CT Shoulder

Updated 05/05/24
Reviewed 05/14/25

Indications - trauma, fracture, dislocation, pain, bone tumor, soft tissue mass, infection, abscess, soft tissue gas, osteomyelitis, pre/post surgical evaluation.

Bill under CT Shoulder charges.

GENERAL SCAN NOTES

Remove any metal from the imaging field of view.

Topogram - from above top of shoulder to proximal humerus.

Craniocaudal scan coverage - from above top of shoulder to proximal humerus (through prosthesis if present). Include entire ipsilateral scapula in FOV.

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

IV Contrast: 100 mL Omnipaque-300, inject at 2.5 mL/sec, 60 secs scan delay.

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.

SIEMENS PARAMETERS & RECONS

	Scan Mode	kV	mAs	Care Dose	Care kV & Lvl	Pitch	Acq	Coll	Rot Time	Scan Time
Sensation 16	spiral	120	150	on	NA	0.80	16	0.75	1.0	10.4
Go Up 32	spiral	130	84	on	on 130	0.80	32	0.7	1.0	5.6
Sensation 64	spiral	120	150	on	NA	0.90	64	0.6	1.0	5.8
Definition 64	spiral	120	165	on	on	0.80	64	0.6	1.0	6.5
Go Top 64	spiral	130	100	on	on 130	0.80	64	0.6	1.0	3.3
Drive 128	spiral	120	116	on	on	0.80	128	0.6	1.0	3.3
Force 192	spiral	120	116	on	on	0.80	192	0.6	1.0	2.2

Name of Series	Thick	Interval	Kernel	Window	IR Lvl	Recon Direction
AX BONE	3.0	3.0	Br59 / B60f	bone/osteo	3	head/feet
COR BONE	3.0	3.0	Br59 / B60f	bone/osteo	3	front/back
SAG BONE	3.0	3.0	Br59 / B60f	bone/osteo	3	left/right
AX SOFT	3.0	3.0	Br40 / B31f	abdomen	3	head/feet

Send the above recons on the pre contrast scan (if without only) or on the post contrast scan (if IV given).

Send only the following recon on the pre contrast scan (if without and with).

AX SOFT PRE	3.0	3.0	Br40 / B31f	abdomen	3	head/feet

Add the following recons for **arthrograms**:

COR SOFT	3.0	3.0	Br40 / B31f	abdomen	3	front/back
SAG SOFT	3.0	3.0	Br40 / B31f	abdomen	3	left/right

CT Shoulder

GE PARAMETERS & RECONS

	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	100-440	12.50	on	2.5	10	0.938	9.37	0.5	NA	NA	5.3
Opt 540	helical	large	120	100-440	12.50	on	2.5	10	0.938	9.37	0.5	NA	NA	5.3
LS VCT 64	helical	large body	120	100-450	16.00	on	2.5	40	0.984	39.37	0.5	20	20	1.3
Disc VCT 64	helical	large body	140	100-610	14.14	on	2.5	40	0.516	20.625	0.6	NA	NA	2.9

Name of Series	Thickness	Interval	Recon Algorithm	Window Width/Level	Recon Direction
AX BONE	**2.5**	**2.5**	**bone full**	**2500/480**	**head/feet**
COR BONE	2.5	2.5	bone full	2500/480	front/back
SAG BONE	2.5	2.5	bone full	2500/480	left/right
AX SOFT	2.5	2.5	std full	400/40	head/feet

Must be first recon.

Send the above recons on the pre contrast scan (if without only) or on the post contrast scan (if IV given).

Send only the following recon on the pre contrast scan (if without and with).

AX SOFT PRE	2.5	2.5	std full	400/40	head/feet

Add the following recons for **arthrograms**:

COR SOFT	2.5	2.5	std full	400/40	front/back
SAG SOFT	2.5	2.5	std full	400/40	left/right

PHILIPS PARAMETERS & RECONS

	Scan Mode	kV	Avg mAs	Dose Index	3D Dose	Pitch	Detect	Colli	Rot Time	Scan Time
Incisive 128	helical	120	129	22	on	0.80	64	0.625	1.00	3.1

Name of Series	Thick	Interval	Filter	Window	iDose	Recon Direction
AX BONE	3.0	3.0	YC	bone	3	head/feet
COR BONE	3.0	3.0	YC	bone	3	front/back
SAG BONE	3.0	3.0	YC	bone	3	left/right
AX SOFT	3.0	3.0	B	abdomen	3	head/feet

Send the above recons on the pre contrast scan (if without only) or on the post contrast scan (if IV given).

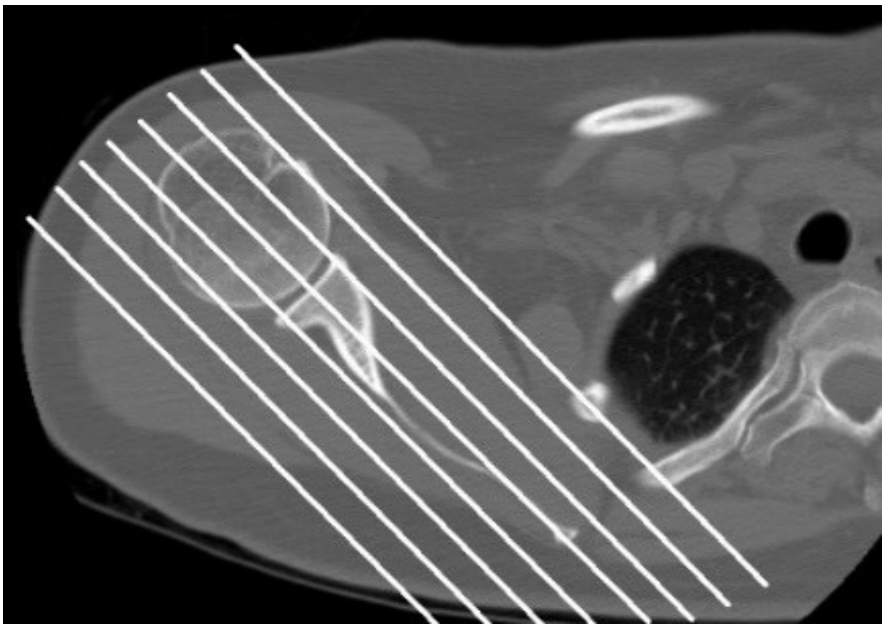
Send only the following recon on the pre contrast scan (if without and with).

AX SOFT PRE	3.0	3.0	B	abdomen	3	head/feet

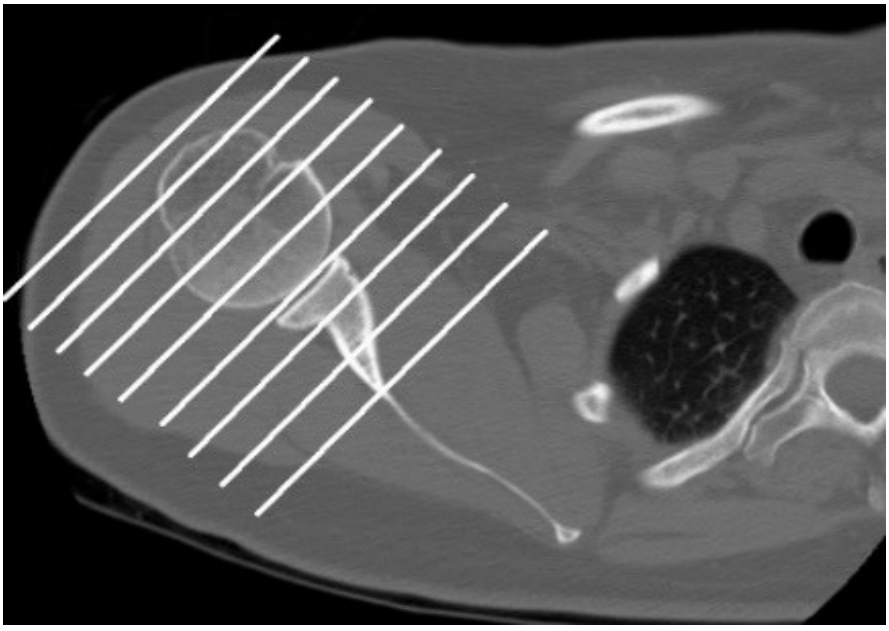
Add the following recons for **arthrograms**:

COR SOFT	3.0	3.0	B	abdomen	3	front/back
SAG SOFT	3.0	3.0	B	abdomen	3	left/right

CT Shoulder



Coronal Plane



Sagittal Plane

CT Elbow

Updated 05/05/24
Reviewed 05/15/25

Indications - trauma, fracture, dislocation, pain, bone tumor, soft tissue mass, infection, abscess, soft tissue gas, osteomyelitis, pre/post surgical evaluation.

Bill under CT Elbow charges.

GENERAL SCAN NOTES

Remove any metal from the imaging field of view.

Patient positioning:

Preferred - Patient lateral decubitus position with affected arm extended over head with palm up.

Option 2 - Patient supine head first position with arm over head.

Option 3 - Patient supine with elbow off to side of chest. Instruct patient there will be a breath hold.

Topogram - distal humerus through proximal radius and ulna.

Craniocaudal scan coverage - distal humerus through proximal radius and ulna (through prosthesis if present).

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

IV Contrast: 100 mL Omnipaque-300, inject at 2.5 mL/sec, 60 secs scan delay.

IV should be in the opposite arm.

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.

SIEMENS PARAMETERS & RECONS

	Scan Mode	kV	mAs	Care Dose	Care kV & Lvl	Pitch	Acq	Coll	Rot Time	Scan Time
Sensation 16	spiral	120	150	on	NA	0.80	16	0.75	1.0	15.6
Go Up 32	spiral	Sn 110	366	on	on 75	0.40	32	0.7	1.0	16.7
Sensation 64	spiral	120	150	on	NA	0.90	64	0.6	1.0	8.7
Definition 64	spiral	120	100	on	**off**	0.80	64	0.6	1.0	9.8
Go Top 64	spiral	Sn 100	898	on	on 75	0.40	64	0.6	1.0	9.8
Drive 128	spiral	120	70	on	**off**	0.80	128	0.6	1.0	4.9
Force 192	spiral	120	70	on	**off**	0.80	192	0.6	1.0	3.3

Name of Series	Thick	Interval	Kernel	Window	IR Lvl	Recon Direction
AX BONE	2.0	2.0	Br59 / B60f	bone/osteo	3	head/feet
COR BONE	2.0	2.0	Br59 / B60f	bone/osteo	3	front/back
SAG BONE	2.0	2.0	Br59 / B60f	bone/osteo	3	left/right
AX SOFT	2.0	2.0	Br40 / B31f	abdomen	3	head/feet

Send the above recons on the pre contrast scan (if without only) or on the post contrast scan (if IV given).

Send only the following recon on the pre contrast scan (if without and with).

AX SOFT PRE	2.0	2.0	Br40 / B31f	abdomen	3	head/feet

CT Elbow

GE PARAMETERS & RECONS

	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	100-440	17.68	on	1.25	10	0.938	9.37	0.5	NA	NA	8.0
Opt 540	helical	large	120	100-440	17.68	on	1.25	10	0.938	9.37	0.5	NA	NA	8.0
LS VCT 64	helical	large body	120	100-450	22.63	on	1.25	40	0.984	39.37	0.5	20	20	1.9
Disc VCT 64	helical	large body	120	100-450	22.63	on	1.25	40	0.984	39.37	0.5	NA	NA	1.9

Name of Series	Thickness	Interval	Recon Algorithm	Window Width/Level	Recon Direction
AX BONE	**1.25**	**1.25**	**bone full**	**2500/480**	**head/feet**
COR BONE	1.25	1.25	bone full	2500/480	front/back
SAG BONE	1.25	1.25	bone full	2500/480	left/right
AX SOFT	1.25	1.25	std full	400/40	head/feet

Must be first recon.

Send the above recons on the pre contrast scan (if without only) or on the post contrast scan (if IV given).

Send only the following recon on the pre contrast scan (if without and with).

AX SOFT PRE	1.25	1.25	std full	400/40	head/feet

PHILIPS PARAMETERS & RECONS

	Scan Mode	kV	Avg mAs	Dose Index	3D Dose	Pitch	Detect	Colli	Rot Time	Scan Time
Incisive 128	helical	120	129	22	on	0.80	64	0.625	1.00	4.7

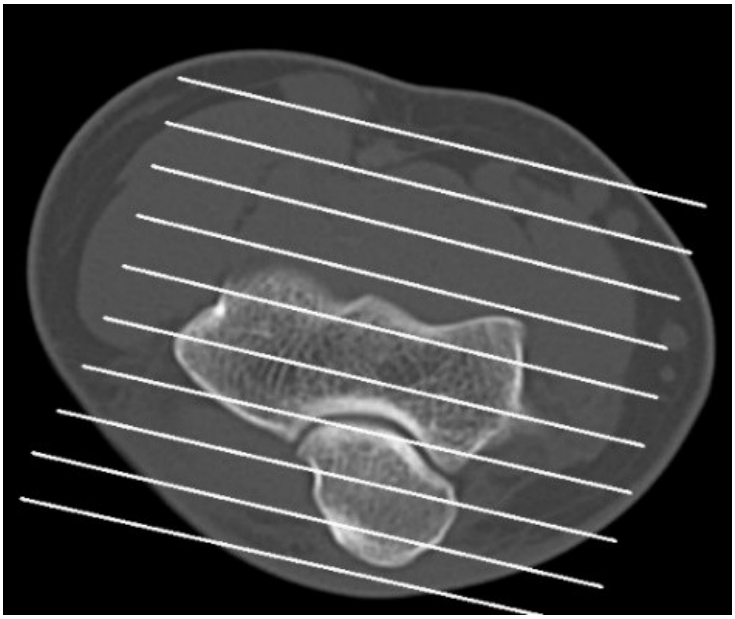
Name of Series	Thick	Interval	Filter	Window	iDose	Recon Direction
AX BONE	2.0	2.0	YC	bone	3	head/feet
COR BONE	2.0	2.0	YC	bone	3	front/back
SAG BONE	2.0	2.0	YC	bone	3	left/right
AX SOFT	2.0	2.0	B	abdomen	3	head/feet

Send the above recons on the pre contrast scan (if without only) or on the post contrast scan (if IV given).

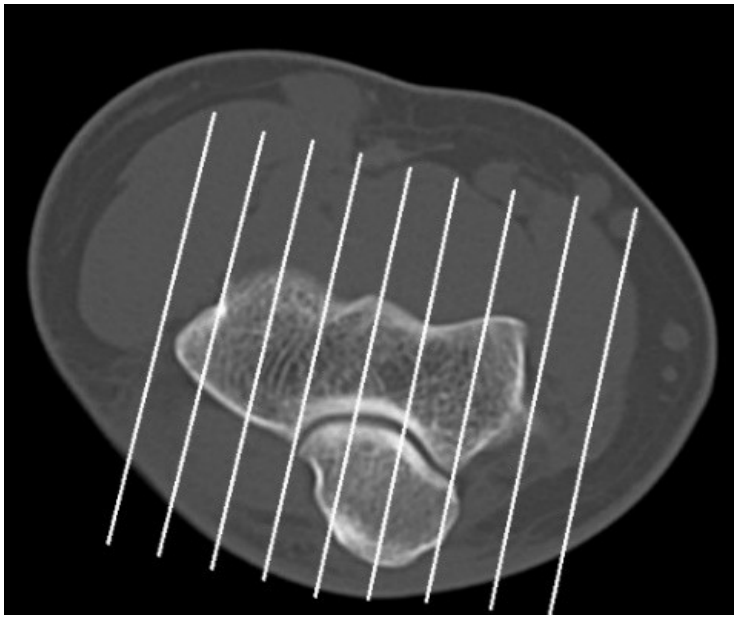
Send only the following recon on the pre contrast scan (if without and with).

AX SOFT PRE	2.0	2.0	B	abdomen	3	head/feet

CT Elbow



Coronal Plane



Sagittal Plane

CT Wrist

Updated 05/05/24
Reviewed 05/15/25

Indications - trauma, fracture, dislocation, pain, bone tumor, soft tissue mass, infection, abscess, soft tissue gas, osteomyelitis, pre/post surgical evaluation.

Bill under CT Wrist charges.

GENERAL SCAN NOTES

Remove any metal from the imaging field of view.

Patient positioning:

Preferred - Patient prone with arm over head in center of scanner, palm down with fingers straight and close together.

Option 1 - Patient lateral decubitus position with affected arm extended over head with palm up.

Topogram - base of the metacarpals through distal radioulnar joint.

Craniocaudal scan coverage - base of the metacarpals through distal radioulnar joint.

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

IV Contrast: 100 mL Omnipaque-300, inject at 2.5 mL/sec, 60 secs scan delay.

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.

SIEMENS PARAMETERS & RECONS

	Scan Mode	kV	mAs	Care Dose	Care kV & Lvl	Pitch	Acq	Coll	Rot Time	Scan Time
Sensation 16	spiral	120	120	on	NA	0.55	16	0.75	1.0	9.1
Go Up 32	spiral	Sn 110	366	on	on 75	0.40	32	0.7	1.0	6.7
Sensation 64	spiral	120	120	on	NA	0.90	64	0.6	1.0	3.5
Definition 64	spiral	120	100	on	**off**	0.80	64	0.6	1.0	3.9
Go Top 64	spiral	Sn 100	898	on	on 75	0.40	64	0.6	1.0	3.9
Drive 128	spiral	120	70	on	**off**	0.80	128	0.6	1.0	2.0
Force 192	spiral	120	70	on	**off**	0.80	192	0.6	1.0	1.3

Name of Series	Thick	Interval	Kernel	Window	IR Lvl	Recon Direction
AX BONE	2.0	2.0	Br59 / B60f	bone/osteo	3	head/feet
COR BONE	2.0	2.0	Br59 / B60f	bone/osteo	3	front/back
SAG BONE	2.0	2.0	Br59 / B60f	bone/osteo	3	left/right
AX SOFT	2.0	2.0	Br40 / B31f	abdomen	3	head/feet

Send the above recons on the pre contrast scan (if without only) or on the post contrast scan (if IV given).

Send only the following recon on the pre contrast scan (if without and with).

AX SOFT PRE	2.0	2.0	Br40 / B31f	abdomen	3	head/feet

CT Wrist

GE PARAMETERS & RECONS

	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	100-440	17.68	on	1.25	10	0.938	9.37	0.5	NA	NA	3.2
Opt 540	helical	large	120	100-440	17.68	on	1.25	10	0.938	9.37	0.5	NA	NA	3.2
LS VCT 64	helical	large body	120	100-450	16.00	on	1.25	40	0.984	39.37	0.5	20	20	0.8
Disc VCT 64	helical	large body	120	100-450	16.00	on	1.25	40	0.984	39.37	0.5	NA	NA	0.8

Name of Series	Thickness	Interval	Recon Algorithm	Window Width/Level	Recon Direction
AX BONE	**1.25**	**1.25**	**bone full**	**2500/480**	**head/feet**
COR BONE	1.25	1.25	bone full	2500/480	front/back
SAG BONE	1.25	1.25	bone full	2500/480	left/right
AX SOFT	1.25	1.25	std full	400/40	head/feet

Must be first recon.

Send the above recons on the pre contrast scan (if without only) or on the post contrast scan (if IV given).

Send only the following recon on the pre contrast scan (if without and with).

AX SOFT PRE	1.25	1.25	std full	400/40	head/feet

PHILIPS PARAMETERS & RECONS

	Scan Mode	kV	Avg mAs	Dose Index	3D Dose	Pitch	Detect	Colli	Rot Time	Scan Time
Incisive 128	helical	120	32	20	**off**	0.80	64	0.625	1.00	1.9

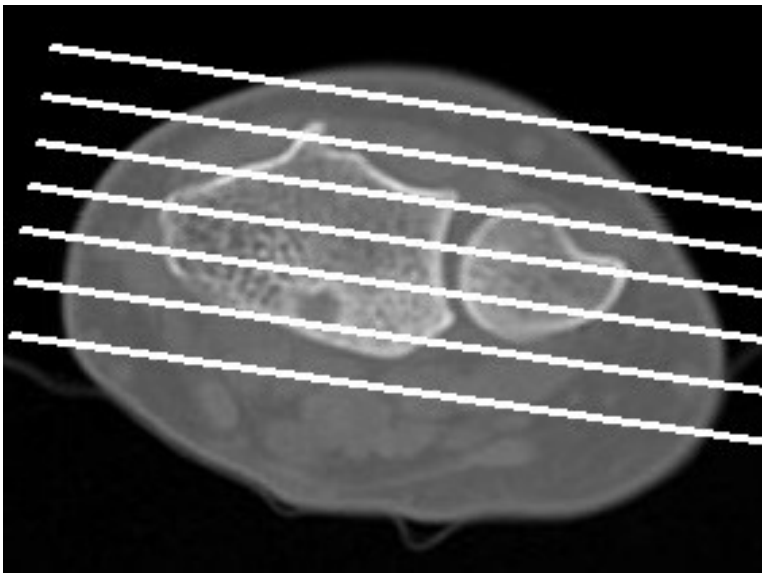
Name of Series	Thick	Interval	Filter	Window	iDose	Recon Direction
AX BONE	2.0	2.0	YC	bone	3	head/feet
COR BONE	2.0	2.0	YC	bone	3	front/back
SAG BONE	2.0	2.0	YC	bone	3	left/right
AX SOFT	2.0	2.0	B	abdomen	3	head/feet

Send the above recons on the pre contrast scan (if without only) or on the post contrast scan (if IV given).

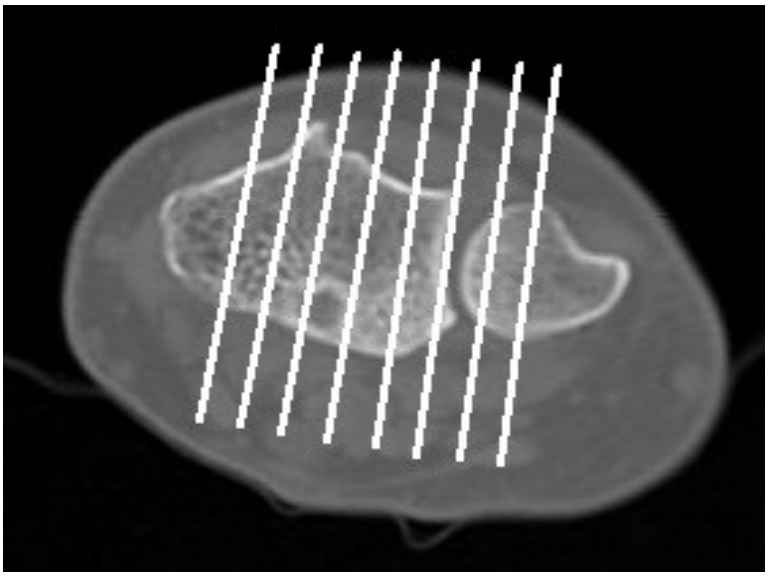
Send only the following recon on the pre contrast scan (if without and with).

AX SOFT PRE	2.0	2.0	B	abdomen	3	head/feet

CT Wrist



Coronal Plane
(line through radial and ulnar styloids)



Sagittal Plane
(perpendicular to coronal plane)

CT Hand

Updated 05/05/24
Reviewed 05/15/25

Indications - trauma, fracture, dislocation, pain, bone tumor, soft tissue mass, infection, abscess, soft tissue gas, osteomyelitis, pre/post surgical evaluation.
Bill under CT Upper Extremity charges.

