CT Stryker Shoulder (Tornier/Mako)

Updated 05/07/26
Reviewed 05/07/26

Also known as Tornier, Mako or Blueprint.
Indications - pre surgical evaluation for shoulder joint replacement.
Bill under CT Shoulder w/o Contrast charge.

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 third of 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	200	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**	**0.625**	**Br59 / B60f**	**bone/osteo**	**3**	**head/feet**	**Stryker specific recon.**

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

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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**	**0.625**	**bone full**	**2500/480**	**head/feet**	**Stryker specific recon.**

PHILIPS PARAMETERS & RECONS

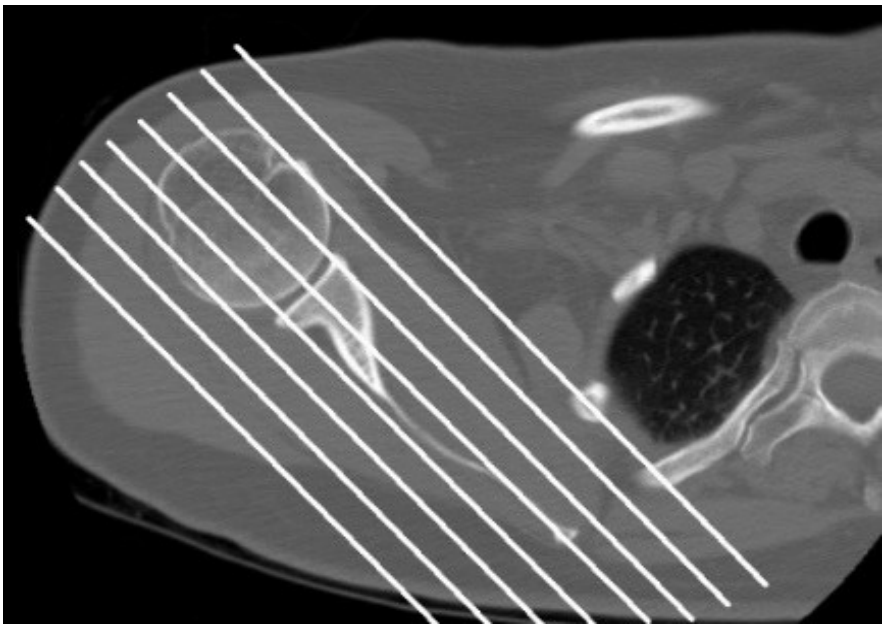
	Scan Mode	kV	Avg mAs	Dose Index	3D Dose	Pitch	Detect	Colli	Rot Time	Scan Time
Incisive 128	helical	120	129	22	on	0.80	64	0.625	1.00	3.1

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**	**0.625**	**YC**	**bone**	**3**	**head/feet**	**Stryker specific recon.**

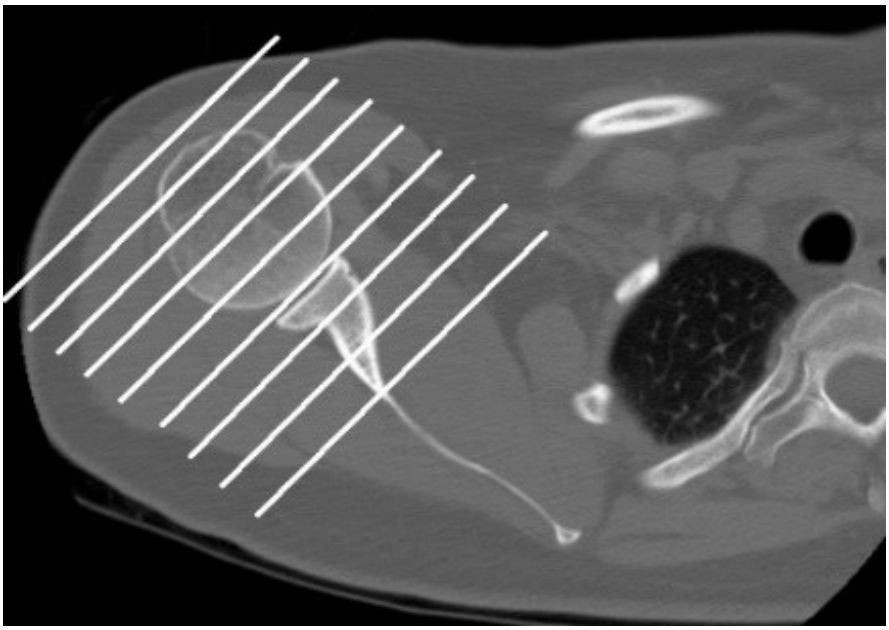
If the scan parameters do not allow for 0.625 mm thickness, pick as close to 0.625 mm as the scanner will allow but no thicker than 1.0 mm. The interval must be the same thickness and the slice thickness.

