MS13: Finalisation of clinical indications for diagnostic CT DRLs

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1. Task 5.1 - Identification of clinical indications

This task aims to identify the clinical indications with the highest priority for diagnostic reference levels (DRLs) for paediatric patients, adolescents, and young adults. The selection of clinical indications will be guided by the following criteria: (a) significance from a radiation protection perspective, (b) coverage of multiple anatomical areas, and (c) clear and unambiguous naming of the clinical indications. The final list of clinical indications was determined by consensus among the experts participating in this task.

Based on the consensus discussion the following clinical indications were selected:

Clinical indications for DRLs in children and young adults			
Anatomical region	Clinical indication	IV contrast?	Comment
Head	Trauma	Non-contrast	Can include facial bones
Mastoid bone/Inner ear	Hearing loss; congenital malformations, infection, cholesteatoma, cochlear implants	Non-contrast	
Chest	Complicated infection	Contrast-enhanced (single phase)	
Chest	Fungal infection	Non-contrast	
Chest	HRCT - Interstitial lung diseases, small airways disease, cystic fibrosis, asthma, primary ciliary dyskinesia, chronic lung disease of prematurity, …	Non-contrast	Inspiration/Expiration
Abdomen	Acute abdomen (non-trauma)	Contrast enhanced (Portal-venous phase)	E.g. (complicated) appendicitis, pancreatitis, peritonitis/abscesses, bowel perforation...
Chest-Abdomen	Tumor staging & follow-up	Contrast-enhanced (single phase)	No liver tumors
Neck-Chest-Abdomen	Lymphoma staging & follow-up	Contrast-enhanced (single phase)	

The rationale behind the selection of these clinical indications is that CT is still most frequently used for these indications in children and young adults, in particular in general hospitals, and low and middle

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income countries where access to MRI is limited. The variability of radiation doses across hospitals for the selected clinical indications is expected to be wide, with as a consequence the potential of significant dose reduction through optimization of paediatric specific acquisition protocols including establishment of DRLs. For paediatric acute abdominal indications, multi-phase acquisitions (arterial, delayed, or non-contrast) are not recommended and should not be included in a DRL survey, as they increase the radiation dose without additional diagnostic benefit. This also applies to tumour staging and follow-up of most solid tumours and all lymphoma subtypes. For head trauma, we decided to include the non-contrast acquisition only. The most important arguments for this are that we expect that the contrast-enhanced head CT for trauma will show a wide variability in protocols and anatomic regions included, ranging from head only or head & neck coverage up to total body coverage scanned in one volume.

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