GENERAL SCAN NOTES

Remove any metal from the imaging field of view.
Patient positioning:
Preferred - Patient prone with arm over head in center of scanner, palm down in line with forearm and wrist and with fingers straight and close together.
Option 1 - Patient lateral decubitus position with affected arm extended over head with palm up.
Topogram - from distal radioulnar joint through fingertips.
Craniocaudal scan coverage - from distal radioulnar joint through fingertips if no specific anatomy requested.
Adjust FOV (field of view) on topogram to smallest without cropping anatomy.
IV Contrast: 100 mL Omnipaque-300, inject at 2.5 mL/sec, 60 secs scan delay.
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.

SIEMENS PARAMETERS & RECONS

	Scan Mode	kV	mAs	Care Dose	Care kV & Lvl	Pitch	Acq	Coll	Rot Time	Scan Time
Sensation 16	spiral	120	120	on	NA	0.55	16	0.75	1.0	9.1
Go Up 32	spiral	Sn 110	366	on	on 75	0.40	32	0.7	1.0	6.7
Sensation 64	spiral	120	120	on	NA	0.90	64	0.6	1.0	3.5
Definition 64	spiral	120	100	on	**off**	0.80	64	0.6	1.0	3.9
Go Top 64	spiral	Sn 100	898	on	on 75	0.40	64	0.6	1.0	3.9
Drive 128	spiral	120	70	on	**off**	0.80	128	0.6	1.0	2.0
Force 192	spiral	120	70	on	**off**	0.80	192	0.6	1.0	1.3

Name of Series	Thick	Interval	Kernel	Window	IR Lvl	Recon Direction
AX BONE	2.0	2.0	Br59 / B60f	bone/osteo	3	head/feet
COR BONE	2.0	2.0	Br59 / B60f	bone/osteo	3	front/back
SAG BONE	2.0	2.0	Br59 / B60f	bone/osteo	3	left/right
AX SOFT	2.0	2.0	Br40 / B31f	abdomen	3	head/feet

Send the above recons on the pre contrast scan (if without only) or on the post contrast scan (if IV given).
Send only the following recon on the pre contrast scan (if without and with).

AX SOFT PRE	2.0	2.0	Br40 / B31f	abdomen	3	head/feet

CT Hand

GE PARAMETERS & RECONS

	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	100-440	17.68	on	1.25	10	0.938	9.37	0.5	NA	NA	3.2
Opt 540	helical	large	120	100-440	17.68	on	1.25	10	0.938	9.37	0.5	NA	NA	3.2
LS VCT 64	helical	large body	120	100-450	16.00	on	1.25	40	0.984	39.37	0.5	20	20	0.8
Disc VCT 64	helical	large body	120	100-450	16.00	on	1.25	40	0.984	39.37	0.5	NA	NA	0.8

Name of Series	Thickness	Interval	Recon Algorithm	Window Width/Level	Recon Direction
AX BONE	**1.25**	**1.25**	**bone full**	**2500/480**	**head/feet**
COR BONE	1.25	1.25	bone full	2500/480	front/back
SAG BONE	1.25	1.25	bone full	2500/480	left/right
AX SOFT	1.25	1.25	std full	400/40	head/feet

Must be first recon.

Send the above recons on the pre contrast scan (if without only) or on the post contrast scan (if IV given).

Send only the following recon on the pre contrast scan (if without and with).

AX SOFT PRE	1.25	1.25	std full	400/40	head/feet

PHILIPS PARAMETERS & RECONS

	Scan Mode	kV	Avg mAs	Dose Index	3D Dose	Pitch	Detect	Colli	Rot Time	Scan Time
Incisive 128	helical	120	32	20	**off**	0.80	64	0.625	1.00	1.9

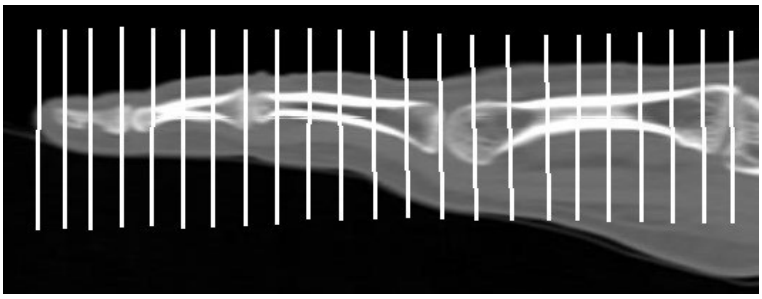
Name of Series	Thick	Interval	Filter	Window	iDose	Recon Direction
AX BONE	2.0	2.0	YC	bone	3	head/feet
COR BONE	2.0	2.0	YC	bone	3	front/back
SAG BONE	2.0	2.0	YC	bone	3	left/right
AX SOFT	2.0	2.0	B	abdomen	3	head/feet

Send the above recons on the pre contrast scan (if without only) or on the post contrast scan (if IV given).

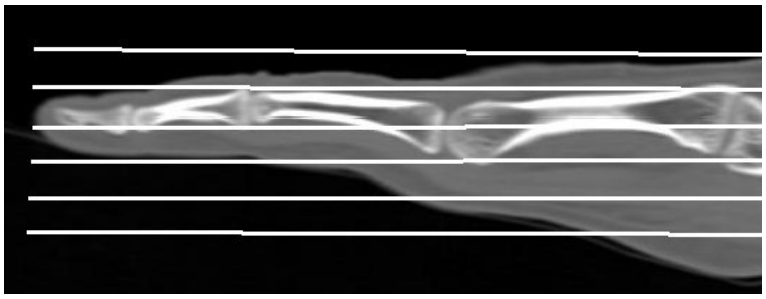
Send only the following recon on the pre contrast scan (if without and with).

AX SOFT PRE	2.0	2.0	B	abdomen	3	head/feet

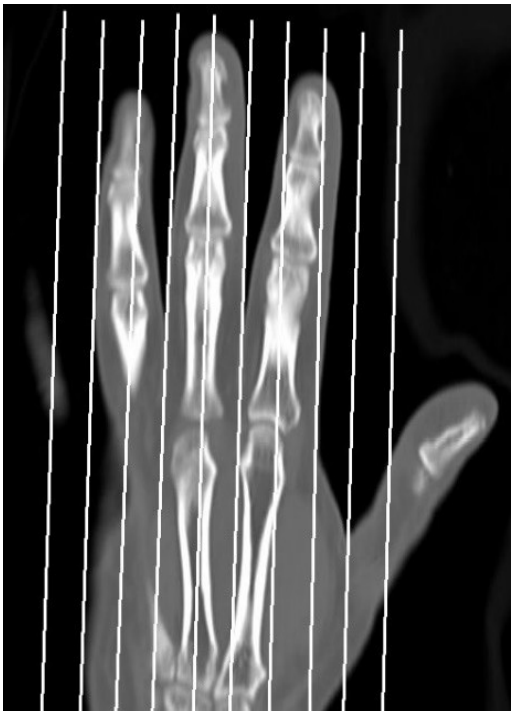
CT Hand



Axial Plane



Coronal Plane



Sagittal Plane

CT Bony Pelvis

Updated 05/05/24
Reviewed 05/15/25

Indications - trauma, fracture, dislocation, pain, bone tumor, soft tissue mass, infection, abscess, soft tissue gas, osteomyelitis, pre/post surgical evaluation.
Bill under CT Pelvis charges.

GENERAL SCAN NOTES

Move the patient's arms over his/her head if possible. Remove any metal from the imaging field of view.
Topogram - iliac crests through lesser trochanters (through prosthesis if present).
Craniocaudal scan coverage - iliac crests through lesser trochanters (through prosthesis if present).
Adjust FOV (field of view) on topogram to smallest without cropping anatomy.
IV Contrast: 100 mL Omnipaque-300, inject at 2.5 mL/sec, 60 secs scan delay.

If protocoled as **sacrum/coccyx** focus:

Coverage - L5 vertebra through bottom of coccyx (top/bottom coverage).
Include both SI joints (side/side coverage).
Technique/Recons - same as bony pelvis.
Bill under CT Pelvis charges.

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.

SIEMENS PARAMETERS & RECONS

	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	5.2
Go Up 32	spiral	130	107	on	on 170	0.80	32	0.7	1.0	11.2
Sensation 64	spiral	120	200	on	NA	0.90	24	1.2	0.5	3.9
Definition 64	spiral	120	210	on	on	0.80	16	1.2	0.5	6.5
Go Top 64	spiral	120	131	on	on 170	0.80	64	0.6	1.0	6.5
Drive 128	spiral	120	147	on	on	0.80	32	1.2	0.5	3.3
Force 192	spiral	120	147	on	on	0.80	48	1.2	0.5	2.2

Name of Series	Thick	Interval	Kernel	Window	IR Lvl	Recon Direction
AX BONE	3.0	3.0	Br59 / B60f	bone/osteo	3	head/feet
COR BONE	3.0	3.0	Br59 / B60f	bone/osteo	3	front/back
SAG BONE	3.0	3.0	Br59 / B60f	bone/osteo	3	left/right
AX SOFT	3.0	3.0	Br40 / B31f	abdomen	3	head/feet

Send the above recons on the pre contrast scan (if without only) or on the post contrast scan (if IV given).

Send only the following recon on the pre contrast scan (if without and with).

AX SOFT PRE	3.0	3.0	Br40 / B31f	abdomen	3	head/feet

CT Bony Pelvis

GE PARAMETERS & RECONS

	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	100-440	19.09	on	2.5	20	1.375	27.50	0.5	NA	NA	3.6
Opt 540	helical	large	120	100-440	19.09	on	2.5	20	1.375	27.50	0.5	NA	NA	3.6
LS VCT 64	helical	large body	120	120-450	11.50	on	2.5	40	0.984	39.37	0.5	30	70	2.5
Disc VCT 64	helical	large body	120	100-700	14.14	on	2.5	40	0.984	39.37	0.8	NA	NA	4.1

Name of Series	Thickness	Interval	Recon Algorithm	Window Width/Level	Recon Direction
AX BONE	**2.5**	**2.5**	**bone full**	**2500/480**	**head/feet**
COR BONE	2.5	2.5	bone full	2500/480	front/back
SAG BONE	2.5	2.5	bone full	2500/480	left/right
AX SOFT	2.5	2.5	std full	400/40	head/feet

Must be first recon.

Send the above recons on the pre contrast scan (if without only) or on the post contrast scan (if IV given).

Send only the following recon on the pre contrast scan (if without and with).

AX SOFT PRE	2.5	2.5	std full	400/40	head/feet

PHILIPS PARAMETERS & RECONS

	Scan Mode	kV	Avg mAs	Dose Index	3D Dose	Pitch	Detect	Colli	Rot Time	Scan Time
Incisive 128	helical	120	103	20	on	0.80	64	0.625	0.75	4.7

Name of Series	Thick	Interval	Filter	Window	iDose	Recon Direction
AX BONE	3.0	3.0	YC	bone	3	head/feet
COR BONE	3.0	3.0	YC	bone	3	front/back
SAG BONE	3.0	3.0	YC	bone	3	left/right
AX SOFT	3.0	3.0	B	abdomen	3	head/feet

Send the above recons on the pre contrast scan (if without only) or on the post contrast scan (if IV given).

Send only the following recon on the pre contrast scan (if without and with).

AX SOFT PRE	3.0	3.0	B	abdomen	3	head/feet

CT Hip

Updated 05/05/24
Reviewed 05/15/25

Indications - trauma, fracture, dislocation, pain, bone tumor, soft tissue mass, infection, abscess, soft tissue gas, osteomyelitis, pre/post surgical evaluation.

Bill under CT Hip charges.

GENERAL SCAN NOTES

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

Topogram - iliac crests through lesser trochanters (through prosthesis if present).

Craniocaudal scan coverage - iliac crests through lesser trochanters (through prosthesis if present). Include contralateral SI joint (side/side coverage).

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

IV Contrast: 100 mL Omnipaque-300, inject at 2.5 mL/sec, 60 secs scan delay.

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.

SIEMENS PARAMETERS & RECONS

	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	2.6
Go Up 32	spiral	130	109	on	on 170	0.80	32	0.7	1.0	5.6
Sensation 64	spiral	120	200	on	NA	0.90	24	1.2	0.5	1.9
Definition 64	spiral	120	190	on	on	0.80	64	0.6	1.0	6.5
Go Top 64	spiral	120	131	on	on 170	0.80	64	0.6	1.0	3.3
Drive 128	spiral	120	133	on	on	0.80	128	0.6	1.0	3.3
Force 192	spiral	120	133	on	on	0.80	192	0.6	1.0	2.2

Name of Series	Thick	Interval	Kernel	Window	IR Lvl	Recon Direction
AX BONE	3.0	3.0	Br59 / B60f	bone/osteo	3	head/feet
COR BONE	3.0	3.0	Br59 / B60f	bone/osteo	3	front/back
SAG BONE	3.0	3.0	Br59 / B60f	bone/osteo	3	left/right
AX SOFT	3.0	3.0	Br40 / B31f	abdomen	3	head/feet

Send the above recons on the pre contrast scan (if without only) or on the post contrast scan (if IV given).

Send only the following recon on the pre contrast scan (if without and with).

AX SOFT PRE	3.0	3.0	Br40 / B31f	abdomen	3	head/feet

Add the following recons for **arthrograms**:

COR SOFT	3.0	3.0	Br40 / B31f	abdomen	3	front/back
SAG SOFT	3.0	3.0	Br40 / B31f	abdomen	3	left/right

CT Hip

GE PARAMETERS & RECONS

	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	100-440	19.09	on	2.5	20	1.375	27.50	0.5	NA	NA	1.8
Opt 540	helical	large	120	100-440	19.09	on	2.5	20	1.375	27.50	0.5	NA	NA	1.8
LS VCT 64	helical	large body	120	120-450	11.50	on	2.5	40	0.984	39.37	0.5	30	70	1.3
Disc VCT 64	helical	large body	120	100-700	14.14	on	2.5	40	0.984	39.37	0.8	NA	NA	2.0

Name of Series	Thickness	Interval	Recon Algorithm	Window Width/Level	Recon Direction
AX BONE	**2.5**	**2.5**	**bone full**	**2500/480**	**head/feet**
COR BONE	2.5	2.5	bone full	2500/480	front/back
SAG BONE	2.5	2.5	bone full	2500/480	left/right
AX SOFT	2.5	2.5	std full	400/40	head/feet

Must be first recon.

Send the above recons on the pre contrast scan (if without only) or on the post contrast scan (if IV given).

Send only the following recon on the pre contrast scan (if without and with).

AX SOFT PRE	2.5	2.5	std full	400/40	head/feet

Add the following recons for **arthrograms**:

COR SOFT	2.5	2.5	std full	400/40	front/back
SAG SOFT	2.5	2.5	std full	400/40	left/right

PHILIPS PARAMETERS & RECONS

	Scan Mode	kV	Avg mAs	Dose Index	3D Dose	Pitch	Detect	Colli	Rot Time	Scan Time
Incisive 128	helical	120	103	20	on	0.80	64	0.625	0.75	2.3

Name of Series	Thick	Interval	Filter	Window	iDose	Recon Direction
AX BONE	3.0	3.0	YC	bone	3	head/feet
COR BONE	3.0	3.0	YC	bone	3	front/back
SAG BONE	3.0	3.0	YC	bone	3	left/right
AX SOFT	3.0	3.0	B	abdomen	3	head/feet

Send the above recons on the pre contrast scan (if without only) or on the post contrast scan (if IV given).

Send only the following recon on the pre contrast scan (if without and with).

AX SOFT PRE	3.0	3.0	B	abdomen	3	head/feet

Add the following recons for **arthrograms**:

COR SOFT	3.0	3.0	B	abdomen	3	front/back
SAG SOFT	3.0	3.0	B	abdomen	3	left/right

CT Knee

Updated 05/04/25
Reviewed 05/15/25

Indications - trauma, fracture, dislocation, pain, bone tumor, soft tissue mass, infection, abscess, soft tissue gas, osteomyelitis, pre/post surgical evaluation.

Bill under CT Knee charges.

GENERAL SCAN NOTES

Remove any metal from the imaging field of view.

Topogram - distal femur to proximal tibia/fibula (through prosthesis if present).

Craniocaudal scan coverage - distal femur to proximal tibia/fibula (through prosthesis if present).

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

IV Contrast: 100 mL Omnipaque-300, inject at 2.5 mL/sec, 60 secs scan delay.

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.

SIEMENS PARAMETERS & RECONS

	Scan Mode	kV	mAs	Care Dose	Care kV & Lvl	Pitch	Acq	Coll	Rot Time	Scan Time
Sensation 16	spiral	120	140	on	NA	0.55	16	0.75	1.0	22.7
Go Up 32	spiral	Sn 110	366	on	on 75	0.40	32	0.7	1.0	16.7
Sensation 64	spiral	120	140	on	NA	0.90	64	0.6	1.0	8.7
Definition 64	spiral	120	100	on	**off**	0.80	64	0.6	1.0	9.8
Go Top 64	spiral	Sn 110	898	on	on	0.40	64	0.6	1.0	9.8
Drive 128	spiral	120	70	on	**off**	0.80	128	0.6	1.0	4.9
Force 192	spiral	120	70	on	**off**	0.80	192	0.6	1.0	3.3

Name of Series	Thick	Interval	Kernel	Window	IR Lvl	Recon Direction
AX BONE	3.0	3.0	Br59 / B60f	bone/osteo	3	head/feet
COR BONE	3.0	3.0	Br59 / B60f	bone/osteo	3	front/back
SAG BONE	3.0	3.0	Br59 / B60f	bone/osteo	3	left/right
AX SOFT	3.0	3.0	Br40 / B31f	abdomen	3	head/feet

Send the above recons on the pre contrast scan (if without only) or on the post contrast scan (if IV given).

Send only the following recon on the pre contrast scan (if without and with).

AX SOFT PRE	3.0	3.0	Br40 / B31f	abdomen	3	head/feet

Add the following recons for **arthrograms**:

COR SOFT	3.0	3.0	Br40 / B31f	abdomen	3	front/back
SAG SOFT	3.0	3.0	Br40 / B31f	abdomen	3	left/right

CT Knee

GE PARAMETERS & RECONS

	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	100-440	12.50	on	2.5	10	0.938	9.37	0.5	NA	NA	8.0
Opt 540	helical	large	120	100-440	12.50	on	2.5	10	0.938	9.37	0.5	NA	NA	8.0
LS VCT 64	helical	large body	120	100-450	16.00	on	2.5	40	0.984	39.37	0.5	20	20	1.9
Disc VCT 64	helical	large body	120	100-450	16.00	on	2.5	40	0.984	39.37	0.5	20	20	1.9

Name of Series	Thickness	Interval	Recon Algorithm	Window Width/Level	Recon Direction
AX BONE	**2.5**	**2.5**	**bone full**	**2500/480**	**head/feet**
COR BONE	2.5	2.5	bone full	2500/480	front/back
SAG BONE	2.5	2.5	bone full	2500/480	left/right
AX SOFT	2.5	2.5	std full	400/40	head/feet

Must be first recon.

Send the above recons on the pre contrast scan (if without only) or on the post contrast scan (if IV given).

Send only the following recon on the pre contrast scan (if without and with).

AX SOFT PRE	2.5	2.5	std full	400/40	head/feet

Add the following recons for **arthrograms**:

COR SOFT	2.5	2.5	std full	400/40	front/back
SAG SOFT	2.5	2.5	std full	400/40	left/right

PHILIPS PARAMETERS & RECONS

	Scan Mode	kV	Avg mAs	Dose Index	3D Dose	Pitch	Detect	Colli	Rot Time	Scan Time
Incisive 128	helical	120	32	20	**off**	0.80	64	0.625	1.00	4.7

Name of Series	Thick	Interval	Filter	Window	iDose	Recon Direction
AX BONE	3.0	3.0	YB	bone	3	head/feet
COR BONE	3.0	3.0	YB	bone	3	front/back
SAG BONE	3.0	3.0	YB	bone	3	left/right
AX SOFT	3.0	3.0	B	abdomen	3	head/feet

Send the above recons on the pre contrast scan (if without only) or on the post contrast scan (if IV given).

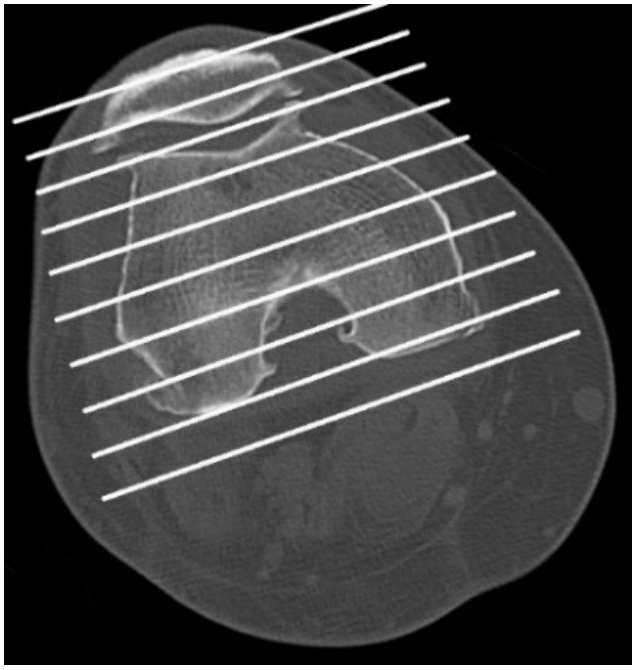
Send only the following recon on the pre contrast scan (if without and with).

AX SOFT PRE	3.0	3.0	B	abdomen	3	head/feet

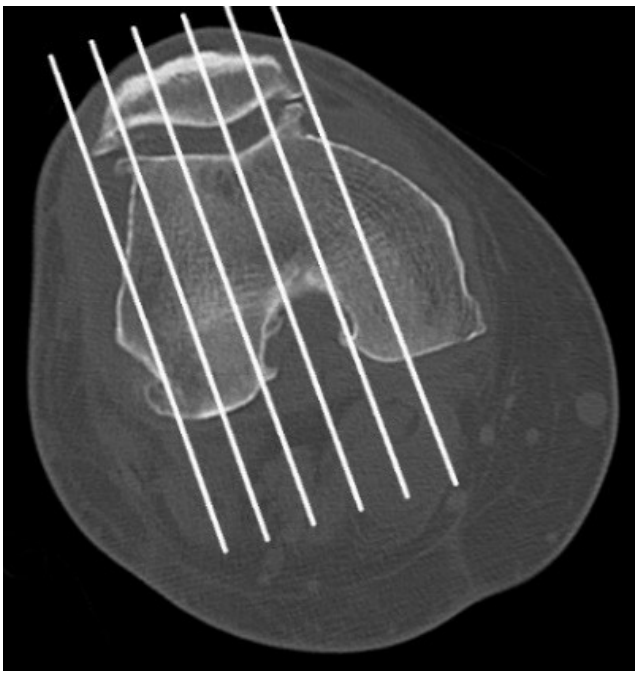
Add the following recons for **arthrograms**:

COR SOFT	3.0	3.0	B	abdomen	3	front/back
SAG SOFT	3.0	3.0	B	abdomen	3	left/right

CT Knee



Coronal Plane



Sagittal Plane

CT Ankle/Hindfoot

Updated 05/05/25
Reviewed 05/15/25

Indications - trauma, fracture, dislocation, pain, bone tumor, soft tissue mass, infection, abscess, soft tissue gas, osteomyelitis, pre/post surgical evaluation.