Company Representative: Keith Tighe - keith.tighe@stryker.com, 352-817-4751

CT Stryker Shoulder (Tornier/Mako)



Coronal Plane



Sagittal Plane

stryker

Blueprint®

Scan protocol

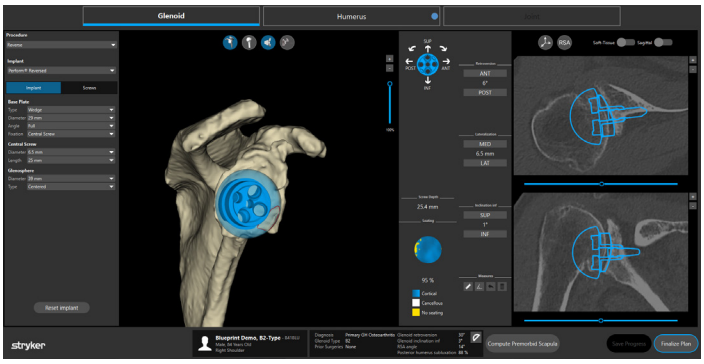
Blueprint
Scan protocol

Contents

Introduction

Blueprint scan protocol

This document describes the guidelines and parameters for a shoulder CT scan (without contrast) following the Blueprint protocol and how the images are then processed in the Blueprint software.



The software creates a 3D model (using only the thin axial images) which the surgeon uses to “virtually” plan a shoulder replacement surgery utilizing the Stryker implant portfolio.

The thin axial images can be uploaded directly into the ordering physician’s Blueprint account via our secure cloud.

If the physician requests the images be uploaded to the Blueprint Cloud, please refer to page 7 for full instructions. Should you not be able to upload to the physician’s Blueprint account, the thin axial images may need to be burned to a CD or USB drive if the facilities PACS software will not allow the surgeon to download the entire axial DICOM series.

If you have any questions or require any assistance, please contact the Blueprint Team.

Email: Blueprint_us@stryker.com
Phone: 855.378.1459
Managed 8:00am-5:00pm CST

If you would like to see what else we are accomplishing at Stryker utilizing the Blueprint software, please visit **www.shoulderblueprint.com**

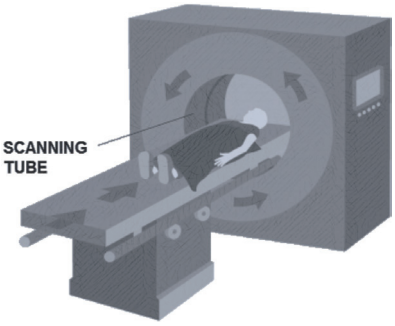
Patient preparation and scan instructions

Patient prep

Place patient supine on the table with humerus along the trunk of the patient. Arm/humerus is in the neutral position with the patient's thumb up.

ISO-center the patient to avoid any out of field artifact. You may place a small pillow between the humerus and the trunk of the patient.

If the patient is unable to be positioned with the humerus along their trunk in neutral position, they can bend the elbow with the hand across the stomach.



Position of the patient in the machine

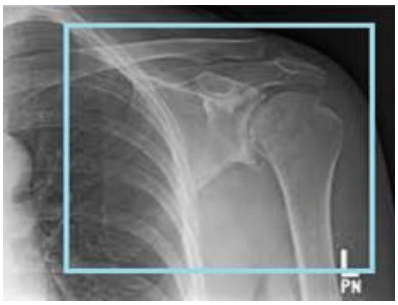
Breathing instructions

Patient is to hold their breath. If a breath hold is not possible, shallow breathing is necessary to prevent motion.

Scan range

Without metal or a cement spacer in the shoulder

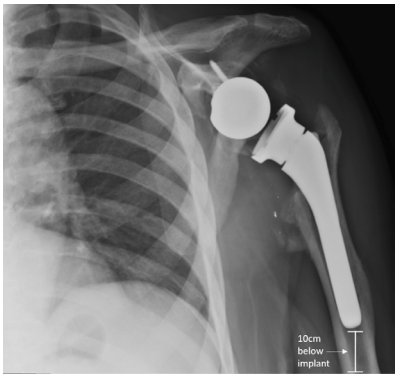
Start the scan a few slices above the AC joint, include the entire scapula and a few slices below the inferior angle of the scapula. The medial border of the scapula must be shown in the scan. The DFOV must be between 25 cm and 32 cm.



