

Task Group 108: Optimisation of Radiological Protection in Digital Radiography, Fluoroscopy, and CT in Medical Imaging

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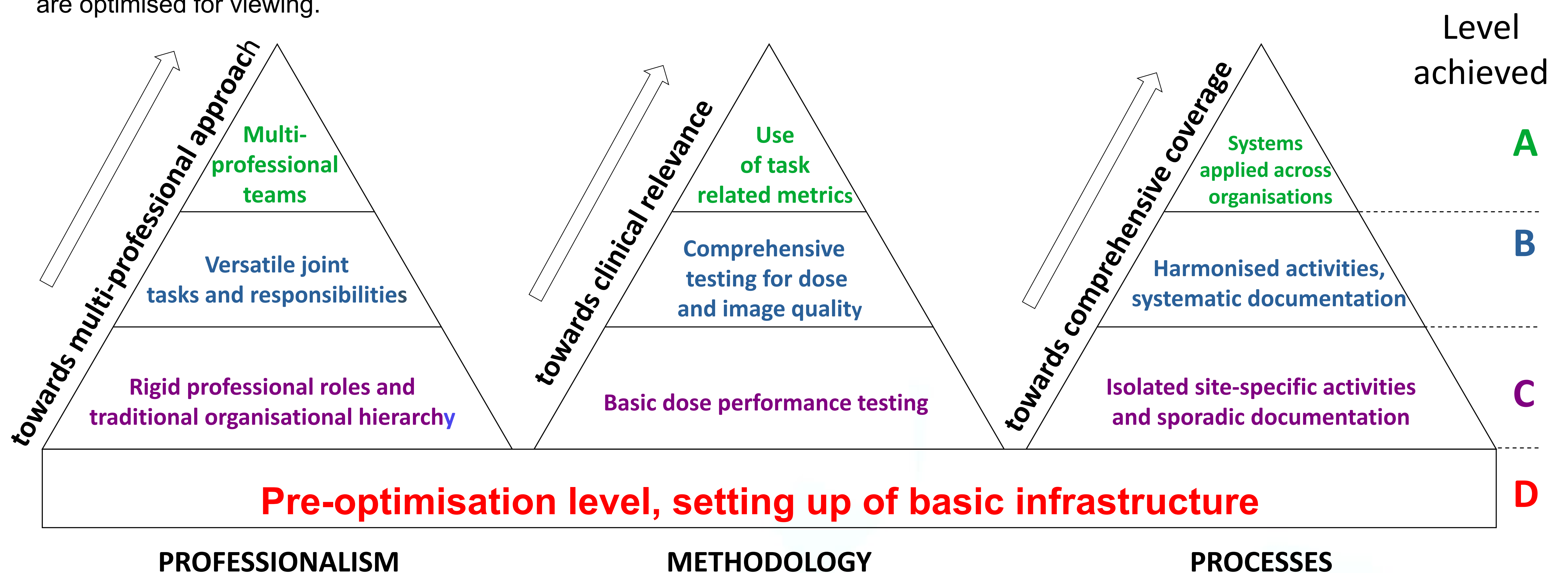
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Digital imaging presents challenges particularly when it is introduced into centres with more limited facilities and expertise. X-ray units are more complex and dose levels for imaging can be unreasonably high without users realising, because greyscale images are optimised for viewing.

The majority of radiology facilities around the world do not have the necessary tools and technical infrastructure, nor the availability of multi-professional expertise to fully embrace optimisation. What is important for improvement in any hospital depends on the available tools and expertise. Therefore the actions required will vary and provision of advice on the appropriate optimisation steps needs to be tailored to the requirements both of each region and each centre.

The stage in the optimisation process depends on the systems already in place and the level of expertise of staff. The development stages can be described in terms of three aspects that can be described as:

- 1) Professional skills, collaboration and management
 - 2) Methodology and technology
 - 3) Organisational processes and documentation.
- Development stages (C, B, and A) are illustrated below.



Report contents

1. Introduction
2. The optimisation process and application to centres of differing expertise
3. Patient dose audit
4. Evaluation of image quality
5. Digital radiography
6. Interventional and other fluoroscopic procedures
7. Computed tomography
8. Paediatric procedures
9. Examinations of pregnant patients
10. Training of clinical staff in optimisation methods and the team approach
11. Summary

Annex A Dose quantities and units

Annex B Links between displayed parameters and individual patient organ doses or effective

Annex C Descriptors of image quality

Annex D Automated exposure information reporting systems

Annex E Artefacts

Aims and summary

The table of contents for the report is shown left. An aim to is to provide more exploration of image quality requirements for diagnostic tasks, as this is an essential part of the optimisation process. Chapters will be included on the major x-ray imaging modalities, setting out the requirements needed to understand the operation of x-ray equipment that continues to become more sophisticated and complex. Application of new facilities means that lower doses can potentially be achieved, but if users do not understand the interplay of different factors this can lead to an increase in dose rather than a decrease.

Radiology centres are encouraged to set up optimisation teams comprising radiographers, radiologists, and medical physicists with the aim of reviewing and optimising clinical protocols for each modality. This will require training of multidisciplinary groups of local professionals in optimisation requirements, which might be through visits to international centres. National surveys of patient doses, initially for CT and radiography, can highlight broad needs for optimisation, and may also be used in establishing DRLs for identifying facilities to target where optimisation is required. Specialist national teams might visit centres to optimise protocols throughout a country, especially CT.