Bill under CT Ankle charges.

GENERAL SCAN NOTES

Remove any metal from the imaging field of view.

Patient positioning:

Have opposite leg bent at knee with ankle/foot out of way of ankle of interest.

Foot must be dorsiflexed with foot perpendicular to tibia (see images at end of protocol).

Topogram - distal tibia through bottom of foot.

Craniocaudal scan coverage - 3 cm above ankle joint through skin of ball of foot.

Base of metatarsals through skin over Achilles tendon (front/back coverage).

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

IV Contrast: 100 mL Omnipaque-300, inject at 2.5 mL/sec, 60 secs scan delay.

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.

SIEMENS PARAMETERS & RECONS

	Scan Mode	kV	mAs	Care Dose	Care kV & Lvl	Pitch	Acq	Coll	Rot Time	Scan Time
Sensation 16	spiral	120	120	on	NA	0.55	16	0.75	1.0	5.3
Go Up 32	spiral	Sn 110	366	on	on 75	0.40	32	0.7	1.0	3.9
Sensation 64	spiral	120	120	on	NA	0.90	64	0.6	1.0	2.0
Definition 64	spiral	120	100	on	**off**	0.80	64	0.6	1.0	2.3
Go Top 64	spiral	Sn 100	898	on	on 75	0.40	64	0.6	1.0	2.3
Drive 128	spiral	120	70	on	**off**	0.80	128	0.6	1.0	1.1
Force 192	spiral	120	70	on	**off**	0.80	192	0.6	1.0	0.8

Name of Series	Thick	Interval	Kernel	Window	IR Lvl	Recon Direction
AX BONE	2.0	2.0	Br59 / B60f	bone/osteo	3	head/feet
COR BONE	2.0	2.0	Br59 / B60f	bone/osteo	3	front/back
SAG BONE	2.0	2.0	Br59 / B60f	bone/osteo	3	left/right
AX SOFT	2.0	2.0	Br40 / B31f	abdomen	3	head/feet

Send the above recons on the pre contrast scan (if without only) or on the post contrast scan (if IV given).

Send only the following recon on the pre contrast scan (if without and with).

AX SOFT PRE	2.0	2.0	Br40 / B31f	abdomen	3	head/feet

CT Ankle/Hindfoot

GE PARAMETERS & RECONS

	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	100-440	17.68	on	1.25	10	0.938	9.37	0.5	NA	NA	1.9
Opt 540	helical	large	120	100-440	17.68	on	1.25	10	0.938	9.37	0.5	NA	NA	1.9
LS VCT 64	helical	large body	120	100-450	22.63	on	1.25	40	0.984	39.37	0.5	20	20	0.4
Disc VCT 64	helical	large body	120	100-450	22.63	on	1.25	40	0.984	39.37	0.5	NA	NA	0.4

Name of Series	Thickness	Interval	Recon Algorithm	Window Width/Level	Recon Direction
AX BONE	**1.25**	**1.25**	**bone full**	**2500/480**	**head/feet**
COR BONE	1.25	1.25	bone full	2500/480	front/back
SAG BONE	1.25	1.25	bone full	2500/480	left/right
AX SOFT	1.25	1.25	std full	400/40	head/feet

Must be first recon.

Send the above recons on the pre contrast scan (if without only) or on the post contrast scan (if IV given).

Send only the following recon on the pre contrast scan (if without and with).

AX SOFT PRE	1.25	1.25	std full	400/40	head/feet

PHILIPS PARAMETERS & RECONS

	Scan Mode	kV	Avg mAs	Dose Index	3D Dose	Pitch	Detect	Colli	Rot Time	Scan Time
Incisive 128	helical	120	85	32	on	0.80	64	0.625	1.00	1.1

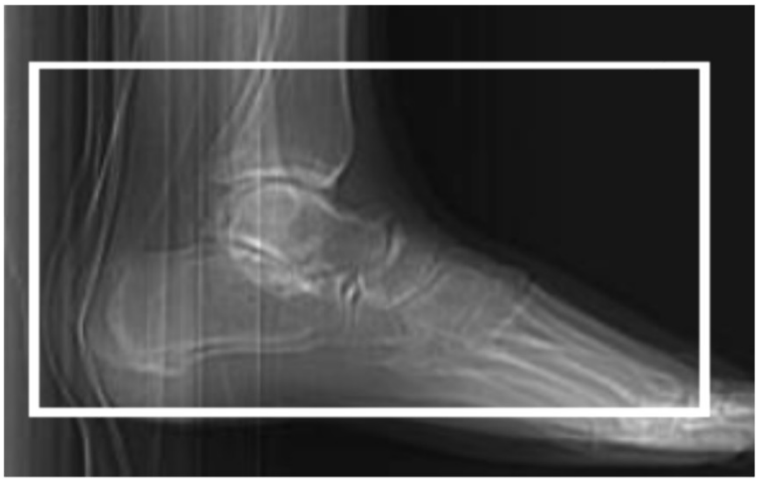
Name of Series	Thick	Interval	Filter	Window	iDose	Recon Direction
AX BONE	2.0	2.0	YC	bone	3	head/feet
COR BONE	2.0	2.0	YC	bone	3	front/back
SAG BONE	2.0	2.0	YC	bone	3	left/right
AX SOFT	2.0	2.0	B	abdomen	3	head/feet

Send the above recons on the pre contrast scan (if without only) or on the post contrast scan (if IV given).

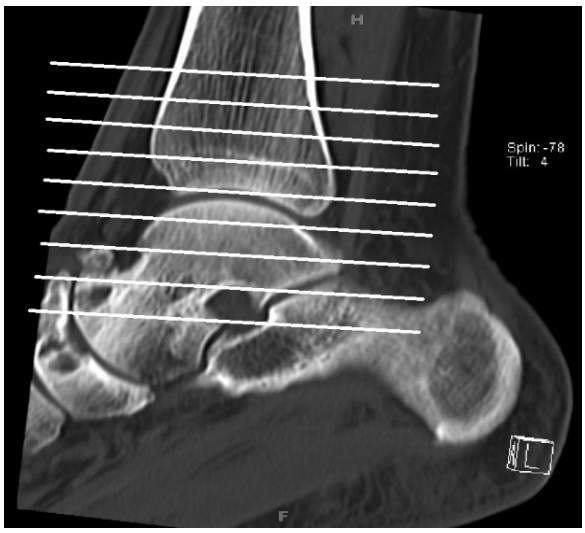
Send only the following recon on the pre contrast scan (if without and with).

AX SOFT PRE	2.0	2.0	B	abdomen	3	head/feet

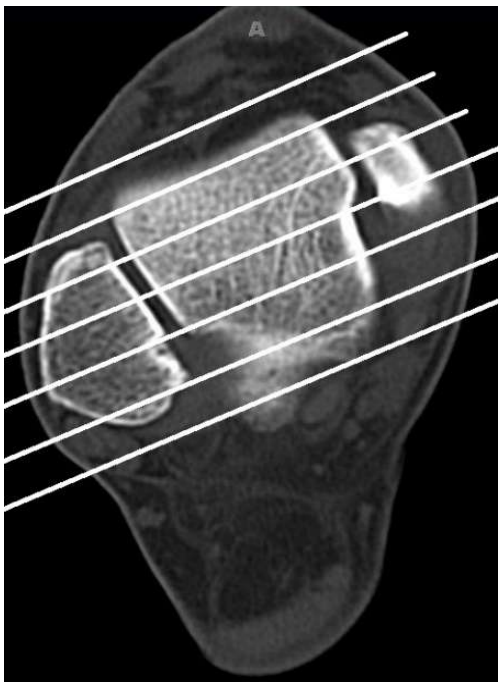
CT Ankle/Hindfoot



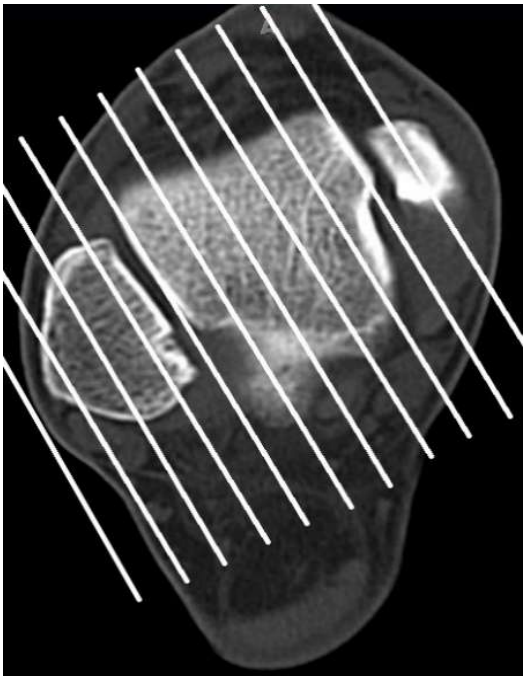
Foot must be dorsiflexed with foot perpendicular to tibia.



Axial Plane



Coronal Plane



Sagittal Plane

CT Forefoot

Updated 05/05/25
Reviewed 05/15/25

Indications - trauma, fracture, dislocation, pain, bone tumor, soft tissue mass, infection, abscess, soft tissue gas, osteomyelitis, pre/post surgical evaluation.

Bill under CT Lower Extremity charges.

GENERAL SCAN NOTES

Remove any metal from the imaging field of view.

Patient positioning - have opposite leg bent at knee with ankle/foot out of way of foot of interest.

Topogram - distal tibia through bottom of foot.

Craniocaudal scan coverage - skin of dorsum of forefoot/toes through skin of plantar aspect of forefoot/toes. Skin of toes through 1 cm posterior to tarsometatarsal joints (front/back coverage).

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

IV Contrast: 100 mL Omnipaque-300, inject at 2.5 mL/sec, 60 secs scan delay.

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.

SIEMENS PARAMETERS & RECONS

	Scan Mode	kV	mAs	Care Dose	Care kV & Lvl	Pitch	Acq	Coll	Rot Time	Scan Time
Sensation 16	spiral	120	120	on	NA	0.55	16	0.75	1.0	5.3
Go Up 32	spiral	Sn 110	366	on	on 75	0.40	32	0.7	1.0	3.9
Sensation 64	spiral	120	120	on	NA	0.90	64	0.6	1.0	2.0
Definition 64	spiral	120	100	on	**off**	0.80	64	0.6	1.0	2.3
Go Top 64	spiral	Sn 100	898	on	on 75	0.40	64	0.6	1.0	2.3
Drive 128	spiral	120	70	on	**off**	0.80	128	0.6	1.0	1.1
Force 192	spiral	120	70	on	**off**	0.80	192	0.6	1.0	0.8

Name of Series	Thick	Interval	Kernel	Window	IR Lvl	Recon Direction
AX BONE	2.0	2.0	Br59 / B60f	bone/osteo	3	head/feet
COR BONE	2.0	2.0	Br59 / B60f	bone/osteo	3	front/back
SAG BONE	2.0	2.0	Br59 / B60f	bone/osteo	3	left/right
AX SOFT	2.0	2.0	Br40 / B31f	abdomen	3	head/feet

Send the above recons on the pre contrast scan (if without only) or on the post contrast scan (if IV given).

Send only the following recon on the pre contrast scan (if without and with).

AX SOFT PRE	2.0	2.0	Br40 / B31f	abdomen	3	head/feet

CT Forefoot

GE PARAMETERS & RECONS

	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	100-440	17.68	on	1.25	10	0.938	9.37	0.5	NA	NA	1.9
Opt 540	helical	large	120	100-440	17.68	on	1.25	10	0.938	9.37	0.5	NA	NA	1.9
LS VCT 64	helical	large body	120	100-450	22.63	on	1.25	40	0.984	39.37	0.5	20	20	0.4
Disc VCT 64	helical	large body	120	100-450	22.63	on	1.25	40	0.984	39.37	0.5	NA	NA	0.4

Name of Series	Thickness	Interval	Recon Algorithm	Window Width/Level	Recon Direction
AX BONE	**1.25**	**1.25**	**bone full**	**2500/480**	**head/feet**
COR BONE	1.25	1.25	bone full	2500/480	front/back
SAG BONE	1.25	1.25	bone full	2500/480	left/right
AX SOFT	1.25	1.25	std full	400/40	head/feet

Must be first recon.

Send the above recons on the pre contrast scan (if without only) or on the post contrast scan (if IV given).

Send only the following recon on the pre contrast scan (if without and with).

AX SOFT PRE	1.25	1.25	std full	400/40	head/feet

PHILIPS PARAMETERS & RECONS

	Scan Mode	kV	Avg mAs	Dose Index	3D Dose	Pitch	Detect	Colli	Rot Time	Scan Time
Incisive 128	helical	120	85	32	on	0.80	64	0.625	1.00	1.1

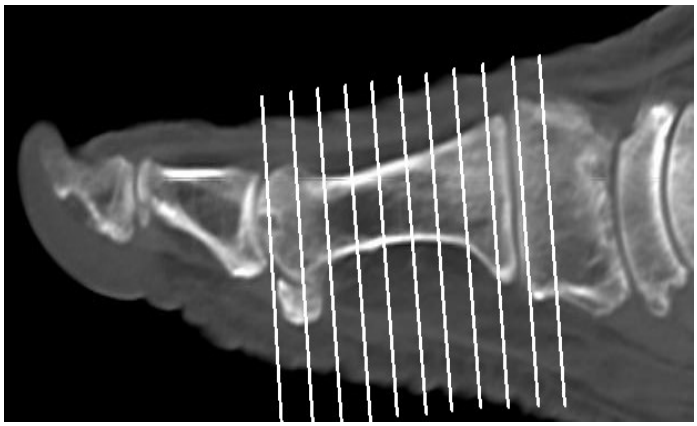
Name of Series	Thick	Interval	Filter	Window	iDose	Recon Direction
AX BONE	2.0	2.0	YC	bone	3	head/feet
COR BONE	2.0	2.0	YC	bone	3	front/back
SAG BONE	2.0	2.0	YC	bone	3	left/right
AX SOFT	2.0	2.0	B	abdomen	3	head/feet

Send the above recons on the pre contrast scan (if without only) or on the post contrast scan (if IV given).

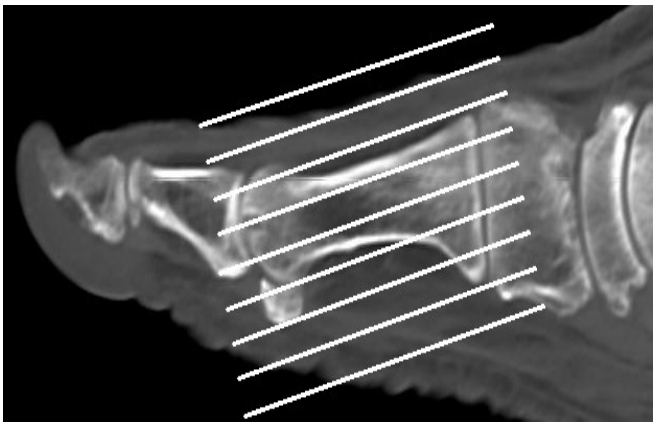
Send only the following recon on the pre contrast scan (if without and with).

AX SOFT PRE	2.0	2.0	B	abdomen	3	head/feet

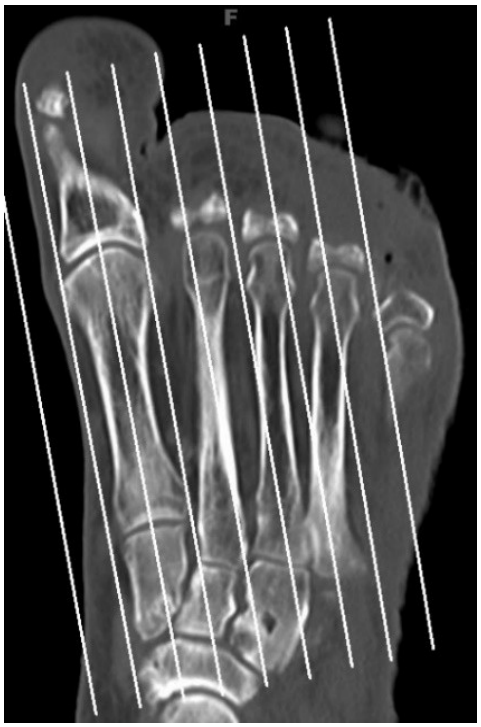
CT Forefoot



Axial Plane



Coronal Plane



Sagittal Plane

CT Long Bones

Updated 05/05/25
Reviewed 05/15/25

Indications - trauma, fracture, dislocation, pain, bone tumor, soft tissue mass, infection, abscess, soft tissue gas, osteomyelitis, pre/post surgical evaluation.

Bill under:

CT Humerus charges for **humerus**.

CT Upper Extremity charges for **radius/ulna**.

CT Femur charges for **femur**.

CT Lower Extremity charges for **tibia/fibula**.

GENERAL SCAN NOTES

Remove any metal from the imaging field of view.

Topogram / Craniocaudal scan coverage:

Radius/Ulna - just above elbow to just below wrist.

Humerus - just above humeral head to just below elbow.

Femur - just above acetabulum to just below knee.

Tibia/Fibula - just above knee to just below ankle.

Scan through entire prosthesis or fracture if one is present.

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

IV Contrast: 100 mL Omnipaque-300, inject at 2.5 mL/sec, 60 secs scan delay.

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.

CT Long Bones

SIEMENS PARAMETERS & RECONS

	Scan Mode	kV	mAs	Care Dose	Care kV & Lvl	Pitch	Acq	Coll	Rot Time	Scan Time
Sensation 16	spiral	120	150	on	NA	0.80	16	0.75	1.0	31.3
Go Up 32	spiral	Sn 110	366	on	on 75	0.40	32	0.7	1.0	33.5
Sensation 64	spiral	120	150	on	NA	0.90	64	0.6	1.0	17.4
Definition 64	spiral	120	100	on	**off**	0.80	64	0.6	1.0	19.5
Go Top 64	spiral	Sn 100	898	on	on 75	0.40	64	0.6	1.0	19.5
Drive 128	spiral	120	70	on	**off**	0.80	128	0.6	1.0	9.8
Force 192	spiral	120	70	on	**off**	0.80	192	0.6	1.0	6.5

Name of Series	Thick	Interval	Kernel	Window	IR Lvl	Recon Direction
AX BONE	3.0	3.0	Br59 / B60f	bone/osteo	3	head/feet
COR BONE	3.0	3.0	Br59 / B60f	bone/osteo	3	front/back
SAG BONE	3.0	3.0	Br59 / B60f	bone/osteo	3	left/right
AX SOFT	3.0	3.0	Br40 / B31f	abdomen	3	head/feet

Send the above recons on the pre contrast scan (if without only) or on the post contrast scan (if IV given).

Send only the following recon on the pre contrast scan (if without and with).

AX SOFT PRE	3.0	3.0	Br40 / B31f	abdomen	3	head/feet

GE PARAMETERS & RECONS

	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	100-440	12.50	on	2.5	10	0.938	9.37	0.5	NA	NA	16.0
Opt 540	helical	large	120	100-440	12.50	on	2.5	10	0.938	9.37	0.5	NA	NA	16.0
LS VCT 64	helical	large body	120	100-450	16.00	on	2.5	40	0.984	39.37	0.5	20	20	3.8
Disc VCT 64	helical	large body	140	100-610	14.14	on	2.5	40	0.516	20.625	0.6	NA	NA	8.7

Name of Series	Thickness	Interval	Recon Algorithm	Window Width/Level	Recon Direction
AX BONE	**2.5**	**2.5**	**bone full**	**2500/480**	**head/feet**
COR BONE	2.5	2.5	bone full	2500/480	front/back
SAG BONE	2.5	2.5	bone full	2500/480	left/right
AX SOFT	2.5	2.5	std full	400/40	head/feet

Must be first recon.

Send the above recons on the pre contrast scan (if without only) or on the post contrast scan (if IV given).

Send only the following recon on the pre contrast scan (if without and with).

AX SOFT PRE	2.5	2.5	std full	400/40	head/feet

CT Long Bones

PHILIPS PARAMETERS & RECONS

	Scan Mode	kV	Avg mAs	Dose Index	3D Dose	Pitch	Detect	Colli	Rot Time	Scan Time
Incisive 128	helical	120	129	22	on	0.80	64	0.625	1.00	9.4

Name of Series	Thick	Interval	Filter	Window	iDose	Recon Direction
AX BONE	3.0	3.0	YC	bone	3	head/feet
COR BONE	3.0	3.0	YC	bone	3	front/back
SAG BONE	3.0	3.0	YC	bone	3	left/right
AX SOFT	3.0	3.0	B	abdomen	3	head/feet

Send the above recons on the pre contrast scan (if without only) or on the post contrast scan (if IV given).

Send only the following recon on the pre contrast scan (if without and with).

AX SOFT PRE	3.0	3.0	B	abdomen	3	head/feet

CT Limb Length

Updated 05/05/25
Reviewed 05/15/25

Indications - leg length discrepancy.
Bill under CT LE w/o Contrast Bilateral charge.

GENERAL SCAN NOTES

Remove any metal from the imaging field of view.
Get ruler from X-Ray.
Topogram scan only.

SIEMENS PARAMETERS

	kVp	mA	Scan Length	Kernel	Window
Sensation 16	120	35	1536	T20	Topogram Body
Go Up 32	130	30	1536	Tr20	Topogram Body
Sensation 64	120	35	1536	T20	Topogram Body
Definition 64	100	20	1536	Tr20	Topogram Body
Go Top 64	Sn 140	60	1536	Tr20	Topogram Body
Drive 128	100	20	1536	Tr20	Topogram Body
Force 192	Sn 100	75	1536	Tr20	Topogram Body

GE PARAMETERS

	kV	mA	Scan Length	Window Width/Level
LS 16	120	10	1536	250/-250
Opt 540	120	10	1536	250/-250
LS VCT 64	120	10	1536	250/-250
Disc VCT 64	120	10	1536	250/-250

PHILIPS PARAMETERS & RECONS

	kV	mA	Scan Length
Incisive 128	120	30	1536

CT Catalyst Shoulder

Updated 09/25/25
Reviewed 09/25/25

Indications - pre surgical evaluation for shoulder joint replacement.
Bill under CT Shoulder charges.

GENERAL SCAN NOTES

Remove any metal from the imaging field of view.
Arms in neutral position by patient's side.
Topogram - from above top of shoulder to proximal humerus.
Craniocaudal scan coverage - from above top of clavicle to proximal humerus.
Include entire ipsilateral scapula in FOV.
Matrix must be 512 x 512.
IV Contrast: not given for this protocol.
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.

