area of QC and dosimetry
- sample forms, worksheets, charts and records used for QC testing
- standardization of exposure (positioning, loading factors, ESD)
- guidelines for acceptance criteria for diagnostic radiograms
- QA program review. [4]

In spite of some practical limitations at the beginning of the optimization process, the results obtained in the 3 year's duration of the mammography audit have demonstrated the improvement of quality of clinical images as well as technical parameters. [4]

Some examples of the evaluation are given in figures 1 and 2 and in the table 1. They demonstrate the usefulness in day to day assessment of mammography images as part of QC program.

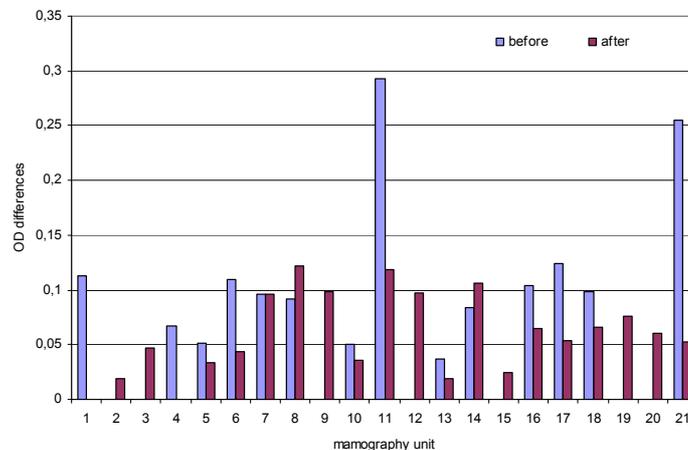


Fig. 1: Long-term reproducibility in mammography departments before and after QA implementation (part 1)

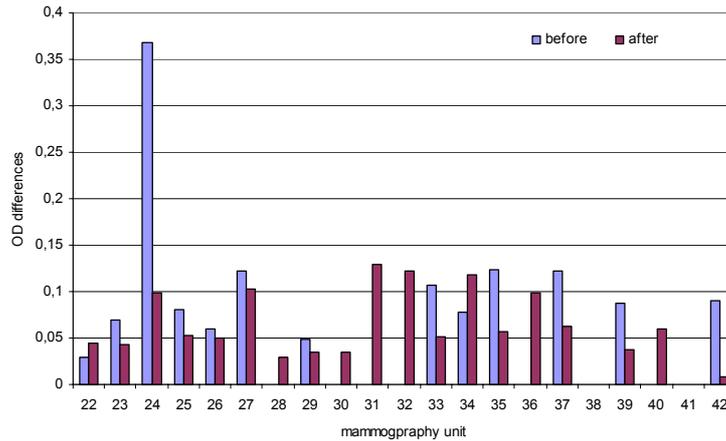


Fig. 2: Long-term reproducibility in mammography departments before and after QA implementation (part 2)

	Object thickness compensation	Long term reproducibility	Phantom image quality evaluation
Before QA implementation	34,5 %	10,3 %	6,9 %
After QA implementation	4,5 %	0	12,8 %

Table 1: Analyses of the results - percentage of non-fulfilled criteria

#### 4. Conclusions

The experience gained from national coordinated programs aimed to optimize radiological protection in diagnostic radiology has shown to be a sound method of confirming an adequate level of diagnostic information. The main advantage has to be seen in its educational value and in the possibilities to reduce deficiencies in experimental technique by adequate training.

#### References

- [1] Council Directive 97/43/Euratom, On Health protection on individuals against the danger of ionising radiation in relation on medical exposure. EC 1997
- [2] Radiation Protection 116: Guidelines on education and training in RP for medical exposures. EC 2000
- [3] Ftacnikova, S., Nikodemova, D.: Some comments concerning R&D and education in radiation protection in Slovakia. In: Proc. of IRPA Regional Congress, Bratislava 2003
- [4] Horváthová, M., Nikodemová, D.: Quality assurance programme at Slovak mammography departments. In: Proceedings of Ninth national conference on Biomedical physics and engineering, 14-16 october, 2004, Sofia, pp.61-65

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