

Web based tools for quality assurance and radiation protection in diagnostic radiology

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Practical and philosophical aspects of radiation protection in diagnostic radiology have changed very little over the past 50 years even though patient doses have continued to rise significantly in this period. This rise has been driven by technological developments, such as volume Computed Tomography (CT), that has been able to improve diagnostic accuracy but not necessarily provide the same level of risk-benefit to all patients or groups of patients given the dose levels involved. Can practical radiation protection strategies hope to keep abreast of these ongoing developments?

A project was started in 1992 in Liverpool that aimed to develop IT driven Quality Assurance (QA)/radiation protection software tools based upon a modular Quality Assurance Dose Data System (QADDS). One of the modules involved the assessment of the patient Entrance Surface Air Kerma (ESAK) for an x-ray examination that was based upon the use of calibrated x-ray tube exposure factors to calculate ESAK as well as collecting appropriate patient details (age, sex, weight, thickness etc). The package also contained modules for logging all necessary equipment performance QA data.

This paper will outline the experience gained with this system through its transition from a locally application on a stand alone PC within the department to the current web based approach. Advantages of a web based approach to delivering such an application as well as centrally storing data originating on many hospital sites will be discussed together with the scientific support processes that can be developed with such a system. This will include local, national and international considerations.

The advantages of importing x-ray examination details directly from other electronic storage systems such as a hospital's Radiology Information System (RIS) will be presented together with practical outcomes already achieved. This will include the application of statistical techniques to the very large data sets generated. The development of new examination QA performance indicators will be discussed.

The application of web based IT tools for QA and radiation protection in diagnostic radiology is already opening up the possibility of developing new and improved scientific support services as well as research possibilities in radiological informatics. These will be outlined together with areas for possible future development by the medical physics community.