SIEMENS PARAMETERS & RECONS

	Scan Mode	kV	mAs	Care Dose	Care kV & Lvl	Pitch	Acq	Coll	Rot Time	Scan Time
Sensation 16	spiral	120	150	on	NA	0.80	16	0.75	1.0	10.4
Go Up 32	spiral	130	84	on	on 130	0.80	32	0.7	1.0	5.6
Sensation 64	spiral	120	150	on	NA	0.90	64	0.6	1.0	5.8
Definition 64	spiral	120	165	on	on	0.80	64	0.6	1.0	6.5
Go Top 64	spiral	130	100	on	on 130	0.80	64	0.6	1.0	3.3
Drive 128	spiral	120	116	on	on	0.80	128	0.6	1.0	3.3
Force 192	spiral	120	116	on	on	0.80	192	0.6	1.0	2.2

Name of Series	Thick	Interval	Kernel	Window	IR Lvl	Recon Direction	
AX BONE	3.0	3.0	Br59 / B60f	bone/osteo	3	head/feet	
COR BONE	3.0	3.0	Br59 / B60f	bone/osteo	3	front/back	
SAG BONE	3.0	3.0	Br59 / B60f	bone/osteo	3	left/right	
AX SOFT	3.0	3.0	Br40 / B31f	abdomen	3	head/feet	
AX THINS	**0.625**	**0.5**	**Br40 / B31f**	**bone/osteo**	**3**	**head/feet**	**Catalyst specific recon.**

If the scan parameters do not allow for 0.625 mm thickness, pick as close to 0.5 mm as the scanner will allow but no thicker than 1.0 mm. The interval cannot be thicker than 0.5 mm.

CT Catalyst Shoulder

GE PARAMETERS & RECONS

	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	100-440	12.50	on	2.5	10	0.938	9.37	0.5	NA	NA	5.3
Opt 540	helical	large	120	100-440	12.50	on	2.5	10	0.938	9.37	0.5	NA	NA	5.3
LS VCT 64	helical	large body	120	100-450	16.00	on	2.5	40	0.984	39.37	0.5	20	20	1.3
Disc VCT 64	helical	large body	140	100-610	14.14	on	2.5	40	0.516	20.625	0.6	NA	NA	2.9

Name of Series	Thickness	Interval	Recon Algorithm	Window Width/Level	Recon Direction	
AX BONE	**2.5**	**2.5**	**bone full**	**2500/480**	**head/feet**	**Must be first recon.**
COR BONE	2.5	2.5	bone full	2500/480	front/back	
SAG BONE	2.5	2.5	bone full	2500/480	left/right	
AX SOFT	2.5	2.5	std full	400/40	head/feet	
AX THINS	**0.625**	**0.5**	**std full**	**2500/480**	**head/feet**	**Catalyst specific recon.**

If the scan parameters do not allow for 0.625 mm thickness, pick as close to 0.5 mm as the scanner will allow but no thicker than 1.0 mm. The interval cannot be thicker than 0.5 mm.

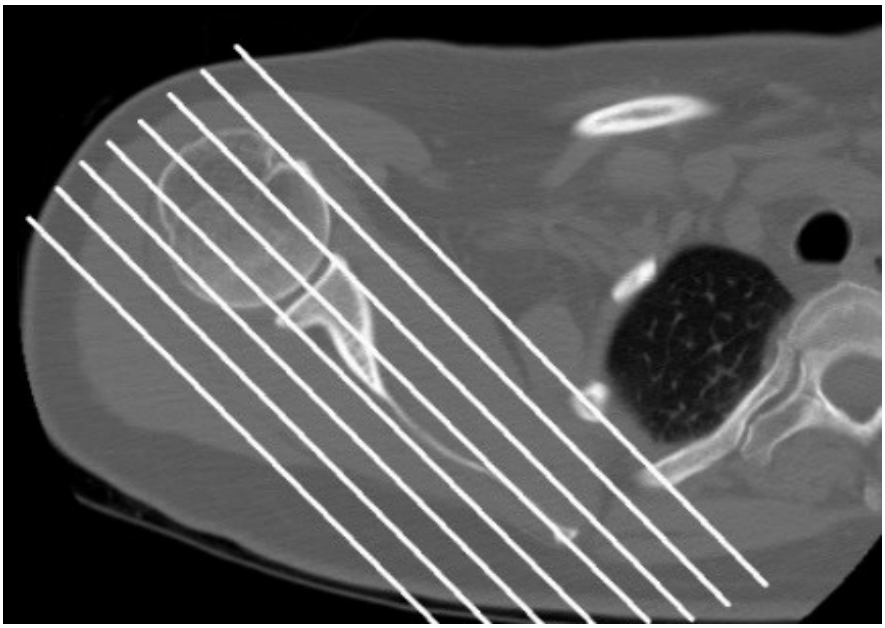
PHILIPS PARAMETERS & RECONS

	Scan Mode	kV	Avg mAs	Dose Index	3D Dose	Pitch	Detect	Colli	Rot Time	Scan Time
Incisive 128	helical	120	129	22	on	0.80	64	0.625	1.00	3.1

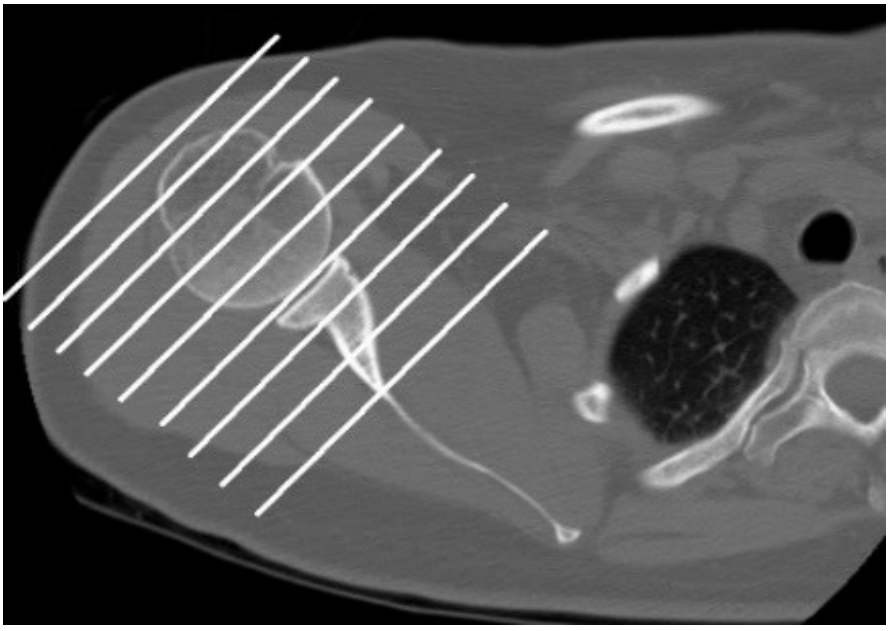
Name of Series	Thick	Interval	Filter	Window	iDose	Recon Direction	
AX BONE	3.0	3.0	YC	bone	3	head/feet	
COR BONE	3.0	3.0	YC	bone	3	front/back	
SAG BONE	3.0	3.0	YC	bone	3	left/right	
AX SOFT	3.0	3.0	B	abdomen	3	head/feet	
AX THINS	**0.625**	**0.5**	**B**	**bone**	**3**	**head/feet**	**Catalyst specific recon.**

If the scan parameters do not allow for 0.625 mm thickness, pick as close to 0.5 mm as the scanner will allow but no thicker than 1.0 mm. The interval cannot be thicker than 0.5 mm.

CT Catalyst Shoulder



Coronal Plane



Sagittal Plane

Archer™ 3D Targeting
by Catalyst OrthoScience®

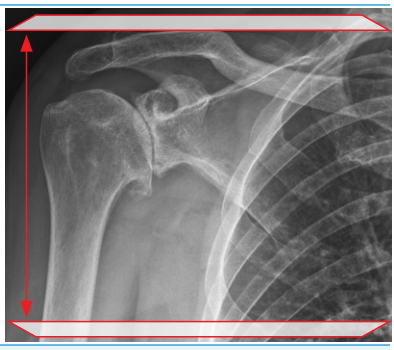
POWERED BY 3D-SHOULDER

CT PROTOCOL REFERENCE CARD

PATIENT POSITION
When positioning the patient, ensure the patient is in supine position (SFF: Supine, Feet First). Additionally, ensure the patient's shoulders and arms are in a natural position, with the arms lying alongside the body. The patient shall not move during the scan procedure.

ANATOMY TO SCAN
When scanning the patient, be certain the scan captures the entire scapula and proximal humerus, from the acromioclavicular joint to the bottom end of the scapula. The acromion and coracoid are also required for the scan.

SCAN PARAMETERS

Scan Type	CT Scan without contrast (no arthrography)
Axial Slice Thickness	Slice thickness: 0.5mm is preferred; 1.0mm is acceptable Slice increment: 0.0mm - 0.5 mm Slice increment should NOT be greater than the slice thickness
Field Of View (FOV)	FOV includes the whole scapula and the proximal humerus. It starts a few slices above the AC joint. 
DO NOT	**Inject contrast product** **Change the coordinates system during the acquisition** **Change the image parameters** **Merge several CT scan acquisitions into one**
Matrix	512 x 512
Reconstruction Parameters	Standard algorithm without edge enhancement Bone filter is suitable Any filter beneficial to the diagnosis (e.g., metal artifact reduction) can be additionally calculated No gantry tilt No oblique reconstructions

DATA FORMAT
The CT scan must be exported as a primary scan in DICOM format without compression, axial slices only.

ADDITIONAL REQUIREMENTS
The original data must be archived by the radiology center.

Anonymization of images is kept at the discretion of the hospital policy. Patient's data will be pseudonymized when fed into the software (first 3 letters of last name, first 3 letters of first name).

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Naples, FL 34110 (800) 587.5137
1234-2101-A 102021

CT Mako Hip

Updated 03/09/25
Reviewed 05/15/25

Indications - pre surgical evaluation for hip joint replacement.
Bill under CT LE w/o Contrast charge. Do not include separate hip and knee charges.

GENERAL SCAN NOTES

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

Patient in supine position with feet first with both knees and ankles aligned.

Do not allow patient movement between or during the scans.

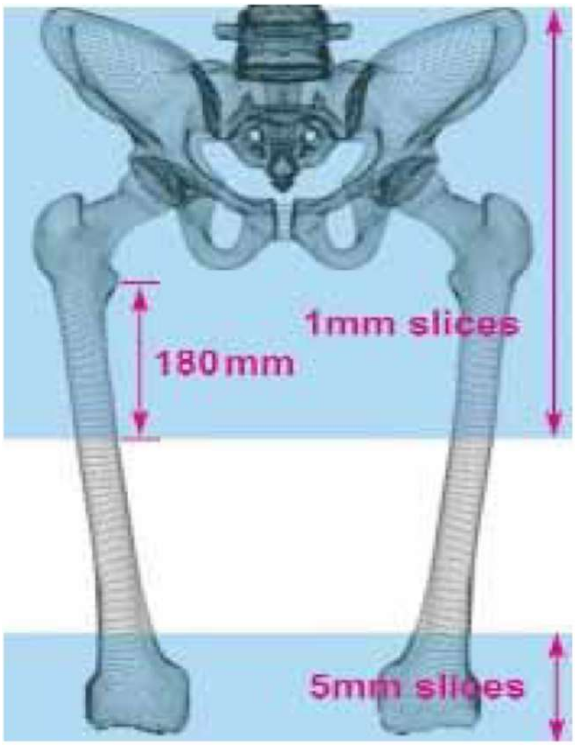
Topogram - iliac crests through mid lower leg.
Craniocaudal scan coverage (see image below):

Hip - iliac crests to 18 cm below lesser trochanter of femur. FOV to include both sides of pelvic bones.

Knee - 10 cm above knee joint to 10 cm below knee joint. FOV to include both knees.

FOV must be <500 mm and matrix must be 512 x 512 squared.

IV Contrast: not given for this protocol.
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.
Prepare an uncompressed DICOM disc containing all images (without DICOM viewer).



Craniocaudal Scan Coverage

CT Mako Hip

SIEMENS PARAMETERS & RECONS

For both **Hip** and **Knee** scans:

	Scan Mode	kV	mAs	Care Dose	Care kV & Lvl	Pitch	Acq	Coll	Rot Time
Sensation 16	spiral	120	200	on	NA	0.80	16	0.75	0.5
Go Up 32	spiral	130	200	on	on 170	0.80	32	0.7	1.0
Sensation 64	spiral	120	200	on	NA	0.90	64	0.6	0.5
Definition 64	spiral	120	200	on	on	0.80	64	0.6	1.0
Go Top 64	spiral	120	200	on	on 170	0.80	64	0.6	1.0
Drive 128	spiral	120	200	on	on	0.80	128	0.6	1.0
Force 192	spiral	120	200	on	on	0.80	192	0.6	1.0

HIP RECONS

Name of Series	Thick	Interval	Kernel	Window	IR Lvl	Recon Direction	
AX HIP BONE	3.0	3.0	Br59 / B60	bone/osteo	3	head/feet	
COR HIP BONE	3.0	3.0	Br59 / B60	bone/osteo	3	front/back	
SAG HIP BONE	3.0	3.0	Br59 / B60	bone/osteo	3	left/right	
AX HIP THINS	**1.0**	**1.0**	**Br59 / B60**	**abdomen**	**3**	**head/feet**	**Mako specific recon.**

KNEE RECONS

AX KNEE BONE	**3.0**	**3.0**	**Br59 / B60**	**bone/osteo**	**3**	**head/feet**	**Mako specific recon.**
COR KNEE BONE	3.0	3.0	Br59 / B60	bone/osteo	3	front/back	
SAG KNEE BONE	3.0	3.0	Br59 / B60	bone/osteo	3	left/right	

CT Mako Hip

GE PARAMETERS & RECONS

For both **Hip** and **Knee** scans:

	Scan Type	SFOV	kV	mA Range	Noise Index	Smart mA	Slice Thick	Beam Coll	Pitch	Speed	Rot Time	Dose Red	ASIR
LS 16	helical	large	120	100-440	19.09	on	2.5	20	1.375	27.50	0.5	NA	NA
Opt 540	helical	large	120	100-440	19.09	on	2.5	20	1.375	27.50	0.5	NA	NA
LS VCT 64	helical	large body	120	120-450	11.50	on	2.5	40	0.984	39.37	0.5	30	70
Disc VCT 64	helical	large body	120	100-700	14.14	on	2.5	40	0.984	39.37	0.8	NA	NA

HIP RECONS

Name of Series	Thickness	Interval	Recon Algorithm/Mode	Window Width/Level	Recon Direction	
AX HIP BONE	**2.5**	**2.5**	**bone full**	**2500/480**	**head/feet**	**Must be first recon.**
COR HIP BONE	2.5	2.5	bone full	2500/480	front/back	
SAG HIP BONE	2.5	2.5	bone full	2500/480	left/right	
AX HIP THINS	**0.625**	**0.625**	**bone plus full**	**2500/480**	**head/feet**	**Mako specific recon.**

KNEE RECONS

AX KNEE BONE	**2.5**	**2.5**	**bone full**	**2500/480**	**head/feet**	**Must be first recon.**
COR KNEE BONE	2.5	2.5	bone full	2500/480	front/back	**Mako specific recon.**
SAG KNEE BONE	2.5	2.5	bone full	2500/480	left/right	

CT Mako Hip

PHILIPS PARAMETERS & RECONS

For both **Hip** and **Knee** scans:

	Scan Mode	kV	Avg mAs	Dose Index	3D Dose	Pitch	Detect	Colli	Rot Time
Incisive 128	helical	120	285	29	**off**	1.00	64	0.625	0.75

HIP RECONS

Name of Series	Thick	Interval	Filter	Window	iDose	Recon Direction	
AX HIP BONE	3.0	3.0	YC	bone	3	head/feet	
COR HIP BONE	3.0	3.0	YC	bone	3	front/back	
SAG HIP BONE	3.0	3.0	YC	bone	3	left/right	
AX HIP THINS	**1.0**	**1.0**	**YC**	**bone**	**3**	**head/feet**	**Mako specific recon.**

KNEE RECONS

AX KNEE BONE	**3.0**	**3.0**	**YC**	**bone**	**3**	**head/feet**	**Mako specific recon.**
COR KNEE BONE	3.0	3.0	YC	bone	3	front/back	
SAG KNEE BONE	3.0	3.0	YC	bone	3	left/right	

1. PATIENT SETUP AND CONFIGURATION

- Scan patient in supine position feet first, anytime before MAKOplasty® THA procedure (up to 8 weeks in advance).
- Position patient to minimize pelvic obliquity through the following measures:
  - Align both ankles and both knees
  - Ensure patient is in true supine position by palpating the anterior superior iliac spines and comparing relative height above the CT scanner bed
  - Align longitudinal axis of the body with longitudinal axis of CT scanning bed

2. IMAGING REQUIREMENTS

Two regions:

- Continuous scan with regions (using one series or topogram with two groups)

Pelvis + Proximal Femur

- 0.5 - 1mm interval spacing throughout the scan. No gap / no overlap
- Axial slices (1:1 pitch) using helical (spiral) scanning
- FOV: Scan includes the entire bi-lateral pelvis (Medial/ Lateral/Anterior/Posterior/Superior) and at least 180mm below the lesser trochanter on the femur
- Table not included in the scan
- Complete Scanning and Data reconstruction in bone
- 512 x 512 matrix: Image must be a square
- kV: 120 - 140
- mA: 200 - 250

Knee

- 2.0 - 5.0mm interval spacing throughout the scan
- Axial slices (1:1 pitch) using helical (spiral) scanning
- FOV: Scan includes bilateral knee - joint lines between femur and tibia and 10cm proximal to joint line on femur
- Complete scanning and data reconstruction in bone
- 512 x 512 matrix: Image must be a square
- kV: 120 - 140
- mA: 200 - 250

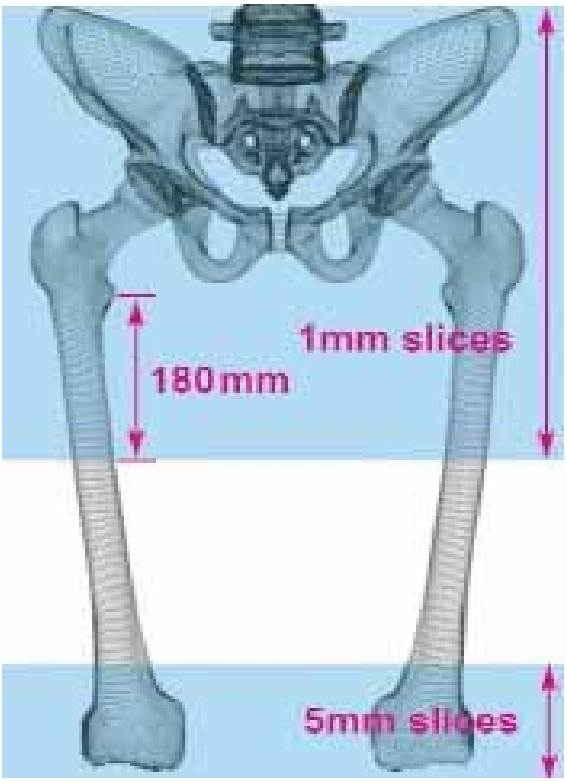


Figure 1. Scan Location and Characteristics

FOV should not exceed 500 mm

Slice Interval Spacing, mm	Distance mm	Number of Slices
0.500	180	360
0.625	180	288
0.750	180	240
0.875	180	206
1.000	180	180

3. POSITIONING THE PATIENT

During the scan, the pelvis and leg must remain motionless.

Imaging Artifacts

- Ensuring the patient is comfortable and relaxed is an important factor for achieving a motionless scan
- If metallic components are present in the pelvis or proximal femur, it may not be possible to obtain an image of significant quality to support a RIO® THA procedure
- Move metallic component away from scan region, if possible or use a metal suppression scan protocol

4. POST SCAN EXAMINATION

Scan Region

The physician and CT technologist should verify the following:

- Patient's orientation is correct
- Regions of interest in protocol are visible in dataset
- Image slice thickness resulted as required by the protocol
- Bone images in scan image are not degraded by metal-induced artifacts

5. DATASET TRANSFER

Archive all rendered images onto a single CD in DICOM 3 compatible format.

Include:

- Patient Name: (First and Last)
- Surgeon Name (Last)
- Operative Side (L,R or Bi)
- Gender (M or F)
- Date of Surgery xx/xx/xxxx

CT Mako Knee

Updated 05/05/24
Reviewed 05/15/25

Indications - pre surgical evaluation for knee joint replacement.
Bill under CT LE w/o Contrast charge. Do not include separate hip, knee and ankle charges.

GENERAL SCAN NOTES

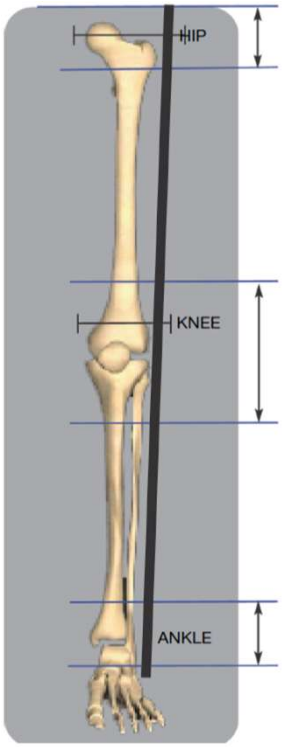
Move the patient's arms over his/her head if possible. Remove any metal from the imaging field of view.
Patient positioning:

- Patient in supine position feet first with both knees and ankles aligned.
- Elevate the knee of interest slightly with a rolled towel or blanket.
- Motion rod should be placed along lateral aspect of leg.
- Wrap the Velcro strap one complete revolution around the rod.
- Do not allow patient movement between or during the scans.

Topogram - iliac crests through feet.
Craniocaudal scan coverage (see image below):

- Hip - above femoral head to lesser trochanter of femur. FOV must be <500 mm.
- Knee - 10 cm above knee joint to 10 cm below knee joint. FOV must be <250 mm.
- Ankle - few centimeters above ankle joint through bottom of talus. FOV must be <500 mm.
- Matrix must be 512 x 512 squared.

IV Contrast: not given for this protocol.
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.
Prepare an uncompressed DICOM disc containing all images (without DICOM viewer).



