

# Blueprint®

## Scan protocol



# Blueprint

## Scan protocol

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# 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 surgery utilizing the Stryker portfolio.

The thin axial slices should be uploaded to the ordering physicians Blueprint via the Blueprint Cloud.

Please refer to page 9 for full instructions.

Should the uploader not be able to isolate the thin axial series, please upload the entire scan.

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

### United States support

Email: [blueprint\\_us@stryker.com](mailto:blueprint_us@stryker.com)

Phone: +1 (855) 378-1459

Managed 8:00 AM-5:00 PM CST

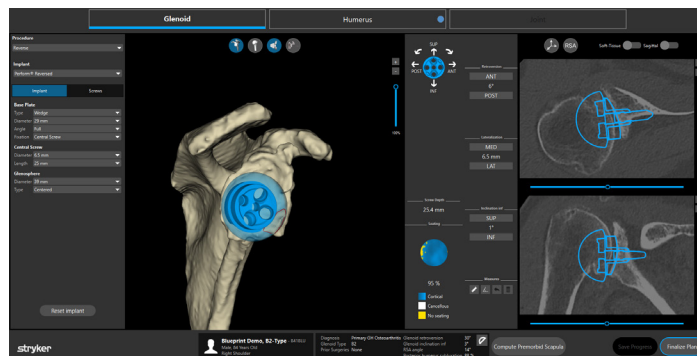
### International support

Email: [blueprint\\_ous@stryker.com](mailto:blueprint_ous@stryker.com)

Phone: +33 (0)4 76 52 80 56

Managed 9:00 AM-6:00 PM CET

If you would like to see what else we are accomplishing at Stryker utilizing the Blueprint software, please visit **[www.shoulderblueprint.com](http://www.shoulderblueprint.com)**, or if international, please refer to **[stryker.com](http://stryker.com)**.



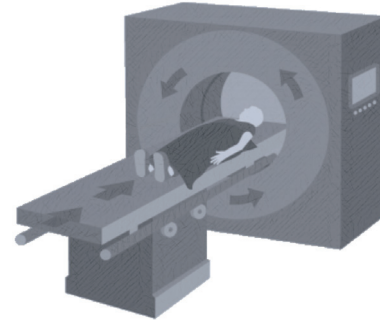
# Patient preparation and scan instructions

## Patient prep

Place patient head-first 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.

Isocenter 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;  
Head-first supine**

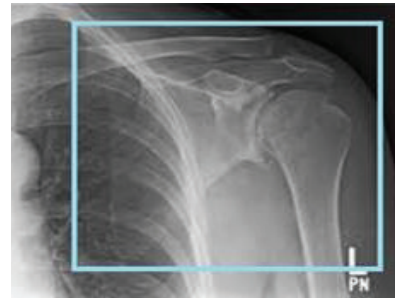
## Breathing instructions

Patient should hold their breath for the scan acquisition time. If a breath hold is not possible, shallow breathing is allowed.

## 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 included 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 included 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.**

### NOTICE

Blueprint can accept axial slice thickness up to 1.25 mm. We recommend that the axial slice thickness does not exceed 1 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 included 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 included 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 - 32 cm                     |
| Bits allocated    | 16                             |

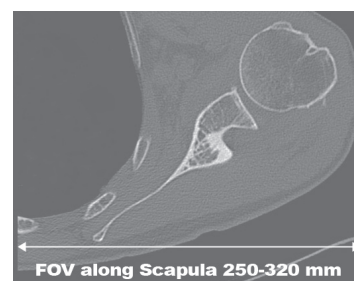
**Set DICOM tag "study description" to "Blueprint thin axials."**

### NOTICE

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 included 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 included 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 - 320 mm                                                              |
| Bits allocated    | 16                                                                        |

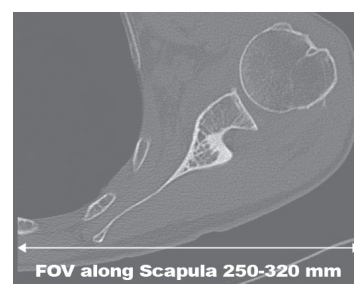
**Set DICOM tag “study description” to “Blueprint thin axials.”**

### NOTICE

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 included 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 included 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**
- **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<br>(depending on your scanner) |
| 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                                        |
| DFOV              | 250 - 320 mm                                     |
| Bits allocated    | 16                                               |

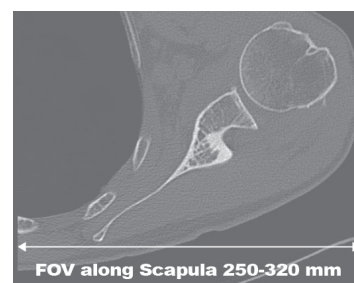
**Set DICOM tag "study description" to "Blueprint thin axials."**

### NOTICE

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 included 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 included 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**
- **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.

