

## **Pediatric CT Protocols (18 years old or less)**

Ped1: Head CT

Ped2: Cervical spine CT

Ped3: Sinus CT

Ped4: Neck CT

Ped5: Chest CT

Ped6: Abdomen and pelvis CT

Ped7: Thoracic or lumbar spine CT

Ped8: Extremity CT

## **Ped 1: Head CT (without contrast, or with contrast)**

Indications: trauma, headaches, mass.

Contrast parameters	Optional: 1 mL/lb (up to 100 lb), at 2.5 mL/sec
Region of scan	Foramen magnum to vertex, angled to exclude orbits.
Scan delay	If using IV contrast: 60 sec
Detector collimation	Non-helical 16 x 1.5 mm OR helical 64 x 1.2 mm, 32 x 1.2 mm (128 slice)
Slice thickness	4.5 mm OR (helical) 5 mm thick axial reformats. 4 mm OR (helical) 5mm (128 slice)
Filming	1) H30s kernel (axials) and H70s kernels 2) H30s kernel (axials)

### Comments:

- Eye shields if able to tolerate.
- Pediatric dose adjustments:
  - 0-23 months: kV 100, mA 300, mAs 120.
  - 2-6 years: kV 120, mA 310, mAs 124.
  - 7-14 years: kV 120, mA 310, mAs 155.
  - >15 years: kV 120, mA 335, mAs 165.

## **Ped 2: Cervical spine CT without contrast**

Indications: trauma.

Contrast parameters	None
Region of scan	Foramen magnum to bottom of T4
Scan delay	NA
Detector collimation	16 x 0.75 mm, 64 x 0.6 mm, 128 x 0.6 mm
Slice thickness	3.0 mm axials, 2.0 mm sagittal and coronal MPR
Filming	B20s, B70s kernels

Comments:

- Thyroid shields should not be placed on C-spine collars.
- Pediatric dose adjustment: 100 kVp; variable mAs via CareDose.
- Siemens C-SpineVol package.
- Field of view: 12-13 cm.
- Trauma criteria: *AJR* 2000; 174:713-717
  - Injury mechanism: high-speed (>35 mph combined) MVA, MVA with death at scene, fall >10 feet.
  - Clinical evaluation: known closed head injury, pelvic or multiple extremity fx, neurologic Sx or C-spine radiculopathy.

### **Ped 3: Sinus CT without contrast**

Indications: sinusitis.

Contrast parameters	None
Region of scan	Frontal sinus to floor of maxillary sinus; patient supine.
Scan delay	NA
Detector collimation	16 x 0.75 mm, 64 x 0.6 mm, 128 x 0.6 mm direct axials
Slice thickness	3.0 axials, 3.0 mm coronal and sagittal reformats.
Filming	H70f kernel

Comments:

- Pediatric dose adjustment: 100 kVp; variable mAs via CareDose.
- Eye and thyroid shields if able to tolerate.

## **Ped 4: Soft tissue neck CT (with contrast, or without contrast)**

Indications: neck masses, infection and abscesses, soft tissue trauma.

Contrast parameters	If using IV contrast: 1 mL/lb up to 125 lbs @ 2.5 mL/sec.
Region of scan	1) Sella to aortic arch 2) Pharynx (angled axials)
Scan delay	(if using IV contrast) 40 sec
Detector collimation	16 x 0.75 mm, 64 x 0.6 mm, 128 x 0.6 mm
Slice thickness	3.0 mm axials and oblique axials; 3.0 mm thick coronal reformats
Filming	B31s kernel

### Comments:

- Pediatric dose adjustment: 100 kVp; variable mAs through CareDose.
- Use thyroid shield.
- Siemens NeckVol package.
- If concomitant trauma C-spine evaluation needed, perform additional 3 mm axials, 2mm sagittal and coronal MPR as specified in protocol Sp1, and merge with current study.

## **Ped 5: Chest CT (without contrast, or with contrast)**

Indications: lung, mediastinal and pleural pathology.