Craniocaudal Scan Coverage

Metal Rod Placement

CT Mako Knee

SIEMENS PARAMETERS & RECONS

For **Hip**, **Knee** and **Ankle** scans:

	Scan Mode	kV	mAs	Care Dose	Care kV & Lvl	Pitch	Acq	Coll	Rot Time
Sensation 16	spiral	120	200	on	NA	0.80	16	0.75	0.5
Go Up 32	spiral	130	200	on	on 170	0.80	32	0.7	1.0
Sensation 64	spiral	120	200	on	NA	0.90	64	0.6	0.5
Definition 64	spiral	120	200	on	on	0.80	64	0.6	1.0
Go Top 64	spiral	120	200	on	on 170	0.80	64	0.6	1.0
Drive 128	spiral	120	200	on	on	0.80	128	0.6	1.0
Force 192	spiral	120	200	on	on	0.80	192	0.6	1.0

HIP RECONS

Name of Series	Thick	Interval	Kernel	Window	IR Lvl	Recon Direction	
AX HIP BONE	**3.0**	**3.0**	**Br59 / B60**	**bone/osteo**	**3**	**head/feet**	**Mako specific recon.**
COR HIP BONE	3.0	3.0	Br59 / B60	bone/osteo	3	front/back	
SAG HIP BONE	3.0	3.0	Br59 / B60	bone/osteo	3	left/right	

KNEE RECONS

AX KNEE BONE	3.0	3.0	Br59 / B60	bone/osteo	3	head/feet	
COR KNEE BONE	3.0	3.0	Br59 / B60	bone/osteo	3	front/back	
SAG KNEE BONE	3.0	3.0	Br59 / B60	bone/osteo	3	left/right	
AX KNEE THINS	**0.75**	**0.75**	**Br59 / B60**	**bone/osteo**	**3**	**head/feet**	**Mako specific recon.**

ANKLE RECONS

Name of Series	Thick	Interval	Kernel	Window	IR Lvl	Recon Direction	
AX ANKLE BONE	**3.0**	**3.0**	**Br59 / B60**	**bone/osteo**	**3**	**head/feet**	**Mako specific recon.**
COR ANKLE BONE	3.0	3.0	Br59 / B60	bone/osteo	3	front/back	
SAG ANKLE BONE	3.0	3.0	Br59 / B60	bone/osteo	3	left/right	

CT Mako Knee

GE PARAMETERS & RECONS

For **Hip**, **Knee** and **Ankle** scans:

	Scan Type	SFOV	kV	mA Range	Noise Index	Smart mA	Slice Thick	Beam Coll	Pitch	Speed	Rot Time	Dose Red	ASIR
LS 16	helical	large	120	100-440	12.50	on	2.5	10	0.938	9.37	0.5	NA	NA
Opt 540	helical	large	120	100-440	12.50	on	2.5	10	0.938	9.37	0.5	NA	NA
LS VCT 64	helical	large body	120	100-450	16.00	on	2.5	40	0.984	39.37	0.5	20	20
Disc VCT 64	helical	large body	120	100-450	16.00	on	2.5	40	0.984	39.37	0.5	20	20

HIP RECONS

Name of Series	Thickness	Interval	Recon Algorithm/Mode	Window Width/Level	Recon Direction	
AX HIP BONE	**2.5**	**2.5**	**bone full**	**2500/480**	**head/feet**	**Must be first recon.**
COR HIP BONE	2.5	2.5	bone full	2500/480	front/back	
SAG HIP BONE	2.5	2.5	bone full	2500/480	left/right	**Mako specific recon.**

KNEE RECONS

AX KNEE BONE	2.5	2.5	bone full	2500/480	head/feet	**Must be first recon.**
COR KNEE BONE	2.5	2.5	bone full	2500/480	front/back	
SAG KNEE BONE	2.5	2.5	bone full	2500/480	left/right	
AX KNEE THINS	**0.625**	**0.625**	**bone plus full**	**2500/480**	**head/feet**	**Mako specific recon.**

ANKLE RECONS

AX ANKLE BONE	**2.5**	**2.5**	**bone full**	**2500/480**	**head/feet**	**Must be first recon.**
COR ANKLE BONE	2.5	2.5	bone full	2500/480	front/back	**Mako specific recon.**
SAG ANKLE BONE	2.5	2.5	bone full	2500/480	left/right	

CT Mako Knee

PHILIPS PARAMETERS & RECONS

For **Hip**, **Knee** and **Ankle** scans:

	Scan Mode	kV	Avg mAs	Dose Index	3D Dose	Pitch	Detect	Colli	Rot Time	Scan Time
Incisive 128	helical	120	285	29	**off**	1.00	64	0.625	0.75	5.6

HIP RECONS

Name of Series	Thick	Interval	Filter	Window	iDose	Recon Direction	
AX HIP BONE	**3.0**	**3.0**	**YC**	**bone**	**3**	**head/feet**	**Mako specific recon.**
COR HIP BONE	3.0	3.0	YC	bone	3	front/back	
SAG HIP BONE	3.0	3.0	YC	bone	3	left/right	

KNEE RECONS

AX KNEE BONE	3.0	3.0	YC	bone	3	head/feet	
COR KNEE BONE	3.0	3.0	YC	bone	3	front/back	
SAG KNEE BONE	3.0	3.0	YC	bone	3	left/right	
AX KNEE THINS	**0.75**	**0.75**	**YC**	**bone**	**3**	**head/feet**	**Mako specific recon.**

ANKLE RECONS

AX ANKLE BONE	**3.0**	**3.0**	**YC**	**bone**	**3**	**head/feet**	**Mako specific recon.**
COR ANKLE BONE	3.0	3.0	YC	bone	3	front/back	
SAG ANKLE BONE	3.0	3.0	YC	bone	3	left/right	

1. KNEE SCAN PARAMETERS

Position/Landmark	Supine, Feet First
Topogram (Scout) Direction	Cranio-Caudal. AP and Lateral scout
kVp **mA (*if available)** **Pitch**	120-140kV (recommended 120 kVp) Auto Exposure Control* (200-400 mA) 1:1 (no gaps)
Helical Set Slice Thickness, Spacing, Algorithm	**Region** — **Thickness** — **Spacing** — **Algorithm** Hip — 2-5 mm — 2-5 mm — Bone Knee — 0.5-1 mm — 0.5-1 mm — Bone Ankle — 2-5 mm — 2-5 mm — Bone
Image Resolution Matrix	512 x 512 Matrix: Image must be a square
DFOV	Hip=500 mm, Knee=250 mm, Ankle=500 mm Do not exceed limits.
Scan Plan	Scan in the Axial plane, for all 3 regions (Hip, Knee, and Ankle)
Scan Start/End Locations	Begin scan at the Hip, through the Knee, ending at and including the Ankle joint.
Hip Region	Include the entire femoral head and motion rod. Center around the femoral head.
Knee Region	Scan a region a minimum of 10 cm above and 10 cm below the distal femoral condyles. Include margin above the patellofemoral joint, margin below the distal boundary of the tibial tuberosity, and the motion rod. Center around the joint line.
Ankle Region	Include the medial and lateral malleoli and motion rod. Center around the ankle joint.
Images required for transfer	Transfer all Axial bone images of the Hip, Knee, and Ankle including the AP Topogram in DICOM format, to PACS or CD.

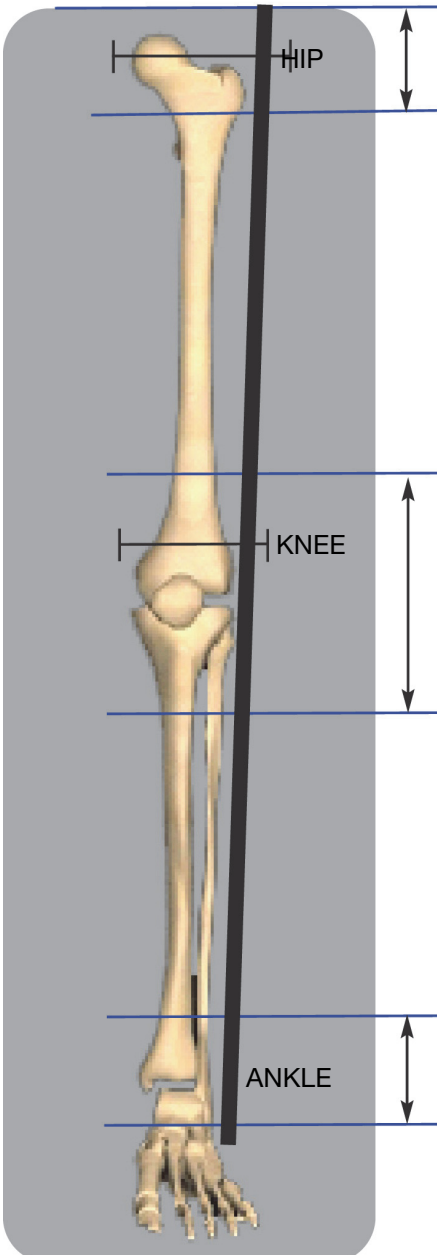


Figure. 1. Scan Location and Characteristics

2. POSITIONING THE PATIENT

During the scan, the pelvis, leg, and Motion Rod must remain motionless.

1. Position patient supine, feet first with foot secured in an upright position with a rolled towel or blanket wrapped around the bottom of the foot to secure the ankle as shown.

2. Elevate the knee of the patient slightly with a rolled towel or blanket.

3. Wrap the velcro strap one complete revolution around the rod as shown in Figure 2. Do this for both Velcro straps, one at the hip position and one at the ankle position as shown.

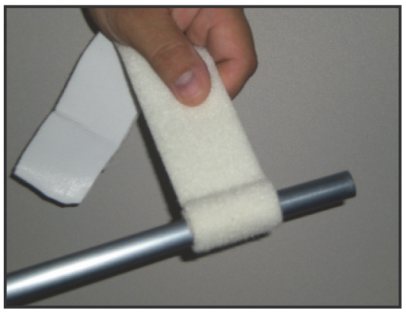


Figure 2.

4. Set the Motion Rod on the patient to pass from just proximal of Hip Center to distal of Ankle Center as shown in Figure 3.

5. Adjust the femoral and tibial straps to secure the rod.

6. Verify the rod is in both anterior/posterior and medial/lateral field of views for all scan regions.

The velcro strap must be wrapped around the rod in one complete revolution, before wrapping around the leg. Straps should be snug, but not excessively tight.

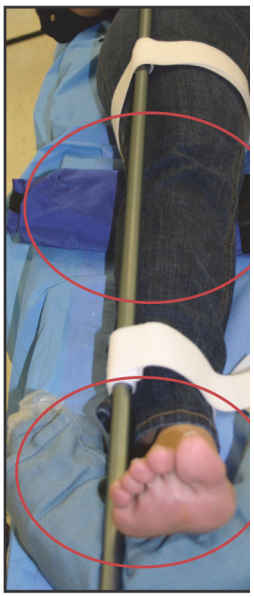


Figure 3.

3. CONSIDERATIONS

- Scan patient anytime before procedure (up to 8 weeks in advance)
- Ensure the patient is comfortable and relaxed. This is critical for achieving a motionless scan
- If metallic components are present in the operative leg, it may not be possible to obtain an image of significant quality to support a Mako procedure. If metal components are present in the non-operative leg (e.g. knee components), attempt to isolate the non-operative leg from the scan region.

4. POST SCAN EXAMINATION

The Physician and CT Technologist should verify the following:

- Patient's orientation is correct
- Regions of interest in Figure 1 are visible in dataset
- Scan includes complete femoral head, knee joint and ankle joint
- Image Slice thickness and FOV is correct
- Motion Rod is visible and complete (full circle is present) in all slices
- Bone images in scan image are not degraded by metal-induced artifacts

5. DATA SET TRANSFER

Archive all acquired images onto single CD in DICOM 3 compatible format

Do not include DICOM viewer

PN 200004 Rev 11 01/16

CT Zimmer Knee

Updated 05/05/24
Reviewed 05/15/25

Indications - pre surgical evaluation prior to knee joint replacement.
Bill under CT LE w/o Contrast charge. Do not include separate hip, knee and ankle charges.

GENERAL SCAN NOTES

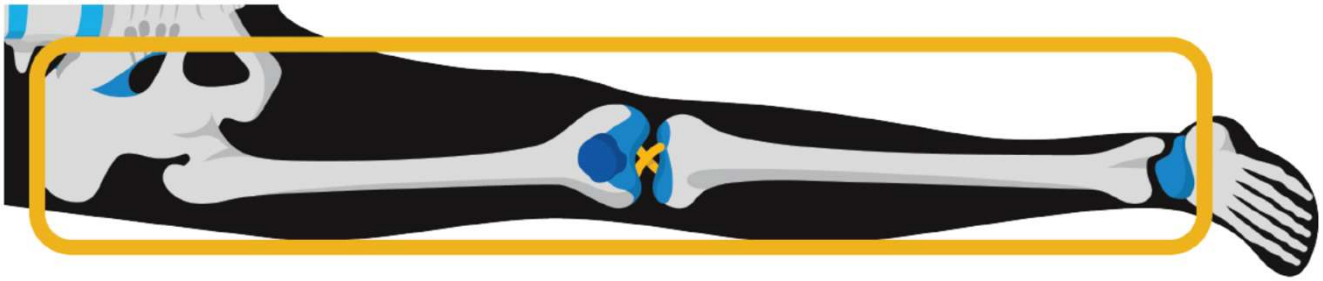
Move the patient's arms over his/her head if possible. Remove any metal from the imaging field of view.
Patient positioning:

- Patient in supine position feet first with knees extended and toes pointing straight up.
- Elevate contralateral leg if prosthesis present to minimize streak artifact.
- Do not allow patient movement between or during the scans.

Topogram - iliac crests through feet.
Craniocaudal scan coverage (see image below):

- 3 cm above hip joint through bottom of talus.
- FOV must be ≤250 mm (up to 320 mm if bilateral) and matrix must be 512 x 512 squared.
- If bilateral cannot fit in FOV <320 mm, scan with FOV of 500 mm and recon each leg at 250 mm.
- Only bones have to be included in FOV (soft tissues do not have to be included).

IV Contrast: not given for this protocol.
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.
Prepare an uncompressed DICOM disc containing only axial soft tissue images (do not send coronal and sagittal recons).
Zimmer Customer Support: 800-348-2759.



Craniocaudal Scan Coverage

CT Zimmer Knee

SIEMENS PARAMETERS & RECONS

	Scan Mode	kV	mAs	Care Dose	Care kV & Lvl	Pitch	Acq	Coll	Rot Time
Sensation 16	spiral	120	200	on	NA	0.80	16	0.75	0.5
Go Up 32	spiral	130	109	on	on 170	0.80	32	0.7	1.0
Sensation 64	spiral	120	200	on	NA	0.90	64	0.6	0.5
Definition 64	spiral	120	190	on	on	0.80	64	0.6	1.0
Go Top 64	spiral	120	131	on	on 170	0.80	64	0.6	1.0
Drive 128	spiral	120	133	on	on	0.80	128	0.6	1.0
Force 192	spiral	120	133	on	on	0.80	192	0.6	1.0

Name of Series	Thick	Interval	Kernel	Window	IR Lvl	Recon Direction
AX SOFT	**1.5**	**0.75**	**Br40 / B31f**	**abdomen**	**3**	**head/feet**
AX BONE	3.0	3.0	Br59 / B60f	bone/osteo	3	head/feet
COR BONE	3.0	3.0	Br59 / B60f	bone/osteo	3	front/back
SAG BONE	3.0	3.0	Br59 / B60f	bone/osteo	3	left/right

Zimmer specific recon.

Only the axial soft tissue images are sent to Zimmer.

GE PARAMETERS & RECONS

	Scan Type	SFOV	kV	mA Range	Noise Index	Smart mA	Slice Thick	Beam Coll	Pitch	Speed	Rot Time	Dose Red	ASIR
LS 16	helical	large	120	100-440	27.00	on	1.25	20	1.375	27.50	0.5	NA	NA
Opt 540	helical	large	120	100-440	27.00	on	1.25	20	1.375	27.50	0.5	NA	NA
LS VCT 64	helical	large body	120	120-450	16.26	on	1.25	40	0.984	39.37	0.5	30	70
Disc VCT 64	helical	large body	120	100-700	20.00	on	1.25	40	0.984	39.37	0.8	NA	NA

Name of Series	Thickness	Interval	Recon Algorithm/Mode	Window Width/Level	Recon Direction
AX SOFT	**1.25**	**0.625**	**std full**	**400/40**	**head/feet**
AX BONE	2.5	2.5	bone full	2500/480	head/feet
COR BONE	2.5	2.5	bone full	2500/480	front/back
SAG BONE	2.5	2.5	bone full	2500/480	left/right

Must be first recon.

Zimmer specific recon.

Only the axial soft tissue images are sent to Zimmer.

CT Zimmer Knee

PHILIPS PARAMETERS & RECONS

	Scan Mode	kV	Avg mAs	Dose Index	3D Dose	Pitch	Detect	Colli	Rot Time
Incisive 128	helical	120	103	20	on	0.80	64	0.625	0.75

Name of Series	Thick	Interval	Filter	Window	iDose	Recon Direction
AX SOFT	**1.5**	**0.75**	**B**	**abdomen**	**3**	**head/feet**
AX BONE	3.0	3.0	YC	bone	3	head/feet
COR BONE	3.0	3.0	YC	bone	3	front/back
SAG BONE	3.0	3.0	YC	bone	3	left/right

Zimmer specific recon.

Only the axial soft tissue images are sent to Zimmer.

Purpose and Summary

This CT protocol is applicable for the Zimmer Biomet PSI and Signature Total Knee Guides* manufactured by Materialise. Zimmer Biomet cannot be held liable for other possible subsequent uses (i.e. diagnostic uses).

The scan protocol is created to obtain all relevant clinical data of the anatomical structures of the patient's knee, as well as the overall alignment of the entire limb. The resulting scans of this sequence will be used to create 3-dimensional virtual anatomical models, a personalized surgical plan and surgical guides of the patient's knee prior to knee arthroplasty surgery.

General Scan Requirements

- This protocol is intended for **16-slice** scanners or higher.

Patient Preparation

- Discuss the procedure with the patient. Make sure they understand the table will move during scanning.
- Remove any non-fixed metal prosthesis, jewelry, zippers, etc. that might interfere with the imaging region.
- Position the patient to maximize comfort and minimize motion.
- The patient must not move during any part of the scanning sequence. Patient movement will alter the relative alignment of the joints and invalidate the scan.

Patient Positioning

- Position the patient feet first, supine. Toes should be pointing up.
- Ensure the ankle is scanned on the same plane or slightly lower than the knee joint: the protocol allows for up to a 20 degree flexion of the knee joint.
- The knee can be rotated up to 20 degrees to allow for patient comfort.
- If an implant is present in the contralateral leg, elevate the contralateral knee to prevent the artifact from affecting the surgical side.

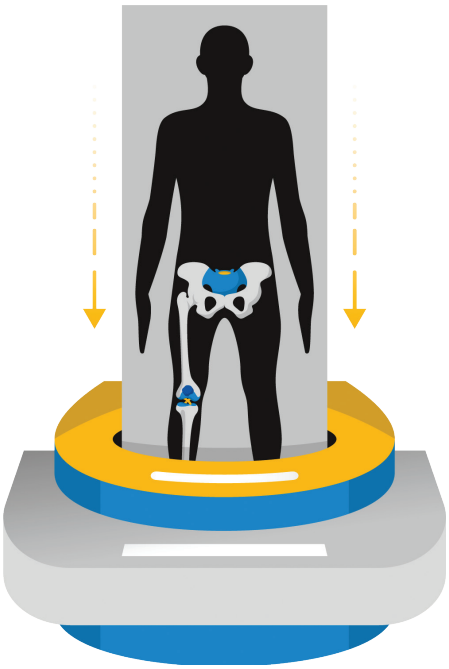
Imaging Guidelines

- Execute sagittal and coronal localizers from the anterior superior iliac spine through the calcaneus.
- When scanning the series, do not re-landmark. Laser light on first scan only.
- Only true axial will be accepted: **NO OBLIQUE**
- Do not use gantry tilt
- Use manufacturer's defaults for parameters not listed
- Use the smallest FOV possible to capture the whole required bone regions. This will require careful alignment of the leg to capture the femoral head, knee, and talus.
- Capturing all soft tissue is not necessary, only the bony regions are of interest.

For Bilateral Scans

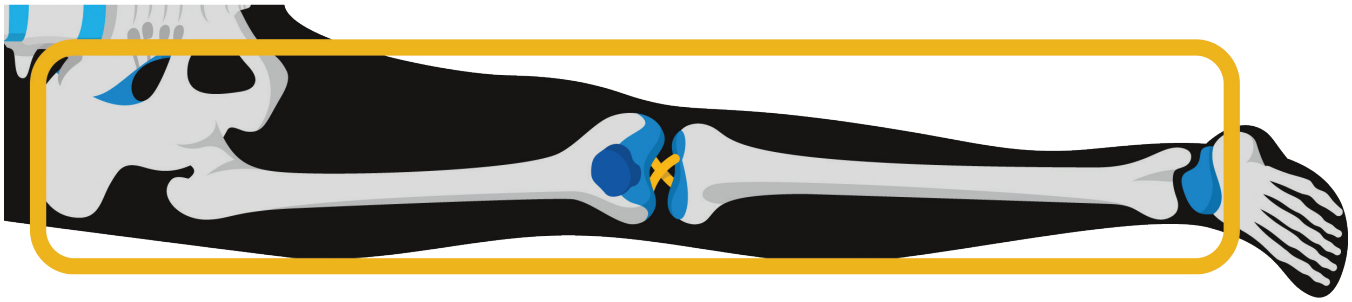
- Maximum FOV allowed for bilateral scans is 320 mm
- If both legs cannot be captured in 320 mm FOV, acquire at 500 mm FOV and reconstruct individual limbs at 250 mm FOV.
- Scan both legs simultaneously, while still following the above guidelines.

Note: Unilateral images are recommended unless the patient is scheduled for a bilateral knee replacement.



Option 1: Full Leg
(Single Acquisition)

Scan entire limb from anterior superior iliac spine through mid-calcaneus on the surgical side.

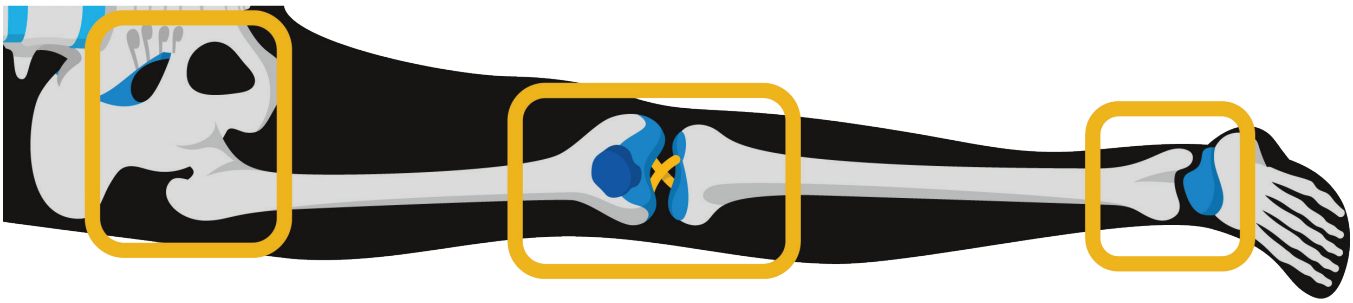


Collimation	*Slice thickness:* 1.5 mm or smaller | *Slice increment:* 50% overlap
Field of View	250 mm or smaller (<320 mm for bilateral scans)
Matrix	512 x 512
Algorithm	Moderate, standard, or soft tissue algorithm with no edge enhancement | Do not use bone algorithm
Pitch	1 or smaller
kVp and mAs	*kVp:* 90-140 | *mAs:* as given by automatic tube current modulation **Adjust depending on patient body habitus and the presence of metal in scan region.**

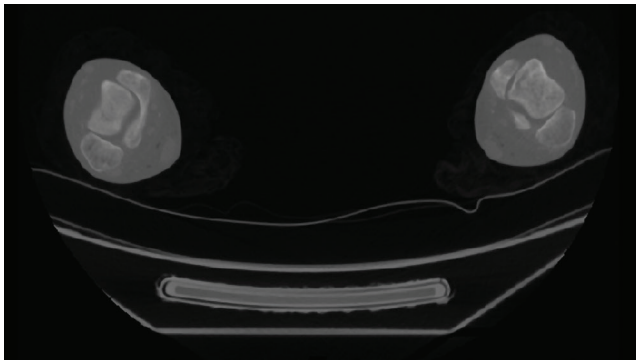
Option 2: Three Region
(Sectional Acquisition)

Scan each lower joint from the surgical side. The minimum scanning volumes required for each scan are as follows:

- Ankle scan to cover the malleoli
- Knee scan to cover at least 100 mm above and 100 mm below the joint, to include the patellar ligament attachment at the tibial tubersoity.
- Hip scan to cover the femoral head and neck



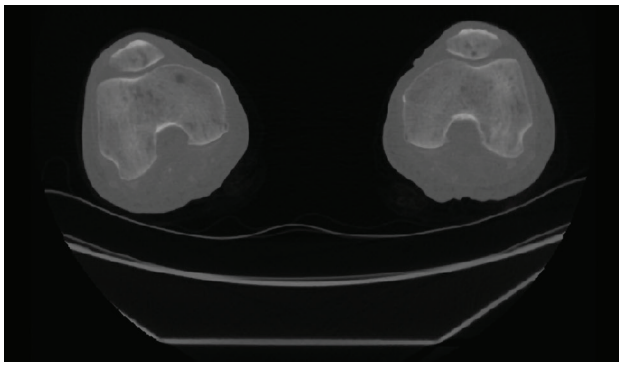
Scan region 1: Ankle



Note: Example images are bilateral, scanned at a 320 mm FOV.