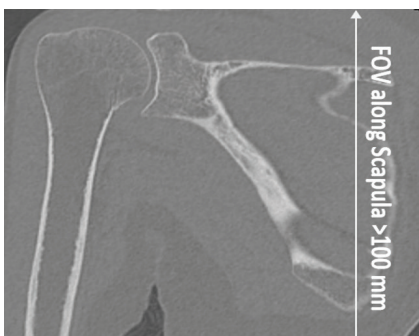
**If MAR is not available, increase KVP to 140.**

| Parameter           | Setting                |
|---------------------|------------------------|
| Modality            | Body                   |
| Collimation         | 64 x .625              |
| Kernel /algorithm   | Bone                   |
| KVP                 | 120 or 140             |
| mA                  | Auto                   |
| Thickness/increment | 1 mm x 1 mm or thinner |
| Detector coverage   | Maximum                |
| Pitch               | 0.8                    |
| Rotation time       | 1                      |
| Exposure time       | 1000 ms                |
| Matrix              | 512 x 512              |
| DFOV                | 250 - 320 mm           |
| Resolution          | High                   |
| Filter              | Sharp                  |
| Bone window         | Set a preferred window |
| Bits allocated      | 16                     |

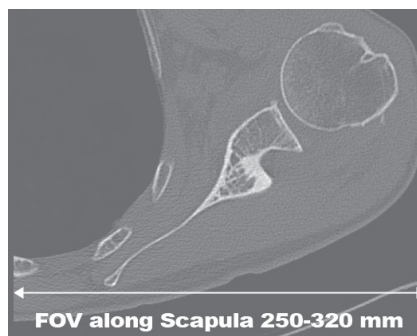
**Set DICOM tag "study description" to "Blueprint thin axials."**

### NOTICE

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 should be uploaded directly into the ordering physician's Blueprint account via our 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](https://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 the Blueprint Online Management System (OMS)

### Step 1:

Use Google Chrome as your browser.

Enter your credentials at:

<https://oms.tornierblueprint.com/auth/login> or go to [shoulderblueprint.com](https://shoulderblueprint.com) and click "Surgeon OMS login" at the top of the screen to direct you to the proper page.

## Adding an ordering physician to your DICOM Upload Page

### Step 1:

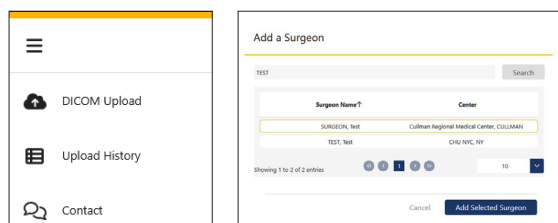
Navigate to the "DICOM upload" tab from the left-hand menu, and search for the ordering physician by clicking "add a surgeon."

#### NOTICE

Search ordering physician by first or last name only and verify their "center".

#### NOTICE

Searches can take up to 60 seconds to complete.



### Step 2:

Select the ordering physician's name and click:

**Add Selected Surgeon**

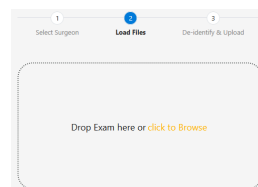
## Uploading a DICOM file to the ordering physician's Blueprint account

### Step 1:

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

### Step 2:

Drag and drop the file to the screen or upload the patient's DICOM file from your computer.



### Important:

**Files must be unzipped, extracted or uncompressed to be uploaded. Google Chrome is recommended for the drag and drop functionality.**

### 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 and will subsequently be available in the surgeon's account and upload history.

#### NOTICE

- Only thin-slice DICOM axial images can be uploaded via the cloud. Slice thickness must be  $\leq 1.25$  mm, with  $\leq 1.00$  mm strongly recommended.
- No JPEG images will be accepted.
- No reformatted images will be accepted.
- If MAR was used, upload only that axial series.

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