

CT Urogram Split-Bolus

Updated
5/2/2024

Indications - hematuria, renal/ureteral stones/calculi, nephrolithiasis, hydronephrosis, hydroureter, chronic urinary tract infection, urothelial malignancy.

Use this protocol on anyone under 50 years of age and on those who get frequent CTs.

GENERAL SCAN NOTES

Move the patient's arms over his/her head if possible. Remove any metal from the imaging field of view.

Topogram - lung bases through pubic symphysis (obtained during end inspiration).

Craniocaudal scan coverage - lung bases through pubic symphysis on both phases (obtained during end inspiration).

Adjust FOV (field of view) on topogram to smallest without cropping anatomy.

IV Contrast:

Administer weight-based **Omnipaque-300** - **1 mL/kg** up to **150 mL** (100 mL minimum).

Inject at **2.5 mL/sec** followed by 40 mL saline flush, 20-gauge or larger in forearm or more proximal.

Oral contrast:

Give patient 32 oz water 30 mins prior to imaging.

Tell patient not to use the restroom prior to scan. The bladder needs to be distended for the best study.

Split-Bolus Technique:

Inject patient with 1/3 IV contrast dose. **DO NOT SCAN PATIENT.**

About 3 mins after IV contrast, roll the patient three times to mix contrast within bladder.

After rolling the patient, inject the remaining 2/3 IV contrast dose.

90 seconds after start of second injection **SCAN PATIENT.**

For **GE scanners**, it is essential for the 1st recon thickness on the scanner to match the 1st recon thickness in this protocol book for the prescribed Noise Index to be valid. The 1st recon should generally be the thickest recon in the protocol.

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SIEMENS PARAMETERS & RECONS

For the Pre Contrast and Split-Bolus phases:

| | Scan Mode | kV | mAs | Care Dose | Care kV & Lvl | Pitch | Acq | Coll | Rot Time | Scan Time |
|---------------|-----------|-----|-----|-----------|---------------|-------|-----|------|----------|-----------|
| Sensation 16 | spiral | 120 | 200 | on | NA | 0.80 | 16 | 1.5 | 0.5 | 13.0 |
| Go Up 32 | spiral | 130 | 92 | on | on 145 | 0.80 | 32 | 0.7 | 0.8 | 22.3 |
| Sensation 64 | spiral | 120 | 200 | on | NA | 1.20 | 24 | 1.2 | 0.5 | 7.2 |
| Definition 64 | spiral | 120 | 180 | on | on | 0.60 | 64 | 0.6 | 0.5 | 21.7 |
| Go Top 64 | spiral | 120 | 112 | on | on 145 | 0.80 | 64 | 0.6 | 0.5 | 8.1 |
| Drive 128 | spiral | 120 | 147 | on | on | 0.60 | 128 | 0.6 | 0.5 | 10.9 |
| Force 192 | spiral | 120 | 147 | on | on | 0.60 | 192 | 0.6 | 0.5 | 7.2 |

PRE CONTRAST PHASE

| Name of Series | Thick | Interval | Kernel | Window | IR Lvl | Recon Direction |
|----------------|-------|----------|-------------|-------------|--------|-----------------|
| AX PRE | 3.0 | 3.0 | Br40 / B41f | mediastinum | 3 | head/feet |
| COR PRE | 3.0 | 3.0 | Br40 / B41f | mediastinum | 3 | front/back |

POST SPLIT-BOLUS PHASE

| | | | | | | |
|----------------|-----|-----|-------------|-------------|---|------------|
| AX SPLIT | 3.0 | 3.0 | Br40 / B41f | mediastinum | 3 | head/feet |
| COR SPLIT | 3.0 | 3.0 | Br40 / B41f | mediastinum | 3 | front/back |
| SAG SPLIT | 3.0 | 3.0 | Br40 / B41f | mediastinum | 3 | left/right |
| COR SPLIT MIPS | 5.0 | 3.0 | Br40 / B41f | mediastinum | 3 | front/back |
| SAG SPLIT MIPS | 5.0 | 3.0 | Br40 / B41f | mediastinum | 3 | left/right |