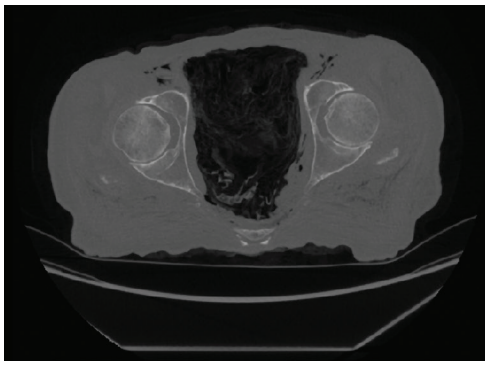
Region of interest	20 mm above and below the ankle joint, to include the malleoli and talus
Collimation	*Slice thickness:* 1.5 mm or smaller | *Slice increment:* Contiguous slices
Field of View	250 mm or smaller (<320 mm for bilateral scans)
Matrix	512 x 512
Algorithm	Moderate, standard, or soft tissue algorithm with no edge enhancement | Do not use bone algorithm
Pitch	2 or smaller
kVp and mAs	*kVp:* 90 | *mAs:* as given by automatic tube current modulation **Adjust depending on patient body habitus and the presence of metal in scan region.**

Scan region 2: Knee



Region of interest	100 mm above and below the knee joint
Collimation	*Slice thickness:* 1.5 mm or smaller | *Slice increment:* 50% overlap
Field of View	250 mm or smaller (<320 mm for bilateral scans)
Matrix	512 x 512
Algorithm	Moderate, standard, or soft tissue algorithm with no edge enhancement | Do not use bone algorithm
Pitch	1 or smaller
kVp and mAs	*kVp:* 90-140 | *mAs:* as given by automatic tube current modulation **Adjust depending on patient body habitus and the presence of metal in scan region.**

Scan region 3: Hip



Region of interest	Entire femoral head and neck
Collimation	*Slice thickness:* 1.5 mm or smaller | *Slice increment:* Contiguous slices
Field of View	250 mm or smaller (<320 mm for bilateral scans)
Matrix	512 x 512
Algorithm	Moderate, standard, or soft tissue algorithm with no edge enhancement | Do not use bone algorithm
Pitch	2 or smaller
kVp and mAs	*kVp:* 90 | *mAs:* as given by automatic tube current modulation **Adjust depending on patient body habitus and the presence of metal in scan region.**

Submitting the Images

- Only DICOM format will be accepted
- No .jpg images or other formats are acceptable
- Do not submit reconstructed or reformatted images.
- Only original scan data is acceptable.
- Uncompressed Dicom data is required for processing.
- Lossy and other forms of compression are not recommended
- The scanner should be set to DICOM format “raw image,” with no compression.
  If loading from PACs, import and export the scan as DICOM files with the uncompressed option.

CT Conformis Knee

Updated 05/05/24
Reviewed 05/15/25

Indications - pre surgical evaluation prior to knee joint replacement.
Bill under CT LE w/o Contrast charge. Do not include separate hip, knee and ankle charges.

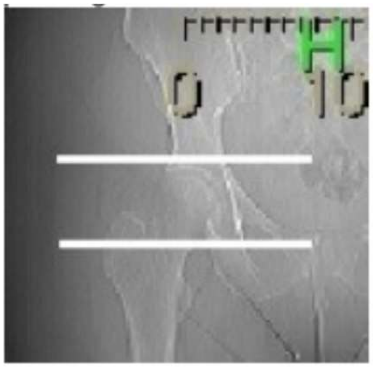
GENERAL SCAN NOTES

Remove any metal from the imaging field of view.
Patient positioning:
- Patient in supine position feet first with knees extended and toes pointing straight up.
- Elevate contralateral leg if prosthesis present to minimize streak artifact.
- Do not allow patient movement between or during the scans.

Topogram - iliac crests through feet.
Craniocaudal scan coverage (see images below):
- Hip - acetabulum through bottom of femoral head. FOV 250-300 mm.
- Knee - distal third of femur through proximal half of tibia. FOV 200-250 mm.
- Ankle - 2 cm above to 2 cm below ankle joint. FOV 150-200 mm.

IV Contrast: not given for this protocol.
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.
Prepare an uncompressed DICOM disc containing all images.

Knee CC Coverage



Hip CC Coverage

Ankle CC Coverage

CT Conformis Knee

SIEMENS PARAMETERS & RECONS

For **Hip** scan:

	Scan Mode	kV	mAs	Care Dose	Care kV & Lvl	Pitch	Acq	Coll	Rot Time
Sensation 16	spiral	120	200	on	NA	0.80	16	0.75	0.5
Go Up 32	spiral	130	109	on	on 170	0.80	32	0.7	1.0
Sensation 64	spiral	120	200	on	NA	0.90	64	0.6	0.5
Definition 64	spiral	120	190	on	on	0.80	64	0.6	1.0
Go Top 64	spiral	120	131	on	on 170	0.80	64	0.6	1.0
Drive 128	spiral	120	133	on	on	0.80	128	0.6	1.0
Force 192	spiral	120	133	on	on	0.80	192	0.6	1.0

For **Knee** and **Ankle** scans:

	Scan Mode	kV	mAs	Care Dose	Care kV & Lvl	Pitch	Acq	Coll	Rot Time
Sensation 16	spiral	120	140	on	NA	0.55	16	0.75	1.0
Go Up 32	spiral	Sn 110	366	on	on 75	0.40	32	0.7	1.0
Sensation 64	spiral	120	140	on	NA	0.90	64	0.6	1.0
Definition 64	spiral	120	100	on	**off**	0.80	64	0.6	1.0
Go Top 64	spiral	Sn 110	898	on	on	0.40	64	0.6	1.0
Drive 128	spiral	120	70	on	**off**	0.80	128	0.6	1.0
Force 192	spiral	120	70	on	**off**	0.80	192	0.6	1.0

HIP RECONS

Name of Series	Thick	Interval	Kernel	Window	IR Lvl	Recon Direction
AX HIP BONE	2.0	2.0	Br59 / B60	bone/osteo	3	head/feet

KNEE RECONS

AX KNEE BONE	1.0	0.5	Br59 / B60	bone/osteo	3	head/feet
COR KNEE BONE	1.0	1.0	Br59 / B60	bone/osteo	3	front/back
SAG KNEE BONE	1.0	1.0	Br59 / B60	bone/osteo	3	left/right

ANKLE RECONS

AX ANKLE BONE	2.0	2.0	Br59 / B60	bone/osteo	3	head/feet

CT Conformis Knee

GE PARAMETERS & RECONS

For **Hip** and **Ankle** scans:

	Scan Type	SFOV	kV	mA Range	Noise Index	Smart mA	Slice Thick	Beam Coll	Pitch	Speed	Rot Time	Dose Red	ASIR
LS 16	helical	large	120	100-440	12.50	on	2.5	10	0.938	9.37	0.5	NA	NA
Opt 540	helical	large	120	100-440	12.50	on	2.5	10	0.938	9.37	0.5	NA	NA
LS VCT 64	helical	large body	120	100-450	16.00	on	2.5	40	0.984	39.37	0.5	20	20
Disc VCT 64	helical	large body	120	100-450	16.00	on	2.5	40	0.984	39.37	0.5	20	20

For **Knee** scan:

	Scan Type	SFOV	kV	mA Range	Noise Index	Smart mA	Slice Thick	Beam Coll	Pitch	Speed	Rot Time	Dose Red	ASIR
LS 16	helical	large	120	100-440	17.68	on	1.25	10	0.938	9.37	0.5	NA	NA
Opt 540	helical	large	120	100-440	17.68	on	1.25	10	0.938	9.37	0.5	NA	NA
LS VCT 64	helical	large body	120	100-450	22.63	on	1.25	40	0.984	39.37	0.5	20	20
Disc VCT 64	helical	large body	120	100-450	22.63	on	1.25	40	0.984	39.37	0.5	20	20

HIP RECONS

Name of Series	Thickness	Interval	Recon Algorithm/Mode	Window Width/Level	Recon Direction	
AX HIP BONE	**2.5**	**2.5**	**bone full**	**2500/480**	**head/feet**	**Must be first recon.**

KNEE RECONS

AX KNEE BONE	**1.25**	**0.625**	**bone full**	**2500/480**	**head/feet**	**Must be first recon.**
COR KNEE BONE	0.625	0.625	bone plus full	2500/480	front/back	
SAG KNEE BONE	0.625	0.625	bone plus full	2500/480	left/right	

ANKLE RECONS

AX ANKLE BONE	**2.5**	**2.5**	**bone full**	**2500/480**	**head/feet**	**Must be first recon.**

CT Conformis Knee

PHILIPS PARAMETERS & RECONS

For **Hip**, **Knee** and **Ankle** scans:

	Scan Mode	kV	Avg mAs	Dose Index	3D Dose	Pitch	Detect	Colli	Rot Time
Incisive 128	helical	120	103	20	on	0.80	64	0.625	0.75

HIP RECONS

Name of Series	Thick	Interval	Filter	Window	iDose	Recon Direction
AX HIP BONE	2.0	2.0	YC	bone	3	head/feet

KNEE RECONS

AX KNEE BONE	1.0	0.5	YC	bone	3	head/feet
COR KNEE BONE	1.0	1.0	YC	bone	3	front/back
SAG KNEE BONE	1.0	1.0	YC	bone	3	left/right

ANKLE RECONS

AX ANKLE BONE	2.0	2.0	YC	bone	3	head/feet

Introduction:

Patients who present with an order for a CT Scan of the lower extremity following Conformis protocol are being considered as a candidate for one of the Conformis Inc. knee implants. These are customized implants designed from CT scans.

TABLE OF CONTENTS

All questions regarding this protocol reference guide should be addressed to:

Conformis Imaging Support
600 Technology Park Drive
Billerica, MA 01821
Tel: 781-345-9170
Email: imaging-support@conformis.com

Conformis Imaging Support is available:
Monday-Friday
8:00 am – 6:00 pm (Eastern Time)

Medical Device Safety Service, GMBH
Schiffgraben 41
30175 Hannover, Germany
Tel: +49(511)6262-8630

CE 0086

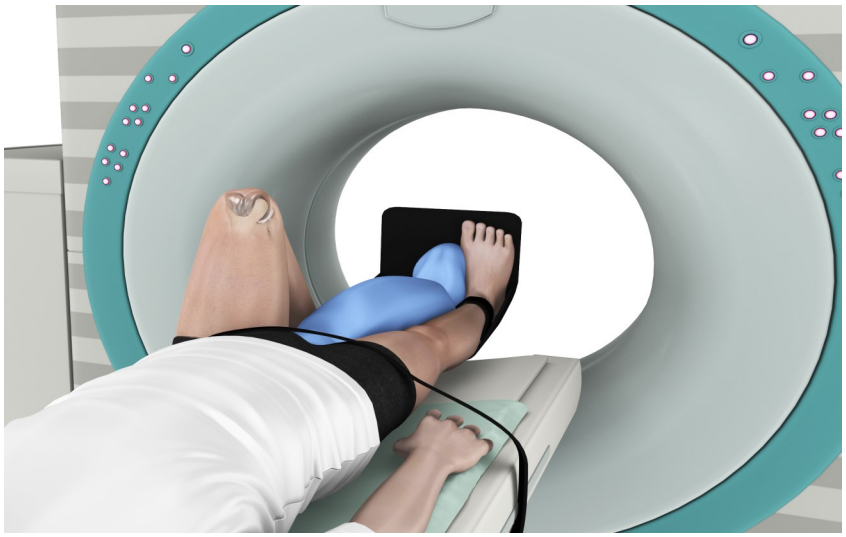
1.0 Patient Position:

To ensure our ability to correct for malalignment position the extremity of interest with the foot perpendicular to the table and with the toes pointing straight up. While some patients may not be able to be placed exactly as described please position them as closely as possible to the desired orientation. Immobilize the legs and toes to prevent motion. The use of positioning aids is encouraged. It is best not to place a sponge or pillow beneath the knee or ankle of interest. Instruct the patient to hold very still during the scan acquisition. Ensure that no foreign objects are in the scan field.

The use of a solid, firm positioning aid (as depicted by the black board in the images on this page) is recommended to help immobilize the feet and legs to prevent motion during the scan. There are many common objects that can be used for this purpose.

IMMOBILIZATION IS ESSENTIAL

*** *When an implant or other device is present in the opposite knee, please make every effort to position that knee flexed and out of the FOV to reduce the artifacts in the affected knee joint. Please do so before acquiring any of the study images. If available please use a metal artifact reduction technique.* ***



2.0 Image Acquisition:

The patient's first and last name data in the DICOM header
MUST reflect the patient's legal name associated with supporting documentation
(ex: license or insurance card)

From the full leg scout scan the hip, knee and ankle images in a single acquisition following the protocol outlined in the graph on page 4.

Series 1: Full leg scout from the hip through the ankle
Series 2: Hip, Knee, Ankle
Series 3: Coronal MPR Knee
Series 4: Sagittal MPR Knee

Please note: It is acceptable to scan the Hip, Knee and Ankle in separate series but Conformis strongly suggests scanning them as a single series to help reduce the chance of patient motion.

Although the knee is of primary interest, limited images of the hip and ankle are required to ensure appropriate alignment of the personalized implant. The axial reconstruction parameters are to be followed as closely as possible as permitted by your specific CT system's capabilities.

Displayed Field Of View (DFOV) on all series should be limited to only the affected side. Approximate FOV ranges for the hip are 25-30cm, knee 20-25cm, and ankle 15-20cm. Check the images to make sure that all the anatomy is included. If necessary please reconstruct any series with appropriate centering to recover missing anatomy.

Protocol Build, We recommend building a Conformis protocol in your CT scanner(s) with all of the appropriate ranges.

KV/MaS Settings should be set at your standard setting for each of the anatomic ranges to be scanned. Conformis suggests employing dose reduction techniques whenever possible.

Bilateral Imaging—To reduce radiation exposure bilateral imaging should be accomplished in a single acquisition with separate reconstructions of each leg.

***Before the patient leaves the scan table, please review all images to ensure that there is no motion and that the patient did not change position during the scan.

If motion and/or positional changes are detected, all series (hip, knee and ankle) should be reacquired.***

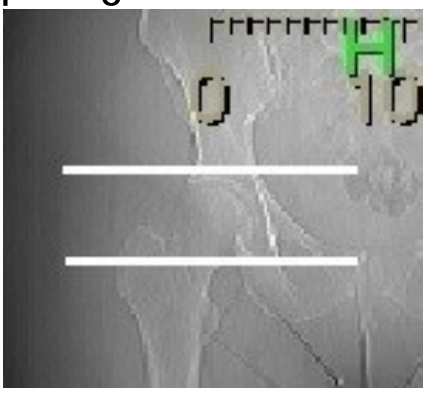
Conformis Protocol for CT of the Lower Extremity

Series	**All scans should be acquired in the helical/spiral mode, pitch as close to 1:1 as possible, using the body filter (50 cm SFOV). From the full leg scout the hip, knee and ankle images can be acquired in a single scan acquisition. Then provide reconstructed series in the coronal and sagittal planes of the knee. Send <u>all</u> images that are acquired including the scout and dose page.**			
1	*Scout*	*FULL LEG, Hip through Ankle*		
		Kernel / Algorithm	Reconstruction Thickness X Increment (table increment should not exceed slice thickness)	Projection
2	**Hip** – Femoral head only (acetabulum only)	Bone	2mm X 2mm or 2.5mm X 2.5mm	Axial
2	**Knee** – distal 1/3 of the femur through proximal 1/2 of tibia *(should include the entire patella through midpoint of the lower leg)*	Bone	1mm X .5mm or 1.25mm X .625mm	Axial
2	**Ankle** – center at tibiotalar joint space scan 2cm above the joint to 2cm below	Bone	2mm X 2mm or 2.5mm X 2.5mm	Axial
3	**Multi Planar Reformat**– knee only	Bone	1mm X 1mm	Coronal
4	**Multi Planar Reformat**– knee only	Bone	1mm X 1mm	Sagittal

Note: The imaging protocol described in this manual is only for the purpose of providing information needed by Conformis to generate the personalized implant design. It might differ from knee imaging protocols routinely used by your institution for diagnostic purposes and might not provide the same information. The responsible radiologist should decide whether additional scans from your routine diagnostic protocol should be added to the exam to provide any additional information.

Scout

Hip Range

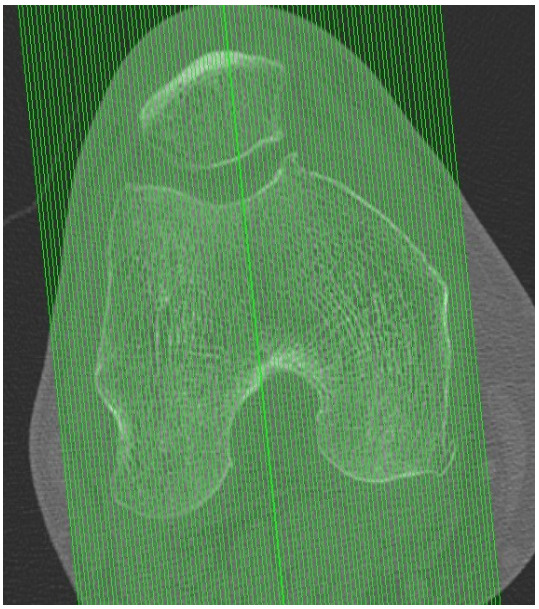


Knee Range

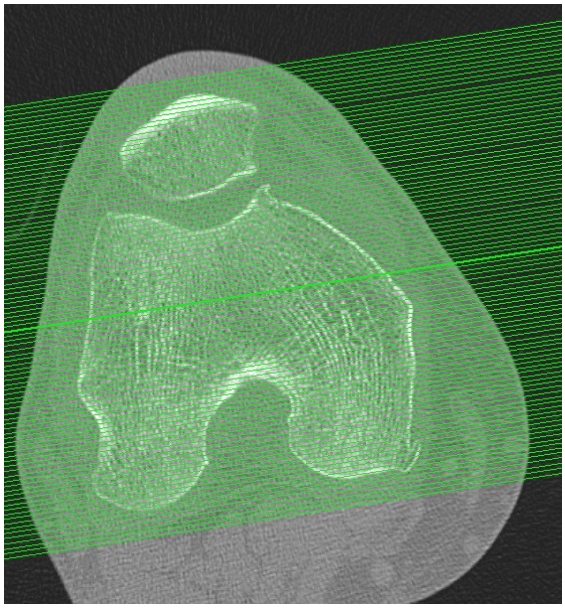
Ankle Range

Knee MPR: Sagittal and Coronal

Sagittal MPR
Perpendicular to femoral condyles



Coronal MPR
Parallel to femoral condyles



3.0 Image Archive

Important: Your site **must** keep a permanent archive (PACS) copy of the CT exams. We also encourage you to protect the the raw data for as long as possible.

4.0 Image Data Transfer:

******It is critical that Conformis protocol scans are sent immediately upon completion of the exam via electronic upload whenever possible to ensure the best possible care for the patient.******

There are several methods of image transfer available for Conformis protocol scans. Prior to transmitting, ensure that your DICOM data file is complete, containing the scout, the dose page and all images and series aquired for the patient.

4.1 Secure Web Upload:

Conformis scans can be uploaded from a CD, DVD, or a web enabled PACS to our secure website. Go to https://www.conformis.info/scanupload/details.faces to upload a scan through our secure .ftp site.

** Requires the use of Java which is not supported by Google Chrome**

4.2 Secure DICOM transfer via Cloud Sharing Networks:

Conformis is able to retrieve images from cloud based image sharing sites. If you are currently using one of these types of applications or are interested in establishing a secure cloud connection please contact Conformis Image Support at 781-345-9170 to discuss establishing a connection.

4.3 Priority Shipping:

To ensure that the patient's images are received and reviewed as quickly as possible we strongly recommend the use of an electronic method of DICOM data transfer for Conformis protocol scans. However if you are unable to send studies electronically Conformis scans that have been saved in uncompressed or loss–less compression DICOM format on a disk (CD or DVD) can be shipped to Conformis. We provide pre-paid envelopes. To obtain a supply please email imaging-support@Conformis.com or visit http://www.Conformis.com/Imaging-Professionals/Request-CD-Mailers

CT DePuy Knee

Updated 05/05/24
Reviewed 05/15/25

Indications - pre surgical evaluation prior to knee joint replacement.
Bill under CT LE w/o Contrast charge. Do not include separate hip, knee and ankle charges.

