Paediatric - craniofacial malformations

Preparatory steps

Indication	Severe malformation of the head and face
Advisable preliminary or alternative investigations	Skull radiographs; AP and lateral
Patient preparation	Appropriate patient consent. Radiodense items (tubes) should be excluded wherever possible. Correct positioning of the head of the patient must be pursued. Sedation or general anaesthesia may be required.
Scan projection radiograph	Lateral: head including the whole mandible

Acquisition objectives

Target volume	Whole head and cervical spine.
Image weighting	Spatial resolution is dominant
Exposure	Should be adjusted to head size; keep low in infants.
Beam collimation	4 slice small - medium (< 1 mm; 1 - 2.5 mm); 16 slice small - medium (< 1 mm; 1 - 2.5 mm)
Pitch	Medium (0.9 - 1.3)
CTDI volume	According to patient size (low to medium)
Tube voltage	Low - medium (according to patient size) (< 110 kV; 110 – 130 kV)

Image reconstruction

Viewing slice thickness defines radiation parameters. MPR and 3D volume rendering is mandatory

Primary reconstruction section thickness	Adapted to beam collimation
Overlap of primary reconstruction	30%
Reconstruction algorithm	Soft tissue standard & high resolution
Field of view	Corresponding to the head and face
Viewing slice thickness	Medium
Overlap of viewing slices	0-30%

Paediatric - craniofacial malformations

Image quality criteria, visualization	1. Entire head 2. Entire face 3. Entire mandible 4. Brain
Image quality criteria, critical reproduction	1. Sharp reproduction of all cranial sutures 2. Sharp reproduction of skull bones 3. Sharp reproduction of ethmoid and mastoid air cells
Contrast media	None
Modification to technique	Additional slices may be reconstructed to evaluate osseous structures of the petrous bones and to evaluate the brain with appropriate algorithm

Paediatric - chest general

Preparatory steps

Indication	Mediastinal masses, trauma, suspected tracheobronchial anomalies; severe inflammatory bronchopulmonary and pleural disease
Advisable preliminary or alternative investigations	Chest radiographs; ultrasonography in selected cases MRI is an alternative method.
Patient preparation	Appropriate patient consent. Radiodense items should be excluded wherever possible. Correct positioning of the patient must be pursued. Sedation or general anaesthesia may be required (especially for breath-holding)
Scan projection radiograph	Frontal: from tip of the mandible to upper abdomen

Acquisition objectives

Target volume	From the lung apices to the posterior costo-phrenic recesses.
Image weighting	Contrast resolution and spatial resolution
Exposure	Low - Medium. Should be adjusted to patient size.
Beam collimation	4 slice small - medium (< 1 mm; 1 - 2.5 mm); 16 slice small - medium (< 1 mm; 1 - 2.5 mm)
Pitch	Medium (0.9 - 1.3)
CTDI volume	According to patient size (low to medium)
Tube voltage	Low - medium (according to patient size) (< 110 kV; 110 – 130 kV)

Image reconstruction

Image reconstruction	Viewing slice thickness defines radiation parameters. MPR is recommended; for tracheobraonchial and vascular anomalies 3D viewing is recommended
Primary reconstruction section thickness	Adapted to beam collimation
Overlap of primary reconstruction	0-50%
Reconstruction algorithm	Soft tissue standard & high resolution
Field of view	Corresponding to the chest
Viewing slice thickness	Medium (soft tissue) & small (lung)
Overlap of viewing slices	0-30%

Paediatric - chest general

Image quality criteria, visualization	1. Entire chest content 2. Entire chest wall
Image quality criteria, critical reproduction	1. Sharp reproduction of air-soft tissue interface of the trachea and major bronchi 2. Sharp reproduction of mediastinal and hilar vessels 3. Sharp reproduction of the lower lobe vessels of the lungs 4. Sharp reproduction the heart cavities
Contrast media	Mandatory for most indications
Dose and concentration	Dependent on age and weight (see chapter 5); non ionic contrast media
Flow rate	1.5 – 3 ml/ s; preferably by power injector
Delay and timing	Dependent on age and indication
Modification to technique	Target area of interest may belimited in selected cases according to the clinical indication. In selected cases target volume may be extendedto include other areas of suspected disease (especially the neck)

Paediatric - abdomen survey

Preparatory steps	
Indication	Trauma, suspected intra-/retroperitoneal abscess. Diagnosis of masses, staging and monitoring of neoplasms
Advisable preliminary or alternative investigations	Ultrasonography; MRT is the preferred method in most patients
Patient preparation	Appropriate patient consent. Radiodense items should be excluded wherever possible. Appropriate bowel opacification is recommended. Correct positioning of the patient must be pursued. Sedation or general anaesthesia may be required.
Scan projection radiograph	Frontal: mid chest to upper thigh
Acquisition objectives	
Target volume	From diaphragm to the symphysis
Image weighting	Contrast resolution is dominant
Exposure	Should be adjusted to patient size.
Beam collimation	4 slice medium - large (1 - 2.5 mm; > 2.5 mm); 16 slice medium (1 - 2.5 mm)
Pitch	Medium (0.9 - 1.3)
CTDI volume	According to patient size (low to medium)
Tube voltage	Low - medium (according to patient size) (< 110 kV; 110 – 130 kV)
Image reconstruction	Viewing slice thickness defines radiation parameters. MPR is recommended.
Primary reconstruction section thickness	Adapted to beam collimation
Overlap of primary reconstruction	0-50%
Reconstruction algorithm	Soft tissue standard
Field of view	Corresponding to the abdominal region
Viewing slice thickness	Medium
Overlap of viewing slices	0-30%

Paediatric - abdomen survey

Image quality criteria, visualization	1. Entire abdominal contents 2. Both entire diaphragms 3. Entire bladder 4. Abdominal wall
Image quality criteria, critical reproduction	1. Sharp reproduction of major branches of the abdominal aorta 2. Sharp reproduction of renal pelvis and part of the ureters (enhanced scans) 3. Reproduction of the gall bladder wall (enhanced scans) 4. Reproduction of the intrapancreatic part of the common bile duct (enhancd scans) 5. Reproduction of urinary bladder wall (enhanced scans) 6. Reproduction of intrahepatic vessels (enhanced scans)
Contrast media	Mandatory
Dose and concentration	Dependent on age and weight (see chapter 5); non ionic contrast media
Flow rate	1.5 – 3 ml/ s; preferably by power injector
Delay and timing	Dependent on age and indication
Modification to technique	In suspected abdominal hemorrhage, oral contrast media must be avoided. Target area of interest may be limited in selected cases according to clinical indication.