Full scan of the scapula

With metal or a cement spacer in the shoulder

Start the scan a few slices above the AC joint, include the entire scapula and 10 cm below the current implant (when possible) without exceeding the maximum DFOV of 32 cm. The medial border of the scapula must be shown in the scan.



Full scan 10 cm below current metal implant

Metal Artifact Reduction (MAR)/metal suppression software

We strongly recommend patients with metal to be done on CT scanners using metal artifact reduction/ suppression software, if available.

No gantry tilt. Reformatted images are not accepted in the software.

Note:
Axial slice thickness must not be greater than 1.00 mm. The entire glenohumeral joint and scapula must be scanned. See parameters for scan range and DFOV.

Blueprint scan protocols

GE scanners

Start the scan a few slices above the AC joint, include the entire scapula and a few slices below the inferior angle of the scapula. The medial border of the scapula must be shown in the scan.

If an implant is present, include the entire scapula and 10 cm below the current implant (when possible) without exceeding the maximum DFOV of 32 cm. The medial border of the scapula must be shown in the scan.

Important:

- **No gantry tilt**
- **No contrast**
- **All slices must have the same field of view and same slice spacing**
- **Blueprint requires .625 mm x .625 mm axial images (do not exceed .625 mm)**
- **No interval/overlapping slices**
- **Matrix must be 512 x 512**
- **No reformatted images will be accepted**

Metal Artifact Reduction

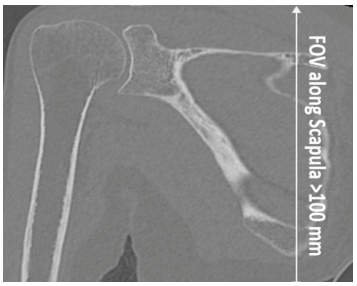
We strongly recommend patients with metal to be done on CT scanners using metal artifact reduction/suppression software, if available.

If MAR is not available, increase KVP to 140.

Parameter	Setting
Modality	CT Shoulder without contrast
Kernel /algorithm	Bone
KVP	120 or 140 if metal is present
mA	Auto
Slice thickness	.625 mm x .625 mm
Detector coverage	Maximum
Pitch	0.9 or less
Rotation time	1 second or less
Exposure time	1000 ms
Matrix	512 x 512
DFOV	25 cm to 32 cm
Bits allocated	16

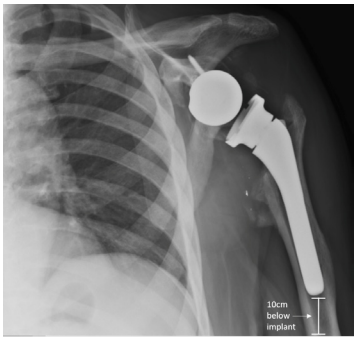
Set DICOM tag "study description" to "Blueprint thin axials."

Note:
If the scan is ordered as "bilateral shoulders," each shoulder must be scanned separately.



DFOV (frontal plane)

DFOV (axial plane)



Full scan 10 cm below current metal implant

Blueprint scan protocols

Siemens scanners

Start the scan a few slices above the AC joint, include the entire scapula and a few slices below the inferior angle of the scapula. The medial border of the scapula must be shown in the scan.

If an implant is present, include the entire scapula and 10 cm below the current implant (when possible) without exceeding the maximum DFOV of 320 mm. The medial border of the scapula must be shown in the scan.

Important:

- **No gantry tilt**
- **No contrast**
- **All slices must have the same field of view and same slice spacing**
- **Blueprint requires 1 mm x 1 mm axial images**
- **No interval/overlapping slices**
- **Matrix must be 512 x 512**
  - **All Siemens scanners must be manually set to a squared matrix**
- **No reformatted images will be accepted**

Metal Artifact Reduction

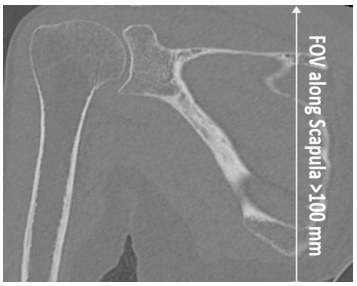
We strongly recommend patients with metal to be done on CT scanners using metal artifact reduction/suppression software, if available.

If MAR is not available, increase KVP to 140.