GENERAL SCAN NOTES

Remove any metal from the imaging field of view.
Patient positioning:
Patient in supine position feet first with knees extended and toes pointing straight up.
Elevate contralateral leg if prosthesis present to minimize streak artifact.
Do not allow patient movement between or during the scans.
Topogram - iliac crests through feet.
Craniocaudal scan coverage - just above femoral head through just below talus.
Must use FOV 150-200 mm.
IV Contrast: not given for this protocol.
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.
Prepare an uncompressed DICOM disc containing axial soft tissue images and send to:

SIEMENS PARAMETERS & RECONS

	Scan Mode	kV	mAs	Care Dose	Care kV & Lvl	Pitch	Acq	Coll	Rot Time
Sensation 16	spiral	120	200	on	NA	0.80	16	0.75	0.5
Go Up 32	spiral	130	109	on	on 170	0.80	32	0.7	1.0
Sensation 64	spiral	120	200	on	NA	0.90	64	0.6	0.5
Definition 64	spiral	120	190	on	on	0.80	64	0.6	1.0
Go Top 64	spiral	120	131	on	on 170	0.80	64	0.6	1.0
Drive 128	spiral	120	133	on	on	0.80	128	0.6	1.0
Force 192	spiral	120	133	on	on	0.80	192	0.6	1.0

Name of Series	Thick	Interval	Kernel	Window	IR Lvl	Recon Direction	
AX BONE	3.0	3.0	Br59 / B60	bone/osteo	3	head/feet	
COR BONE	3.0	3.0	Br59 / B60	bone/osteo	3	front/back	
SAG BONE	3.0	3.0	Br59 / B60	bone/osteo	3	left/right	
AX SOFT	**0.75**	**0.7**	**Br40 / B31**	**abdomen**	**3**	**head/feet**	**DePuy specific recon.**

CT DePuy Knee

GE PARAMETERS & RECONS

	Scan Type	SFOV	kV	mA Range	Noise Index	Smart mA	Slice Thick	Beam Coll	Pitch	Speed	Rot Time	Dose Red	ASIR
LS 16	helical	large	120	100-440	19.09	on	2.5	20	1.375	27.50	0.5	NA	NA
Opt 540	helical	large	120	100-440	19.09	on	2.5	20	1.375	27.50	0.5	NA	NA
LS VCT 64	helical	large body	120	120-450	11.50	on	2.5	40	0.984	39.37	0.5	30	70
Disc VCT 64	helical	large body	120	100-700	14.14	on	2.5	40	0.984	39.37	0.8	NA	NA

Name of Series	Thickness	Interval	Recon Algorithm	Window Width/Level	Recon Direction	
AX BONE	**2.5**	**2.5**	**bone full**	**2500/480**	**head/feet**	**Must be first recon.**
COR BONE	2.5	2.5	bone full	2500/480	front/back	
SAG BONE	2.5	2.5	bone full	2500/480	left/right	
AX SOFT	**0.625**	**0.625**	**std full**	**400/40**	**head/feet**	**DePuy specific recon.**

PHILIPS PARAMETERS & RECONS

	Scan Mode	kV	Avg mAs	Dose Index	3D Dose	Pitch	Detect	Colli	Rot Time
Incisive 128	helical	120	103	20	on	0.80	64	0.625	0.75

Name of Series	Thick	Interval	Filter	Window	iDose	Recon Direction	
AX BONE	3.0	3.0	YC	bone	3	head/feet	
COR BONE	3.0	3.0	YC	bone	3	front/back	
SAG BONE	3.0	3.0	YC	bone	3	left/right	
AX SOFT	**0.75**	**0.7**	**B**	**abdomen**	**3**	**head/feet**	**DePuy specific recon.**

CPI
DePuy Orthopaedics, Inc.
700 Orthopaedic Drive
Warsaw, Indiana 46581-0988
(800) 689-0746

DePuy

Computed Tomography CT

Scanner Brand	Scanner Type	Scanner Specific Parameters		
		Recon Filter	Knee Slab Thickness/Spacing	Image Transfer Options
Siemens®	Sensation	B31s	0.6 mm	CD-R, DVD-R, MOD, PACS secure DICOM send
GE®	Lightspeed	STANDARD	0.625 mm	CD-R, MOD, PACS secure DICOM send
Philips®	Brilliance	B	0.6 mm OR 0.625 mm	CD-R, MOD, PACS secure DICOM send
Toshiba®	Aquilion	FC04	0.5 mm	MOD, DVD-RAM, CD-R, PACS secure DICOM send

Siemens® is a registered trademark of Siemens AG.
GE® is a registered trademark of General Electric Company.
Philips® is a registered trademark of Koninklijke Philips Electronics N.V..
Toshiba® is a registered trademark of Toshiba Corporation.

Frequently Asked Questions:

Q1: Are there special instructions if the patient has metal devices in the knee slab region?
A1: Yes, attempt to flex the contralateral knee as far as possible to place the metal artifact in slices outside of the knee articular region.

Q2: Can I shift the image center for each slab such that each joint is centered in the image?
A2: No, set the field of view (FOV) and image center based on the entire leg and just adjust the start and stop locations as necessary.

Q3: How should the physical image media (i.e. CD-R) be shipped to DePuy?
A3: Overnight. The surgeon and patient are counting on the delivery of the scan as soon as possible in order to meet the surgery date.

Q4: Should I be concerned about setting windowing for the project?
A4: If you have the ability to adjust the windowing, please use a soft tissue window such that the Hounsfield unit (HU) range is large.

Q5: Can I include significant overlap and thus extra slices in the project?
A5: No, follow the protocol as specified on the previous page with minimal or no overlap.

Q6: Can I scan the patient the patient in the prone position?
A6: Yes, if necessary due to patient limitations but be sure to label the orientation correctly in your scan and note the prone position on the disk.

CPI
DePuy Orthopaedics, Inc.
700 Orthopaedic Drive
Warsaw, Indiana 46581-0988
(800) 689-0746

DePuy

Also called True Net

Computed Tomography CT

Total Knee Replace

DePuy CPI Knee Scanning Protocol

This protocol is to ensure that an accurate 3-D model can be created by DePuy and used to design a patient specific knee instrument. Scan settings should be optimized to capture bony geometry and cartilage of the knee. The hip and ankle data is needed to align the entire leg for a total knee replacement. Review the following information before proceeding with the scanning process.

Scanning Procedure

- ***All data must be collected in same-center/size study(s), with the same FOV, without gaps and minimal overlap.***
- **Patient movement during the scan will disqualify the study and require rescan.**
- Minimize FOV in the range of 15 cm to 20 cm so the image captures the knee of interest, and corresponding hip and ankle. Leg alignment on the table will assist with this goal.
- Use a standard (soft tissue) reconstruction filter.
- If there are metal devices in the contralateral knee, please see page 2 for instructions.

Scan Parameters

Contrast	Area	FOV	Center	Spacing/ Thickness	Pitch	kV	Recon Filter
None	Specified Leg	15-20 cm	Constant	Equal - see diagram for values	1:1	120	Soft Tissue

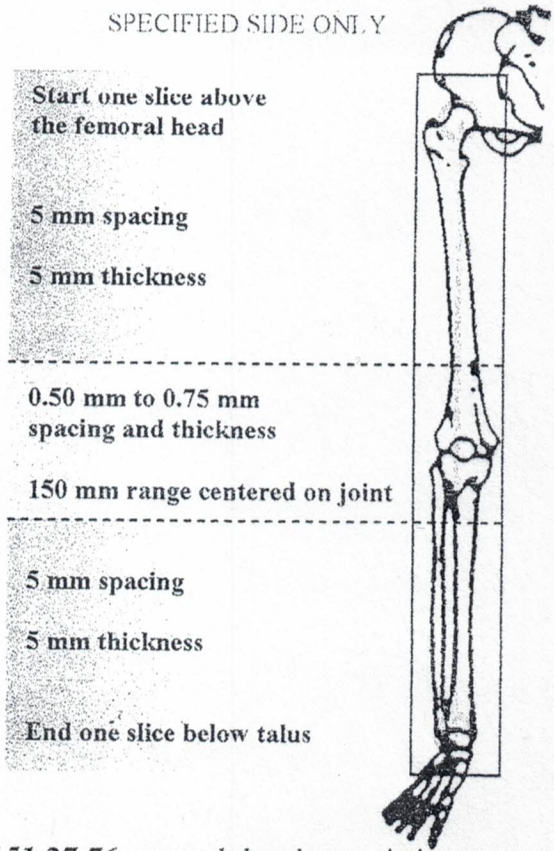
XYY's

Note: If your scanner will not support the whole leg in a single study, as shown, you may perform three separate studies. To do this, set the FOV on the full leg scout and only adjust the start and stop position such that the end position of the previous study is the start of the next study.
Patient movement between and during the scans will disqualify the study and require rescan.

Just send axials images
Write Doctor's name on disk

CPI
DePuy Orthopaedics, Inc.
700 Orthopaedic Drive
Warsaw, IN 46581-0988
(800) 689-0746

SPECIFIED SIDE ONLY



Jeff Roose or (DePuy ENGINEERS)
Brian Rose 800-473-3789

Call to arrange secure DICOM transfer to our PACS server, ***70.151.27.76***, or send the electronic image data as individual DICOM images on a CD, DVD, or optical disk. Label the disk with "CPI Knee", patient name, doctor name, imaging facility name, and imaging facility telephone number.

CT Prophecy Ankle

Updated 05/05/24
Reviewed 05/15/25

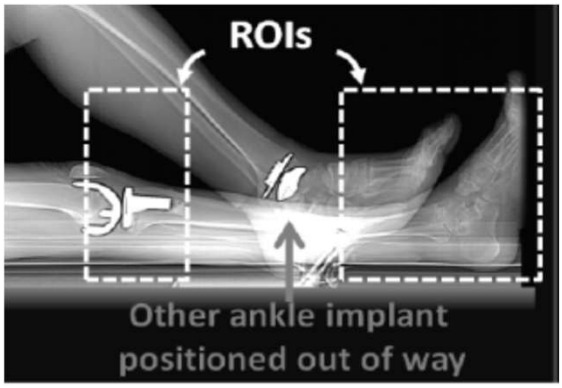
Indications - pre surgical evaluation prior to ankle joint replacement.
Bill under CT LE w/o Contrast charge. Do not include separate knee and ankle charges.

GENERAL SCAN NOTES

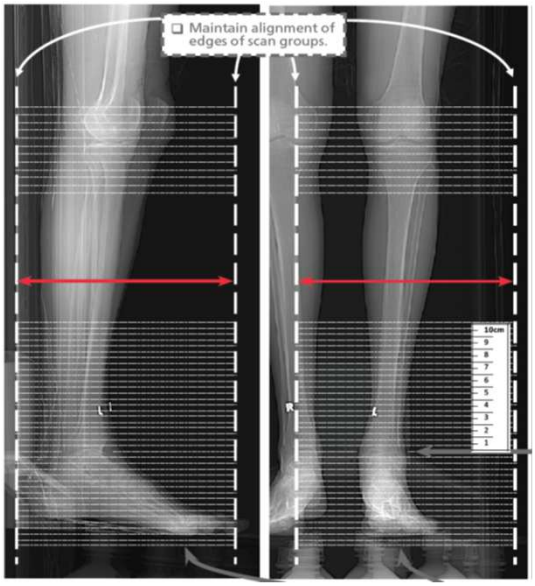
Remove any metal from the imaging field of view.
Patient positioning (see images at bottom of page):
- Have opposite leg bent at knee with ankle/foot out of way of ankle of interest.
- Foot must be dorsiflexed with foot perpendicular to tibia (90 degrees).
- Do not allow patient movement between or during the scans.

Topogram - from above knee through bottom of foot.
Craniocaudal scan coverage (see images at bottom of page):
- Knee - 5 cm superior to and 5 cm inferior to joint.
- Ankle - 10 cm superior to ankle joint through bottom of foot (including all toes).
- FOV of 280 mm preferred (must be <400 mm) using a 512 x 512 matrix squared.
- Okay if soft tissue from contralateral extremity is included.

IV Contrast: 100 mL Omnipaque-300, inject at 2.5 mL/sec, 60 secs scan delay.
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.
Prepare an uncompressed DICOM disc including the AP and lateral topograms, axial images of the knee and axial thin images of the ankle. This CD will need to go with the patient after the exam.



Ankle Positioning



Craniocaudal Scan Coverage

CT Prophecy Ankle

SIEMENS PARAMETERS & RECONS

For **Knee** and **Ankle** scans:

	Scan Mode	kV	mAs	Care Dose	Care kV & Lvl	Pitch	Acq	Coll	Rot Time
Sensation 16	spiral	120	140	on	NA	0.55	16	0.75	1.0
Go Up 32	spiral	Sn 110	366	on	on 75	0.40	32	0.7	1.0
Sensation 64	spiral	120	140	on	NA	0.90	64	0.6	1.0
Definition 64	spiral	120	100	on	**off**	0.80	64	0.6	1.0
Go Top 64	spiral	Sn 110	898	on	on	0.40	64	0.6	1.0
Drive 128	spiral	120	70	on	**off**	0.80	128	0.6	1.0
Force 192	spiral	120	70	on	**off**	0.80	192	0.6	1.0

KNEE RECONS

Name of Series	Thick	Interval	Kernel	Window	IR Lvl	Recon Direction	
AX KNEE BONE	**3.0**	**3.0**	**Br59 / B60**	**bone/osteo**	**3**	**head/feet**	**Prophecy specific recon.**
COR KNEE BONE	3.0	3.0	Br59 / B60	bone/osteo	3	front/back	
SAG KNEE BONE	3.0	3.0	Br59 / B60	bone/osteo	3	left/right	

ANKLE RECONS

AX ANKLE BONE	2.0	2.0	Br59 / B60	bone/osteo	3	head/feet	
COR ANKLE BONE	2.0	2.0	Br59 / B60	bone/osteo	3	front/back	
SAG ANKLE BONE	2.0	2.0	Br59 / B60	bone/osteo	3	left/right	
AX ANKLE THINS	**1.0**	**1.0**	**Br59 / B60**	**bone/osteo**	**3**	**head/feet**	**Prophecy specific recon.**

CT Prophecy Ankle

GE PARAMETERS & RECONS

For **Knee** and **Ankle** scans:

	Scan Type	SFOV	kV	mA Range	Noise Index	Smart mA	Slice Thick	Beam Coll	Pitch	Speed	Rot Time	Dose Red	ASIR
LS 16	helical	large	120	100-440	12.50	on	2.5	10	0.938	9.37	0.5	NA	NA
Opt 540	helical	large	120	100-440	12.50	on	2.5	10	0.938	9.37	0.5	NA	NA
LS VCT 64	helical	large body	120	100-450	16.00	on	2.5	40	0.984	39.37	0.5	20	20
Disc VCT 64	helical	large body	120	100-450	16.00	on	2.5	40	0.984	39.37	0.5	20	20

KNEE RECONS

Name of Series	Thickness	Interval	Recon Algorithm/Mode	Window Width/Level	Recon Direction	
AX KNEE BONE	**2.5**	**2.5**	**bone full**	**2500/480**	**head/feet**	**Must be first recon.**
COR KNEE BONE	2.5	2.5	bone full	2500/480	front/back	**Prophecy specific recon.**
SAG KNEE BONE	2.5	2.5	bone full	2500/480	left/right	

ANKLE RECONS

AX ANKLE BONE	**2.5**	**2.5**	**bone full**	**2500/480**	**head/feet**	**Must be first recon.**
COR ANKLE BONE	2.5	2.5	bone full	2500/480	front/back	
SAG ANKLE BONE	2.5	2.5	bone full	2500/480	left/right	
AX ANKLE THINS	**0.625**	**0.625**	**bone plus full**	**2500/480**	**head/feet**	**Prophecy specific recon.**

CT Prophecy Ankle

PHILIPS PARAMETERS & RECONS

For **Knee** and **Ankle** scans:

	Scan Mode	kV	Avg mAs	Dose Index	3D Dose	Pitch	Detect	Colli	Rot Time
Incisive 128	helical	120	85	32	on	0.80	64	0.625	1.00

KNEE RECONS

Name of Series	Thick	Interval	Filter	Window	iDose	Recon Direction	
AX KNEE BONE	**3.0**	**3.0**	**YC**	**bone**	**3**	**head/feet**	**Prophecy specific recon.**
COR KNEE BONE	3.0	3.0	YC	bone	3	front/back	
SAG KNEE BONE	3.0	3.0	YC	bone	3	left/right	

ANKLE RECONS

AX ANKLE BONE	2.0	2.0	YC	bone	3	head/feet	
COR ANKLE BONE	2.0	2.0	YC	bone	3	front/back	
SAG ANKLE BONE	2.0	2.0	YC	bone	3	left/right	
AX ANKLE THINS	**1.0**	**1.0**	**YC**	**bone**	**3**	**head/feet**	**Prophecy specific recon.**

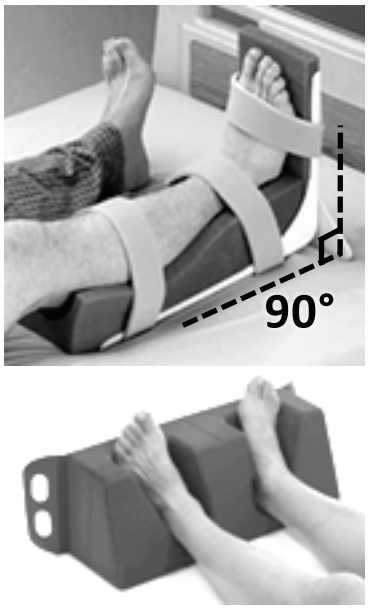


FIGURE 1 *Examples of neutral ankle positioning devices (not provided). Any radiolucent object can be used to prop the bottom of the foot at 90°, such as a box.*

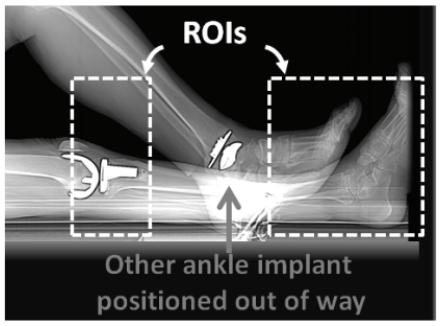


FIGURE 2 *Bending the other limb to position the other ankle implant away from the ankle of interest. This minimizes image artifact in the ankle Region Of Interest.*

PROPHECY Ankle CT Scan Protocol

PROPHECY INBONE™, INFINITY™ and INVISION™ Preoperative Navigation Reports and Guides are patient-specific tools for total ankle replacement surgery. Adherence to this lower extremity CT protocol of the ankle, with knee, is critical for success. In every case, please follow these instructions:

Patient Position

- ❑ The foot of interest should be positioned in neutral (90°) to the leg. FIGURE 1

  NOTE: If this is not possible due to a patient's condition, such as severe contracture, ensure the CT scan contains slices through the ball of the foot (see bottom of next page).
- ❑ If a contra-lateral implant is present, bend the contra-lateral limb out of the field of view of the ankle to be scanned. FIGURE 2
- ❑ Do not allow patient movement between or during scans.

Scanning Instructions

Helical, axial, and cone beam CT modes are acceptable.

Bone or Standard algorithms are acceptable.

No contrast agent is to be used.

- ❑ All scan groups' edges should stay aligned. See dashed lines, next page.
  - Maintain a single coordinate system for both the knee and foot scan.
  - Maintain a consistent field of view and pixel size for both the knee and foot scan.
  - Adjusting the width of both knee and foot groups together to span the required anatomy of both groups is appropriate.
  - One single scan from the bottom of the foot through the knee is also acceptable.
- ❑ In-plane pixel size (resolution) must be less than 0.8mm.
  Example: A Field of View of ~28 cm is ideal for a 512x512 matrix in order to keep the pixel size small. The Field of View must be less than 40 cm.
- ❑ Include full knee-to-foot scout images (coronal and sagittal) when submitting CT files to Wright.

Other:

- Do not scan at higher slice spacing and reconstruct to smaller increments.
- Only the raw axial images are needed; coronal and sagittal reconstructions are not necessary.
- Images must be provided in uncompressed DICOM format.

If the ankle of interest has existing hardware it can be scanned with the same parameters as listed here.

NOTE: It is highly recommended that additional x-ray studies be submitted to Wright for analysis for PROPHECY pre-op navigation. Useful additional studies include:

- Weight-bearing lateral x-ray
- Stress x-rays/Talar tilt x-rays of the medial deltoid and/or lateral ligaments.

PROPHECY Ankle CT Scan Protocol

This "ankle" protocol involves a section at the knee.

REQUIRED:

- ❑ Provide full Knee-to-Foot CT "scout" images (coronal & sagittal).
- ❑ Scan both the Foot-&-Ankle AND Knee sections at the same time.
- ❑ Refer to additional requirements on previous page.
- ❑ Refer to typical errors and FAQs on next pages.

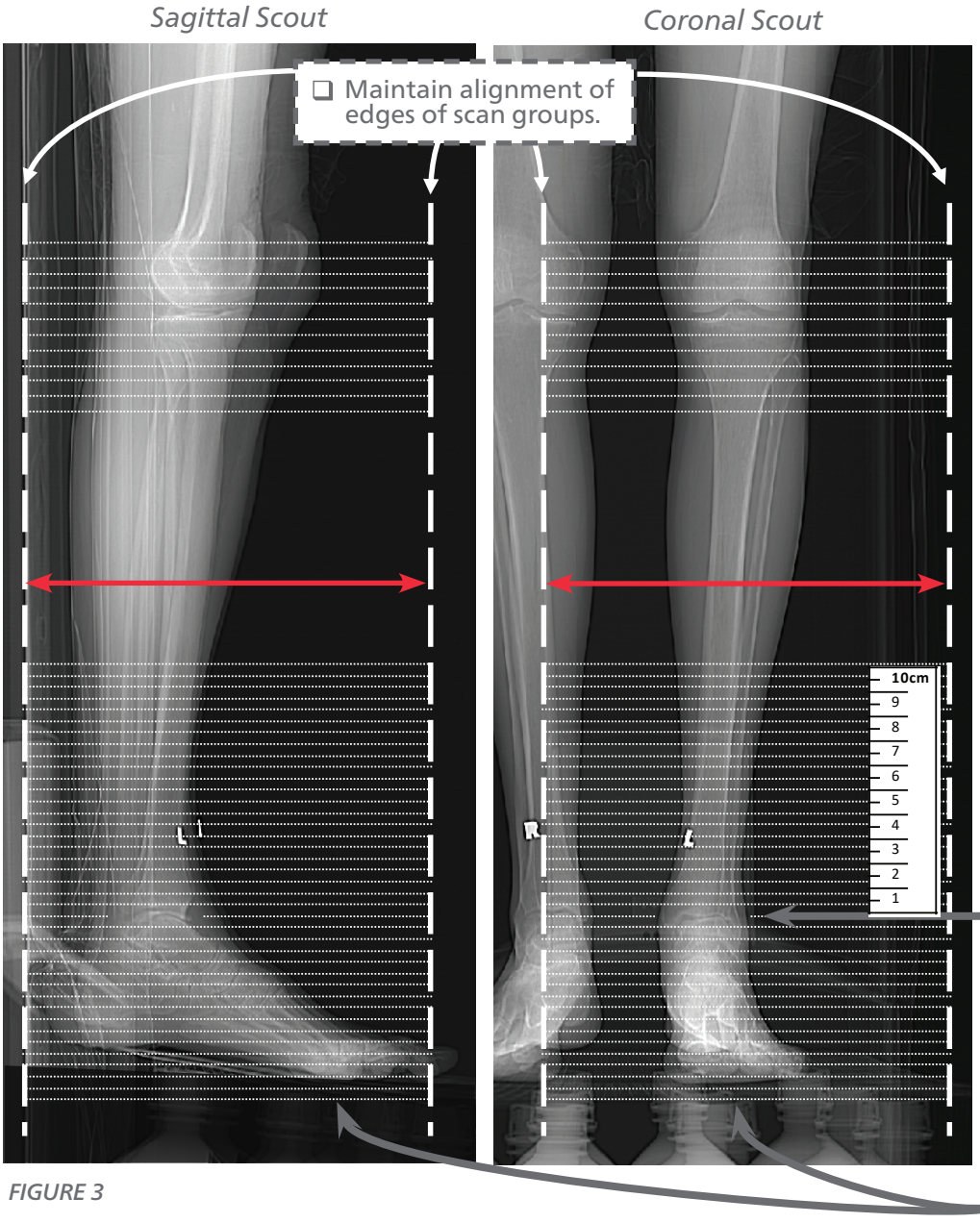


FIGURE 3

REQUIRED:

- ❑ Scan 5cm proximal, and 5cm distal to the knee joint line.
- ❑ Slice increment: 5mm (or smaller).
- ❑ Field Of View: Typical: ~28cm. Max: 40cm.

REQUIRED:

- ❑ Ankle and foot scan slice increment: 1.25mm (or smaller).
- ❑ Scan >10cm above the joint line Measure this, see note below.
- ❑ Scan <u>past</u> the ball of the foot, and get the toes.
- ❑ Position the foot at 90° with a positioning device or heavy box.

