

Resolution of Public Consultation Comments for

ICRP Publication 160: Practical Aspects in Optimisation of Radiological Protection in Digital Radiography, Fluoroscopy, and CT

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Background

ICRP is grateful for the time and effort taken to review and comment on the draft report during the public consultation period. Such consultations are a valuable part of developing high-quality publications and many useful points were made and additional references proposed.

Public Consultation

The draft report was available for public consultation for five months, ending on 31 March 2023. Responses were received on behalf of 12 organisations and nine individuals with over five hundred individual comments.

The revised report was approved for publication by the Main Commission in March 2024, with agreement on some final revisions.

Resolution of Comments

The many constructive comments received during public consultation are gratefully acknowledged. Comments were generally supportive of the content and scope of the report. Every individual comment was considered and taken into account wherever practicable, and a list of all the responses was prepared and discussed by the Task Group (TG), during the review process. The feedback has helped the authors to develop the report, which has been revised throughout, including proposals for improvement in methodologies. A number of additional references supplied in the comments have been included. Differences in approaches, organisational arrangements and staff roles in different countries around the globe have been highlighted by a number of organisations. Different viewpoints have been carefully considered in developing a document that does not exclude practices that are working successfully, but aims to provide assistance to a wide range of radiology facilities in improving arrangements for optimisation.

The contribution from medical physicists is seen as an important component in developing optimisation programmes. The appointment of diagnostic radiology medical physicists to work with radiologists and radiographers in optimisation teams is seen as an important step forward. This brings in scientific expertise into ensuring that new technologies on x-ray equipment that provide facilities for dose reduction are utilised properly. Medical physicists can also support research and development into improved methodologies for evaluation of image quality and reduction of patient doses that are needed to take optimisation of digital radiology techniques forward. However, it is appreciated that this is at present difficult in many countries, because of the limited availability of appropriately trained medical physicists and established practices based around the other radiation disciplines.

The form of having guidelines that move through a series of stages from D when an x-ray facility is set up through C Basic, to B Intermediate to A Advanced, and linking this to arrangements, equipment and techniques that should be in place to fulfil requirements at the various stages has been favourably received. Many of the comments related to the value of listing factors in tables or bulleted lists for easy reference and the authors have tried to follow this approach in order to provide a practical document that can be easily accessed. This approach has also been adopted in listing arrangements that might be expected to be in place at the different levels.

There were comments from several organisations about terminology for use in describing clinicians other than radiologists who perform interventional procedures, as in responses to the consultation on the first report on Optimisation that has recently been published. The TG have adopted the term *radiological medical practitioner* as used in the IAEA Basic Safety Standard to apply to all medical staff performing a medical practitioner role, including radiologists. The provision of appropriate education and training in the medical uses of radiation is especially important for all members of this group. Comments that in some countries health professionals other than radiological medical practitioners may be trained to interpret images for specific applications were also acknowledged.

The report included dedicated sections on individual x-ray modalities. Comments received on Section 2: Radiography, included discussions of exposure factors, dose levels, digital detector sensitivities, use of the exposure index, grids, reject analysis and contact shielding. Comments on Section 3: Fluoroscopy and Interventional, included protocol selection and avoidance of skin injuries. Comments on Section 4: Computed Tomography (CT) dealt with use of the scan projection radiograph in setting up automatic tube current modulation, the need for wider availability of CT protocols, and the potential impact of artificial intelligence. All were given due consideration, the text improved based on discussions among TG members and efforts made to include more information. It is acknowledged that changes in many areas are likely to occur during the lifespan of this document, but cannot be predicted. Section 5 on Paediatric Procedures received extensive comments as this is seen as an important area needing specific attention because of difficulties arising from greater radiosensitivity, patient size, and differences in approach needed when dealing with children. With reference to Section 6: Pregnant patients, points were made about when it was appropriate to determine pregnancy status and questioning of patients.

Annex: Consultation respondents

Responses were received from a range of international and national professional organisations representing radiographers, radiologists and medical physicists. These included the International Society of Radiographers and Radiological Technologists, European Federation of Radiographer Societies, European Federation of Organisations for Medical Physics, Federal Office of Radiation Protection Germany, Australian Radiation Protection and Nuclear Safety Agency, Dutch Association of Medical Physics, Image Gently Alliance, AsiaSafe, UK Society for Radiological Protection, UK Society of Radiographers, Chinese Society of Medical Physics, Hull University Teaching Hospitals, and the following individuals: Shane Foley, John Kotre, Chinedu Okologbu, Andrea Pimenta, Mike Moores, Andrea Magistrelli, Flavious Bobuin Nkubli, Matteo Migliorini and Riochard Carter.