Parameter	Setting
Modality	CT shoulder without contrast
Kernel /algorithm	Bone 70's – set window to bone
KVP	120 or 140 if metal present
mA	Auto
Slice thickness	1 mm x 1 mm or thinner
Detector coverage	Maximum
Pitch	0.9 or less
Rotation time	1 second or less
Exposure time	1000 ms
Matrix	512 x 512 – all Siemens scanners must be manually set to a squared matrix
DFOV	250 mm to 320 mm
Bits allocated	16

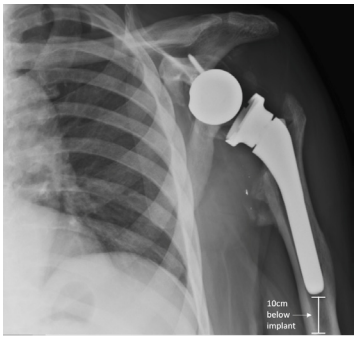
Set DICOM tag "study description" to "Blueprint thin axials."

Note:
If the scan is ordered as "bilateral shoulders," each shoulder must be scanned separately.



DFOV (frontal plane)

DFOV (axial plane)



Full scan 10 cm below current metal implant

Blueprint scan protocols

Canon scanners

Start the scan a few slices above the AC joint, include the entire scapula and a few slices below the inferior angle of the scapula. The medial border of the scapula must be shown in the scan.

If an implant is present, include the entire scapula and 10 cm below the current implant (when possible) without exceeding the maximum DFOV of 320 mm. The medial border of the scapula must be shown in the scan.

Important:

- **No gantry tilt**
- **No contrast**
- **All slices must have the same field of view and same slice spacing**
- **Blueprint requires 1 mm x 1 mm axial images (do not exceed 1 mm x 1 mm)**
- **No interval/overlapping slices**
- **Matrix must be 512 x 512**
- **Standard bone volumes are required**
- **No reformatted images will be accepted**
- **Only standard bone volumes are utilized for Blueprint scans**

Metal Artifact Reduction

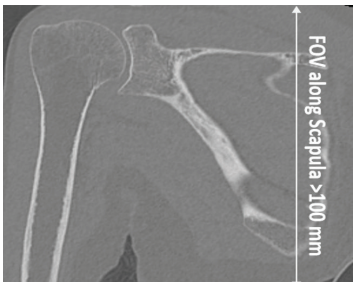
We strongly recommend patients with metal to be done on CT scanners using metal artifact reduction/suppression software, if available.

If MAR is not available, increase KVP to 140.

Parameter	Setting
Modality	CT Shoulder without contrast
Kernel /algorithm	Bone Standard
KVP	120/130 – 135/140 (depending on your scanner)
mA	Auto
Slice thickness	1 mm x 1 mm (do not exceed)
Detector coverage	Maximum
Pitch	0.9 or less
Rotation time	1 second or less
Exposure time	1000 ms
Matrix	512 x 512
DFOV	250 mm to 320 mm
Bits allocated	16

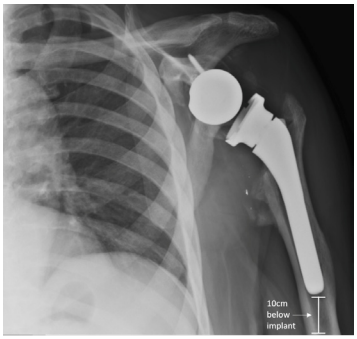
Set DICOM tag "study description" to "Blueprint thin axials."

Note:
If the scan is ordered as "bilateral shoulders," each shoulder must be scanned separately.



DFOV (frontal plane)

DFOV (axial plane)



Full scan 10 cm below current metal implant

Blueprint scan protocols

Philips scanners

Start the scan a few slices above the AC joint, include the entire scapula and a few slices below the inferior angle of the scapula. The medial border of the scapula must be shown in the scan.

If an implant is present, include the entire scapula and 10 cm below the current implant (when possible) without exceeding the maximum DFOV of 320 mm. The medial border of the scapula must be shown in the scan.

Important:

- **No gantry tilt**
- **No contrast**
- **All slices must have the same field of view and same slice spacing**
- **Blueprint requires 1 mm x 1 mm or thinner axial images**
- **No interval/overlapping slices**
- **Matrix must be 512 x 512**
- **No reformatted images will be accepted**

Metal Artifact Reduction

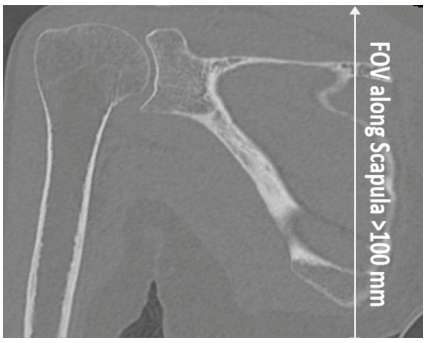
We strongly recommend patients with metal to be done on CT scanners using metal artifact reduction/suppression software, if available.

If MAR is not available, increase KVP to 140.