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GE PARAMETERS & RECONS

For the Pre Contrast and Split-Bolus phases:

| | Scan Type | SFOV | kV | mA Range | Noise Index | Smart mA | Slice Thick | Beam Coll | Pitch | Speed | Rot Time | Dose Red | ASIR | Scan Time |
|-------------|-----------|------------|-----|----------|-------------|----------|-------------|-----------|-------|-------|----------|----------|------|-----------|
| LS 16 | helical | large | 120 | 50-440 | 16.36 | on | 2.5 | 20 | 1.375 | 27.50 | 0.6 | NA | NA | 10.9 |
| Opt 540 | helical | large | 120 | 50-440 | 16.36 | on | 2.5 | 20 | 1.375 | 27.50 | 0.6 | NA | NA | 10.9 |
| LS VCT 64 | helical | large body | 120 | 50-650 | 16.36 | on | 2.5 | 40 | 1.375 | 55.00 | 0.5 | 50 | 50 | 4.5 |
| Disc VCT 64 | helical | large body | 120 | 50-650 | 16.36 | on | 2.5 | 40 | 1.375 | 55.00 | 0.5 | NA | NA | 4.5 |

PRE CONTRAST PHASE

| Name of Series | Thickness | Interval | Recon Algorithm | Window Width/Level | Recon Direction |
|----------------|-----------|----------|-----------------|--------------------|-----------------|
| AX PRE | 2.5 | 2.5 | std full | 400/40 | head/feet |
| COR PRE | 2.5 | 2.5 | std full | 400/40 | front/back |

Must be first recon.

POST SPLIT-BOLUS PHASE

| | | | | | |
|----------------|-----|-----|----------|--------|------------|
| AX SPLIT | 2.5 | 2.5 | std full | 400/40 | head/feet |
| COR SPLIT | 2.5 | 2.5 | std full | 400/40 | front/back |
| SAG SPLIT | 2.5 | 2.5 | std full | 400/40 | left/right |
| COR SPLIT MIPS | 5.0 | 3.0 | std full | 400/40 | front/back |
| SAG SPLIT MIPS | 5.0 | 3.0 | std full | 400/40 | left/right |

Must be first recon.

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PHILIPS PARAMETERS & RECONS

For the Pre Contrast and Split-Bolus phases:

| | Scan Mode | kV | Avg mAs | Dose Index | 3D Dose | Pitch | Detect | Colli | Rot Time | Scan Time |
|--------------|-----------|-----|---------|------------|---------|-------|--------|-------|----------|-----------|
| Incisive 128 | helical | 120 | 115 | 20 | on | 1.00 | 64 | 0.625 | 0.75 | 5.6 |

PRE CONTRAST PHASE

| Name of Series | Thick | Interval | Filter | Window | iDose | Recon Direction |
|----------------|-------|----------|--------|-------------|-------|-----------------|
| AX PRE | 3.0 | 3.0 | B | mediastinum | 3 | head/feet |
| COR PRE | 3.0 | 3.0 | B | mediastinum | 3 | front/back |

POST SPLIT-BOLUS PHASE

| | | | | | | |
|----------------|-----|-----|---|-------------|---|------------|
| AX SPLIT | 3.0 | 3.0 | B | mediastinum | 3 | head/feet |
| COR SPLIT | 3.0 | 3.0 | B | mediastinum | 3 | front/back |
| SAG SPLIT | 3.0 | 3.0 | B | mediastinum | 3 | left/right |
| COR SPLIT MIPS | 5.0 | 3.0 | B | mediastinum | 3 | front/back |
| SAG SPLIT MIPS | 5.0 | 3.0 | B | mediastinum | 3 | left/right |