Contrast parameters	If using IV contrast: 1 mL/lb up to 125lb @ 2.5mL/sec.
Region of scan	Lung apex to posterior costophrenic angles
Scan delay	If using IV contrast: 50 seconds
Detector collimation	16 x 0.75 mm, 64 x 0.6 mm, 128 x 0.6 mm
Slice thickness	5 mm axials, 7 mm coronal & sagittal MIP reformats If younger than 10 years: 3 mm axials instead.
Filming	B30f kernel (axials) B70f kernel (axials, coronal MIP)

### Comments:

- Pediatric dose adjustment: use CareDose.
  - Weight < 9 kg: 80 kVp.
  - Weight 10-25 kg: 100 kVp.
  - Weight 26 kg or more:
    - 100 kVp for BMI < 30.
    - 120 kVp for BMI > 30.
- Use breast shields for females.

## **Ped 6: Abdomen and pelvis CT (with contrast, or without contrast)**

Indications: abdominal pain, acute abdomen, abdomen trauma.

Contrast parameters	If using oral: variable volume (see below notes). If using IV contrast: 1 mL/lb up to 125 lb @ 2.5 mL/sec
Region of scan	Diaphragm to symphysis
Scan delay	If using oral: 90 minutes from initial ingestion; 120 min for patients 10 years and younger If using IV contrast: 60 seconds
Detector collimation	16 x 1.5 mm, 64 x 1.2 mm, 32 x 1.2 mm (128 slice)
Slice thickness	5 mm axials; 5 mm coronal & sagittal reformats. If younger than 10 years: 3 mm axials, coronals and sagittals.
Filming	B30f kernel B70f kernel for lung bases.

### Comments:

- Pediatric dose adjustment: use CareDose.
  - Weight < 9 kg: 80 kVp.
  - Weight 10-25 kg: 100 kVp.
  - Weight 26 kg or more:
    - 100 kVp for BMI < 25.
    - 120 kVp for BMI > 25.
- Oral contrast by age/weight: Omnipaque, Gastrografin, or barium:
  - Less than 1 year old: 200 mL; 50 mL just before scan.
  - 9-18 kg: 400 mL; 50 mL just before scan.
  - 18-36 kg: 600 mL; 100 mL just before scan.
  - > 36 kg: 900 mL; 100 mL just before scan (same as adults).
- Use breast shields for females.
- Siemens AbdomenVol settings.
- Use 5% Gastrografin solution when there is possible bowel perforation, impending surgery, or suspected bowel obstruction.

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- Inguinal/ventral hernia evaluation: patients should perform Valsalva maneuver at end-inspiration to accentuate any hernias.



## **Ped 7: Thoracic or lumbar spine CT without contrast**

Indications: trauma, bone lesions.

Contrast parameters	None
Region of scan	Thoracic spine levels TBD by radiologist. T12 to S1 for lumbar spine scans.
Scan delay	NA
Detector collimation	16 x 0.75 mm, 64 x 0.6 mm, 128 x 0.6 mm
Slice thickness	3.0 mm axials, 3.0 mm sagittal and coronal MPR
Filming	B20s, B70s kernels

### Comments:

- Pediatric dose adjustment: 120 kVp; variable mAs through CareDose.
- Use breast shields in female thoracic spine CT's.
- Siemens SpineVol package.
- Oblique axial scan plane, to best parallel the discs as a whole.

## **Ped 8: Extremity CT without contrast**

Indications: fractures, hindfoot coalition, bone lesions.

Contrast parameters	None
Region of scan	Varies according to region of interest.
Scan delay	NA
Detector collimation	16 x 0.75 mm, 16 x 0.6 mm (64 and 128 slice)
Slice thickness	2 mm axials, 2 mm coronal and sagittal reformats
Filming	U90u kernels

### Comments:

- Pediatric dose adjustment: use CareDose.
  - Weight 25 kg or less: 100 kVp.
  - Weight 26 kg or more: 120 kVp.