

PATIENT DOSE IN INTERVENTIONAL RADIOLOGY. A EUROPEAN SURVEY

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Samples of patient doses for a few common fluoroscopy guided, both diagnostic and therapeutic procedures in interventional radiology (other than cardiological radiology), were collected by a detailed questionnaire sent to a few radiological departments in 13 European countries. The purpose was to compare practices between different European Centers, to evaluate the variability of patient doses and the need for optimization, and to provide data for a set of reference levels. The main data included total DAP, fluoroscopy time, number of series and number of images. The dosimetric characteristics (entrance dose rate and dose per image) of the associated x-ray systems were also recorded. For each type of procedure in a given hospital, data for at least ten patients was requested yielding all together data for about 1500 patients. However, the most common interventional procedures in the participating hospitals varied greatly and the direct comparison of results for a given type of procedure was possible only for a few procedures. For some of the procedures, the results indicated large variation of total DAP and fluoroscopy time between hospitals (for example, for lower limb arteriography and carotid angiography the differences were up to about fivefold). At a given hospital, the variation of total DAP from patient to patient was also very high (standard deviation 20...130 %). Further, the variation of the ratio total DAP/fluoroscopy time between hospitals was at maximum from fivefold to tenfold, suggesting considerable differences in the field size or other parameters of the practices. The entrance dose rate for the associated x-ray systems varied by a factor of 6 to 14 (within a given dose rate setting) and this can explain part of the differences in patient doses. However, there was not systematic correlation between the entrance dose rate and the patient dose, indicating that there are also other parameters influencing the dose. The data obtained indicates typical levels of patient doses and their variation but is not sufficient for setting reference levels for Europe. The results also suggest that there is a need to optimize the procedures. Therefore, more work on the optimization followed by collection of more data on patient doses, with better definitions of the procedures to improve the comparability of results, is needed in order to be able to set European reference levels.