Evaluation of dose and risk due to interventional radiology techniques

Fact Sheet

Project Information

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Project closed

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No data

Coordinated by
Nürnberg Hospital
Germany

Objective

The frequency of performance of specific interventional procedures was determined for the different countries, and exemplary dose measurements on patients and personnel were performed for different techniques. On the basis of the data obtained and the measured values risk-relevant dose rates can be provided with regard to their potential for stochastic effects to the patients. The deterministic effects - especially to the skin - as a result of interventional procedures (mainly in cardiology) have attracted great attention. For this reason not only the dose area product of

different procedures, but also the entrance surface dose had to be determined for the definition of risk-relevant doses.

For an effective radiation protection for the patients, special requirements have to be met at interventioanl units. As shown in the different reports, the most important aspects are properly functioning equipments, complemented by dosimetry on both the patients and the physicians and personnel involved in the use of the equipment, as well as good training and further eduction of the physicians. These demands include above all improvements of the equipment such as additional filtration or indication of the dose rate or the cumulative dose. It is recommended to establish reference dose rates for each of the different interventional procedures. The reports of the different countries for interventions performed in the various medical disciplines such as cardiology, neuroradiology or angiology show comparable dose values. The members of our working group feel that the further eduction and training of the personnel involved in interventional radiology procedures is of high importance.

The sometimes relatively high dose rates per intervention that were reported by the different participants in the project underline the demand for optimum radiation protection at all units where interventions are performed. Another demand is the control of the doses to the personnel involved in these procedures, at regular time intervals. From the measured values a maximum dose value can be set for the physicians and the personnel performing or assisting in interventional procedures requiring high doses, to avoid an exceeding of these limits.
TITLE: EVALUATION OF DOSE AND RISKS DUE TO INTERVENTIONAL RADIOLOGY TECHNIQUES.
THIS COORDINATED PROJECT HAS THE GENERAL OBJECTIVE "OPTIMISATION OF THE RADIATION PROTECTION" AND AIMS AT IMPLEMENTING ALL RELEVANT INITIATIVES WHICH CAN REDUCE BOTH OCCUPATIONAL AND PATIENT RADIATION RISK IN DIAGNOSTIC RADIOLOGY.
ALMOST ALL THE LABORATORIES INVOLVED IN THIS PROJECT HAVE CONSIDERABLE PAST EXPERIENCE IN THIS FIELD AND HAVE SIGNIFICANTLY CONTRIBUTED TO THE IMPLEMENTATION OF OCCUPATIONAL AND PATIENT DOSE REDUCTION STRATEGIES WHICH UNDERPIN THE EURATOM DIRECTIVE 84/466 LAYING DOWN BASIC MEASURES FOR RADIATION PROTECTION OF PERSONS UNDERGOING MEDICAL EXAMINATION OR TREATMENT. THE PROJECT IS CONCERNED WITH TWO BASIC AREAS OF RADIATION PROTECTION IN MEDICINE:
1) QUALITY ASSURANCE (QA) AND QUALITY (QC) IN INTERVENTIONAL RADIOLOGY; 2) OCCUPATIONAL AND PATIENT DOSE ASSESSMENT.

1)QA AND QC IN INTERVENTIONAL RADIOLOGY
DUE TO THE SPECIFIC UTILISATION OF THE RADIOLOGICAL EQUIPMENT IN INTERVENTIONAL RADIOLOGY, THE CONCERTED CHOICE OF PARAMETERS

TO BE MONITORED AND THE EXISTENCE OF WELL ADAPTED QUALITY CONTROL PROTOCOLS ARE FUNDAMENTAL TO THE QUALITY SYSTEM. THE OBJECTIVE OF THIS PART OF THE PROJECT IS THEREFORE TO IDENTIFY THE PARAMETERS WHICH CONTROL IMAGE QUALITY AND PATIENT DOSE AND TO DEVELOP METHODS FOR THEIR OPTIMISATION AND MONITORING.
2) OCCUPATIONAL AND PATIENT DOSE ASSESSMENT.
RECENT INTERNATIONAL PUBLICATIONS HAVE CLEARLY ADRESSED THE PROBLEM OF WELL TRAINING AND ADEQUATELY MONITORING ALL PERSONAL TAKING PART IN INTERVENTIONAL RADIOLOGY PROCEDURES. THE OCCUPATIONAL EXPOSURE RELATED TO CERTAIN TYPES OF EXAMINATIONS MAY SIGNIFICANTLY VARY DEPENDING ON THE TECHNICAL CHARACTERISTICS OF RADIOLOGICAL EQUIPMENT USED AND THE POSITIONNING OF THE OPERATING STAFF. RATHER HIGH LEVEL OF SUPERFICIAL ORGANS DOSE AND/OR WHOLE BODY DOSE MAY THEREFORE BE MONITORED AND RADIATION PROTECTION OPTIONS SHOULD BE DESIGNED TO KEEP INDIVIDUAL EXPOSURE AT THE ALARA LEVEL. INTERVENTIONAL RADIOLOGY PRACTICE IN GREECE: QUALITY ASSURANCE,TYPE AND FREQUENCY OF EXAMINATIONS EFFECTIVE DOSE OF PATIENT AND STAFF

The modern methods of interventional radiology make them methods of choice in an increasing number of cases(angioplasty,embolisation,investigation of GIT,broncho - pulmonary system etc). A steady increase in both the total number of interventional radiological units and in the diversity of types of machines has been noted in Greece. However,there is a considerable exposure of patient and staff which in some cases may exceed the acceptable
dose limits. on the other hand the radiation exposure due to interventional radiology practice has not been evaluated in terms of:
- quality control of the radiological equipment
- type and frequency of examinations performed
- technical parameters used
A quality control program will estimate the quality of radiation and the type of machines used. Informations on the technique utilized as well as the type and frequency of examinations performed can evaluate the radiation exposure of patient and staff. In a number of Greek hospitals,chosen at random,individual patient and staff dose will be measured using TLD - dosimeters. Comprehensive assessment of the risk requires the knowledge of the effective dose to all the radiosensitive organs of the patient and staff. The effective dose(collective and that in critical organs)will be calculated according to the recent ICRP publication - 60. The somatic and hereditary risks of the Greek population due to interventional radiology practice will subsequently be appraised. Comparison of the overall provision for interventional radiology in Greece with that for the other participating countries will be made. The common European protocol of measurements of France Italy,Spain,Germany and

Greece under the guidance of project coordinator ensures the optimisation of patient and staff dose conforming with the ALARA principle. A sound basis for training of all staff groups involved in radiation protection of the patient - according to Council Directive 84/866 Euratom -will be established.

Fields of science (EuroSciVoc)

medical and health sciences > clinical medicine > **angiology**

medical and health sciences > clinical medicine > **radiology**

medical and health sciences > clinical medicine > **cardiology**

Programme(s)

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Call for proposal

Data not available

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Coordinator

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No data

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EU contribution

No data

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Regione Friuli Venezia-Giulia

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EU contribution

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