Parameter	Setting
Modality	Body
Collimation	64 x .625
Kernel /algorithm	Bone
KVP	120 or 140
mA	Auto
Thickness/increment	1 mm x 1 mm (do not exceed)
Detector coverage	Maximum
Pitch	0.8
Rotation time	1
Exposure time	1000 ms
Matrix	512 x 512
DFOV	250 mm to 320 mm
Resolution	High
Filter	Sharp
Bone window	Set a preferred window
Bits allocated	16

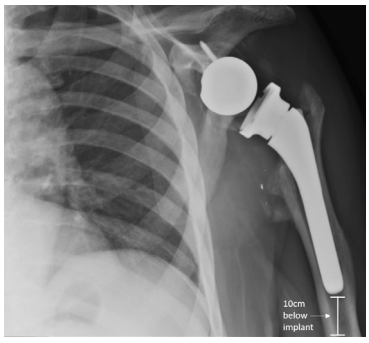
Set DICOM tag “study description” to “Blueprint thin axials.”

Note:
If the scan is ordered as "bilateral shoulders," each shoulder must be scanned separately.



DFOV (frontal plane)

DFOV (axial plane)



Full scan 10 cm below current metal implant

Uploading DICOM images via the Blueprint cloud

The thin axial images can to be uploaded directly into the ordering physician's Blueprint account via our secure cloud system. If the ordering physician has requested this, follow these instructions:

How to register for a Blueprint CT scan technologist account

Step 1:
Go to: **https://oms.tornierblueprint.com/register** and complete the registration form or **shoulderblueprint.com** and click Register near the top of the home page on the right side of the screen.

Step 2:
Once you receive the account activation email, verify your email address and create your password.

Accessing your online account
(the place where you upload DICOM images)

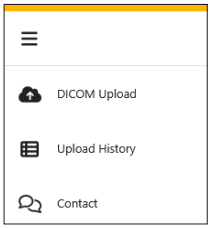
Step 1:
Use Google Chrome as your browser.
Enter your credentials at:
https://oms.tornierblueprint.com/auth/login or go to **shoulderblueprint.com** and click "Sign In" near the top of the home page on the right side of the screen.

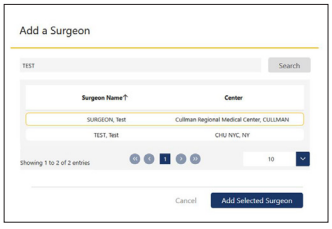
Adding an ordering physician to your upload list

Step 1:
Navigate to the "DICOM upload" tab from the left-hand menu, and search for the ordering physician by clicking "add a surgeon."

Note:
Search ordering physician by last name and verify their "center."

Note:
Searches can take up to 60 seconds to complete.





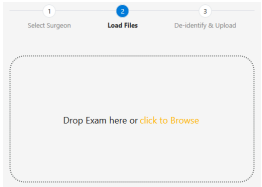
Step 2:
Select the ordering physician's name and click:

Add Selected Surgeon

Uploading a DICOM to the ordering physician's Blueprint account

Step 1:
Select the ordering physician's name from the "Select Surgeon" list, then click Next Step

Step 2:
Drag and drop on the screen or upload the patient's DICOM file from your computer.



Important:
Files must be unzipped, extracted or uncompressed to be uploaded. Drag and drop functionality is not compatible with using Internet Explorer. Use Google Chrome or Mozilla Firefox.

Step 3:
After the DICOM files are selected, click:

De-identify & Upload →

Step 4:
Confirm you are uploading the correct patient and study to the correct surgeon and click:

Confirm

Do not close the browser until the upload is complete!

Once the upload is complete, the files are automatically pre-processed for 3D reconstruction errors and sent to the surgeon's Blueprint account.

Note:
- **Only the thin 1.00 mm (or thinner) DICOM axial images can be uploaded through the cloud.**
- **No JPEG images will be accepted.**
- **No reformatted images will be accepted.**
- **If MAR was used, upload only that axial series.**

stryker

This document is intended solely for the use of healthcare professionals. A surgeon must always rely on his or her own professional clinical judgment when deciding whether to use a particular product when treating a particular patient. Stryker does not dispense medical advice and recommends that surgeons be trained in the use of any particular product before using it in surgery.

The information presented is intended to demonstrate the breadth of Stryker's product offerings. A surgeon must always refer to the package insert, product label and/or instructions for use, including the instructions for cleaning and sterilization (if applicable), before using any Stryker product. Products may not be available in all markets because product availability is subject to the regulatory and/or medical practices in individual markets. Please contact your Stryker representative if you have questions about the availability of Stryker products in your area.

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