NOTE:

- ❑ *It's better to "airball" the last slices than to not get enough.*

NOTE:

- ❑ Measure (or calculate) to get >10cm above the joint line.
  Examples: 80 slices @ 1.25mm or 100 slices @ 1.0mm or 160 slices @ 0.625mm above the joint line.

Common Scan Protocol Errors

The most common protocol errors resulting in failed scans are shown below:

Region missing from scan.

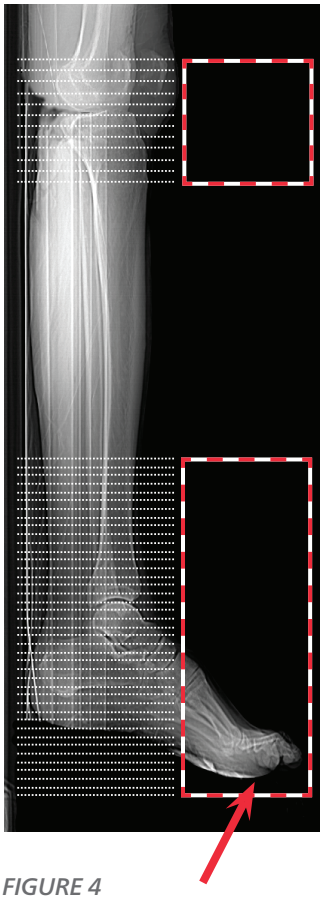


FIGURE 4
☒ *Failure to scan the entire foot.*

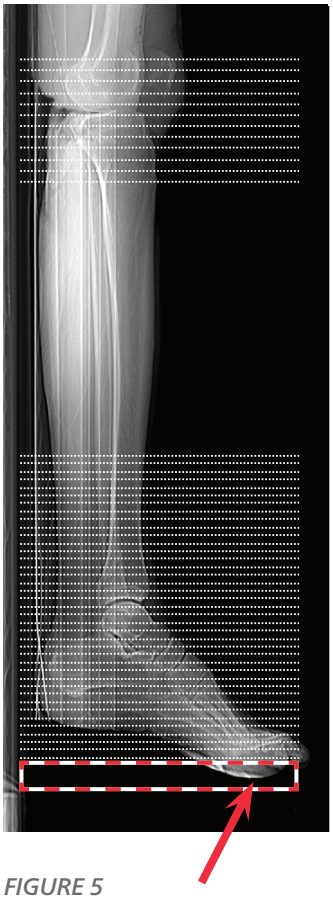


FIGURE 5
☒ *Failure to scan the entire foot.*

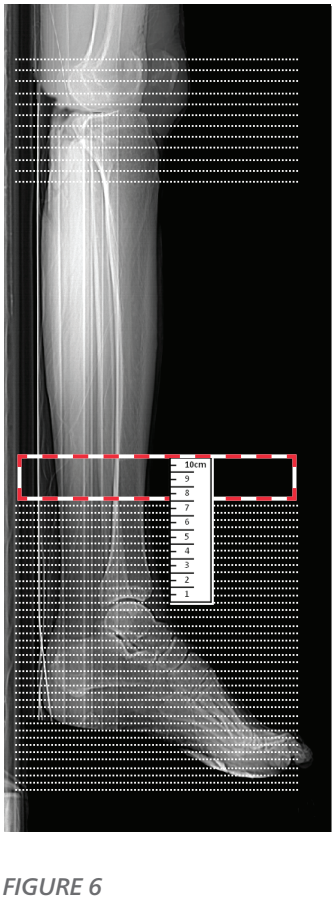


FIGURE 6
☒ *Failure to scan at least 10cm above the ankle joint.*

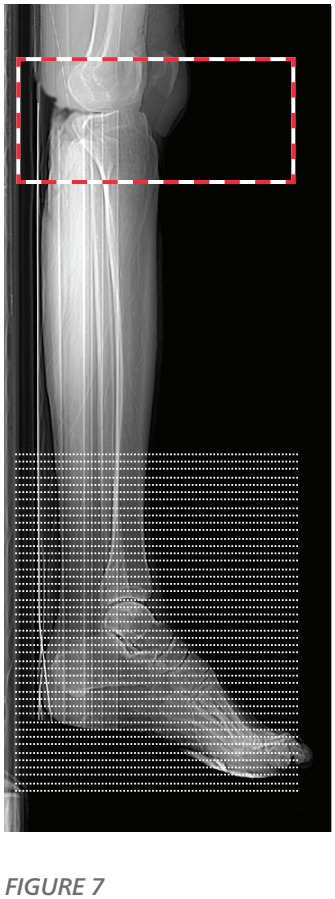
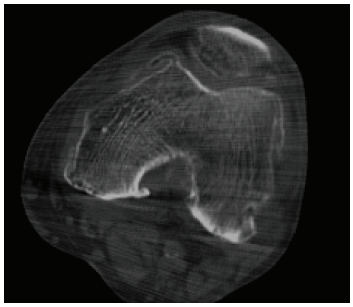
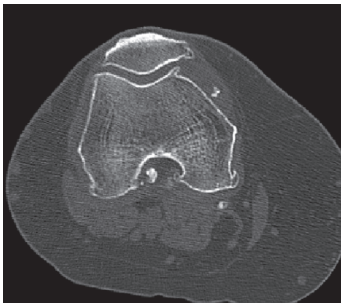


FIGURE 7
☒ *Scan of the knee was not performed simultaneously with the ankle.*

CT Imaging Examples



Unacceptable CT imaging
☒ *Blurry, poor contrast.*



Satisfactory CT Imaging
☑ *Clear, sharp, distinct boundaries between bone and soft tissue.*

Frequently Asked Questions

Q. "I can't put in a 1.25mm slice. I can only do a 1mm increment. Is that ok?"
A. Slices thinner than our specified slice thickness are acceptable; however, using larger slices will result in the scan being rejected for PROPHECY processing.

Q. "What type of CT acquisition can be used?"
A. Axial, helical, and cone beam CT modes are acceptable.

Q. "Is it really necessary to scan 10cm above the ankle joint?"
A. Yes. At least 10cm of the tibia shaft, measured from the ankle joint line, is required.

Q. "Do I need to scan the knee for an ankle surgery?"
A. Yes. The knee scan is required to obtain the complete axis of the lower extremity. Information based on the entire tibia is used to plan the ankle procedure.

Q. "How should the patient be positioned?"
A. Patients are typically supine for the scan, but it does not matter as long as the patient's ankle is in neutral dorsiflexion.

Submitting the Scan

Rapid Electronic Scan Transfer

Preoperative CT may be sent to the PROPHECY engineering team through our secure, rapid electronic transfer system: https://prophecyscans.wmt.com

Please follow these steps to request an account and transfer scans:

1. E-mail prophecy@wright.com with the e-mail address of the person who needs access to the system (No other information is needed)

2. Within a few hours, an invitation message will be sent to that address with instructions to complete registration on the scan transfer site.

*** upload times may vary based on connection speed.*

Scan submission is typically done by first putting the DICOM files from the CT Scanner computer onto a CD, then putting the CD into a typical office computer for uploading. Therefore, ensure the CD contains the Axial CT slices and full-length scout images.

FAQ: Can I mail the CD of the CT scan?
A. This method is not preferred.

If uploading the scans directly from the scanning facility is not possible, please contact the local Wright Medical sales rep to do so. If the sales rep contact information is not known, call the number below.

Contact for Assistance

PROPHECY Operations at Wright Medical Technology
Phone: 901.290.5884 **Fax:** 901.867.4791
email: prophecy@wright.com

The Centers for Medicare & Medicaid Services (CMS) established a National Coverage Determination (NCD) for CT Scans. It states, in part, the following, "Diagnostic examinations of the head (head scans) and of other parts of the body (body scans) performed by computerized tomography (CT) scanners are covered if medical and scientific literature and opinion support the effective use of a scan for the condition, and the scan is: (1) reasonable and necessary for the individual patient." CTs performed prior to total joint replacement procedures for diagnostic purposes may be considered medically necessary. In which case, the procedure should be billed using the CPT codes that accurately describe the imaging procedure furnished to the patient. These same images from the diagnostic CT scan may, in turn, be further utilized for developing the personalized cutting or navigation guides that are used in orthopaedic procedures. However, if providers perform CT scans solely for the purpose of developing personalized cutting instruments or guides, providers should contact the payer for billing and coverage guidance and/or the American College of Radiology with billing questions.

CT MAVEN Ankle

Updated 05/09/25
Reviewed 05/15/25

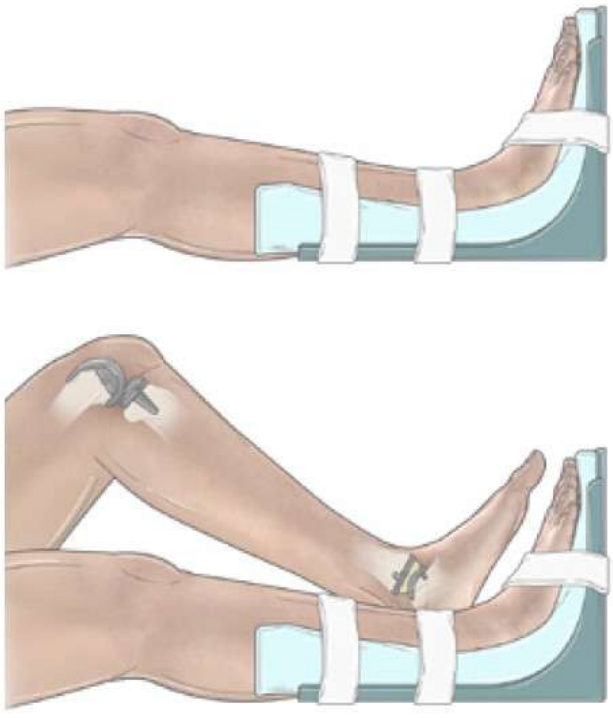
Indications - pre surgical evaluation prior to ankle joint replacement.
Bill under CT LE w/o Contrast charge. Do not include separate knee and ankle charges.

GENERAL SCAN NOTES

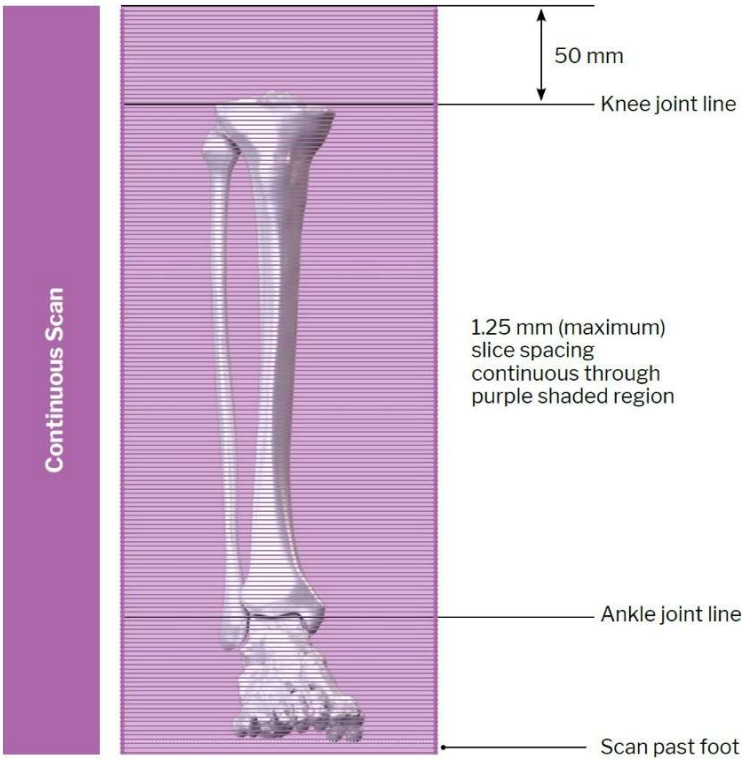
Remove any metal from the imaging field of view.
Patient positioning (see images at bottom of page):
- Foot of interest must be dorsiflexed with foot perpendicular to tibia (90 degrees).
- A foot holder/brace is not required. Do not place a cushion/pillow under the leg of interest.
- The opposite leg can be flat next to the leg of interest, unless there is knee and/or ankle hardware in the opposite leg, then have the opposite leg bent at knee with ankle/foot out of way of ankle of interest.

Topogram - from above knee through bottom of foot.
Craniocaudal scan coverage (see images at bottom of page):
- 5 cm superior to knee continuously through bottom of foot (metatarsals must be imaged entirely).

FOV: 25 cm (preferred) up to 40 cm acceptable.
IV Contrast: not given for this protocol.
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.
Prepare an uncompressed DICOM disc and upload to www.apexankle.com.
Contact: Rick Agliata, RAgliata@paragon28.com, 904-562-9334.



Ankle Positioning



Craniocaudal Scan Coverage

CT MAVEN Ankle

SIEMENS PARAMETERS & RECONS

For **Knee** and **Ankle** scans:

	Scan Mode	kV	mAs	Care Dose	Care kV & Lvl	Pitch	Acq	Coll	Rot Time
Sensation 16	spiral	120	140	on	NA	0.55	16	0.75	1.0
Go Up 32	spiral	Sn 110	366	on	on 75	0.40	32	0.7	1.0
Sensation 64	spiral	120	140	on	NA	0.90	64	0.6	1.0
Definition 64	spiral	120	100	on	**off**	0.80	64	0.6	1.0
Go Top 64	spiral	Sn 110	898	on	on	0.40	64	0.6	1.0
Drive 128	spiral	120	70	on	**off**	0.80	128	0.6	1.0
Force 192	spiral	120	70	on	**off**	0.80	192	0.6	1.0

Name of Series	Thick	Interval	Kernel	Window	IR Lvl	Recon Direction	
AX BONE	3.0	3.0	Br59 / B60	bone/osteo	3	head/feet	
AX THINS BONE	**1.0**	**1.0**	**Br59 / B60**	**bone/osteo**	**3**	**head/feet**	**MAVEN specific recon.**
COR BONE	3.0	3.0	Br59 / B60	bone/osteo	3	front/back	
SAG BONE	3.0	3.0	Br59 / B60	bone/osteo	3	left/right	
AX SOFT	3.0	3.0	Br59 / B60	abdomen	3	head/feet	

GE PARAMETERS & RECONS

	Scan Type	SFOV	kV	mA Range	Noise Index	Smart mA	Slice Thick	Beam Coll	Pitch	Speed	Rot Time	Dose Red	ASIR
LS 16	helical	large	120	100-440	12.50	on	2.5	10	0.938	9.37	0.5	NA	NA
Opt 540	helical	large	120	100-440	12.50	on	2.5	10	0.938	9.37	0.5	NA	NA
LS VCT 64	helical	large body	120	100-450	16.00	on	2.5	40	0.984	39.37	0.5	20	20
Disc VCT 64	helical	large body	120	100-450	16.00	on	2.5	40	0.984	39.37	0.5	20	20

KNEE RECONS

Name of Series	Thickness	Interval	Recon Algorithm/Mode	Window Width/Level	Recon Direction	
AX BONE	**2.5**	**2.5**	**bone full**	**2500/480**	**head/feet**	**Must be first recon.**
AX THINS	**1.25**	**1.25**	**bone full**	**2500/480**	**head/feet**	**MAVEN specific recon.**
COR BONE	2.5	2.5	bone full	2500/480	front/back	
SAG BONE	2.5	2.5	bone full	2500/480	left/right	
AX SOFT	2.5	2.5	bone full	400/40	head/feet	

CT MAVEN Ankle

PHILIPS PARAMETERS & RECONS

	Scan Mode	kV	Avg mAs	Dose Index	3D Dose	Pitch	Detect	Colli	Rot Time
Incisive 128	helical	120	85	32	on	0.80	64	0.625	1.00

Name of Series	Thick	Interval	Filter	Window	iDose	Recon Direction
AX BONE	3.0	3.0	YC	bone	3	head/feet
AX THINS	**1.0**	**1.0**	**YC**	**bone**	**3**	**head/feet**
COR BONE	3.0	3.0	YC	bone	3	front/back
SAG BONE	3.0	3.0	YC	bone	3	left/right
AX SOFT	3.0	3.0	YC	abdomen	3	head/feet

MAVEN specific recon.

SIMULATED WEIGHT-BEARING CT SCANNING PROTOCOL

MAVEN™ PSI System – APEX 3D™ Total Ankle Replacement

MAVEN™ PATIENT SPECIFIC SURGERY

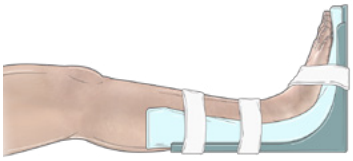
Paragon 28®

PURPOSE:

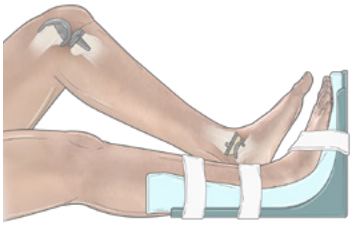
Conduct simulated weight-bearing CT scan for MAVEN™ Patient-Specific Guide and Surgical Planning Case Report creation for the Paragon 28® APEX 3D™ Total Ankle Replacement System. Adhering to this CT scan protocol is critical.

PATIENT POSITION ON CT TABLE:

- **Patient: Supine position**
  - No cushions/wedges under legs or feet; may push metatarsal bases out of the field of view, causing scans to be rejected.



- **Affected leg: Foot in neutral flexion**
  - Foot MUST be perpendicular to table with toes pointed up
  - Holder/brace use is REQUIRED to ensure foot alignment



- **Unaffected leg: Flat on table next to affected leg, UNLESS:**
  - If there is a knee (TKR) or ankle (TAR) implant in the unaffected leg, flex leg to get implant out of plane from affected leg and FOV. Positioned in neutral/90° to the leg. (Use of box or positioning box if necessary).

- **INSTRUCT: Patient CANNOT move during scan OR between scan(s).**

SCAN REQUIREMENTS:

- **Scout**
  - Above knee contiguous – down through extents of foot.
- **Scan**
  - Range: Include full knee to ankle. Ensure complete foot is in view (MUST include metatarsals without cut off; can cut off posterior heel and distal toes). See following page.
  - Scan mode: Helical
  - Gantry tilt: 0°
  - File format: Uncompressed DICOM
  - Pixel size: 0.8mm or smaller in axial view (25cm DFOV preferred, up to 40cm accepted)
- **Reformats: None**
- **Burn: DICOM CD**
  - Upload through website: www.apexankle.com
  - Mail:

Attn: Paragon 28® MAVEN™ TAR PSI
5381 South Alkire Circle
Littleton, CO 80127

SIMULATED WEIGHT-BEARING CT SCANNING PROTOCOL

MAVEN™ PSI System – APEX 3D™ Total Ankle Replacement

MAVEN PATIENT SPECIFIC SURGERY

Paragon 28

CT SCAN PARAMETERS – PARAGON 28 MAVEN TAR PROTOCOL

Exam	Scan Mode	Pitch	Slice Thickness (mm)	Slice Spacing (mm)	kV	mA/Auto mA Noise Index Dose Range	DFOV (cm)	Recon Type
Lower Extremity	Helical	Up to 1	1.25	1.25	120	115	25 preferred (Up to 40 accepted)	Bone 2000/400

- **Continuous Scan:**
  - 5 cm proximal to knee joint through bottom of foot (MUST include metatarsals without cut off; can cut off posterior heel and distal toes; see gray shaded region in figure)

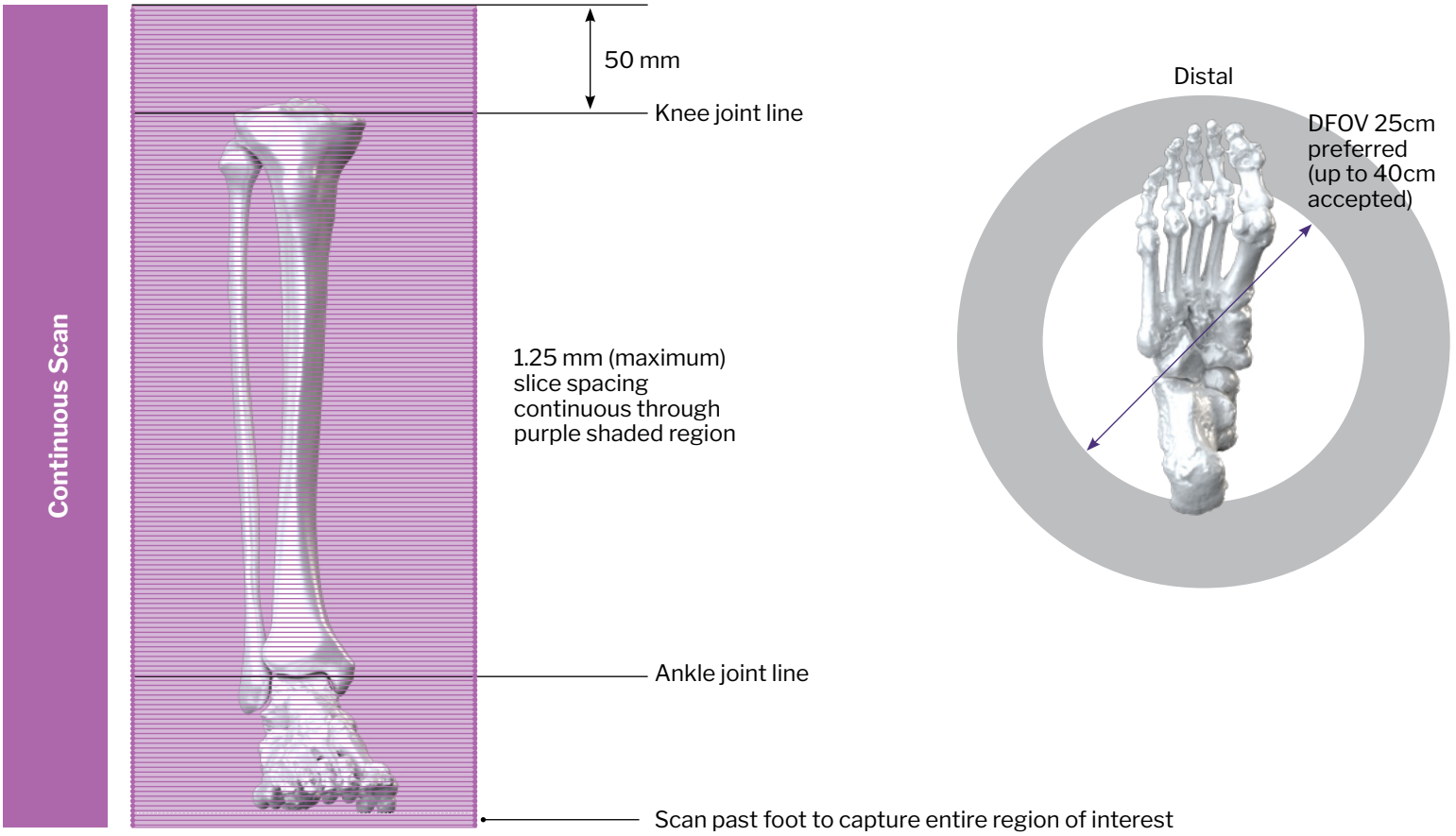


Figure 1. Schematic of scan boundary and slice spacing for continuous knee and ankle scan