

## Image Transmission

Only X-rays of patients receiving Zimmer Biomet implants should be transferred upon completion of this protocol.

## Protocol Elements

DICOM Field Name	DICOM Tag	Content
Referring Physician Name	0008, 0090	Orthopedic Surgeon (Complete Last Name, Complete First Name)
Patient Name	0010, 0010	Last Name, First Name, Middle Name
Patient Date of Birth	0010, 0030	YYYY/MM/DD <sup>†</sup>
Gender	0010, 0040	M or F
Imager Pixel Spacing	0018, 1164	Value less than 0.5mm (<0.25mm is recommended)

<sup>†</sup> Your preferred date format (MM/DD/YYYY or DD/MM/YYYY) may be used in this field

### Please choose one:

Study Description	0008, 1030	For Left Knee, specify: ZBKNEEL For Right Knee, specify: ZBKNEER
Protocol Name	0018, 1030	

## Machine Parameters

### SID (Source to Image Distance)/FFD (Focus to Film Distance)

A distance of 72 inches (180 cm) is recommended and must be set to the fixed value during the entire study. It is recommended to use the same standard fixed value for every patient.

- Make sure this value is annotated on the image.

### Laterality

- When possible, laterality should be included in the image information DICOM tag (0020, 0060). Laterality (left or right marker) should always be annotated on the images.

## Patient Preparation

### Step 1: Position the X-ray Calibration Straps. Refer to Figure 1.

- Wrap one strap firmly around the thigh. The strap should be at least 4 inches (10cm) above the knee joint.
- Wrap another strap firmly around the calf. The strap should be at least 4 inches (10 cm) below the knee joint.

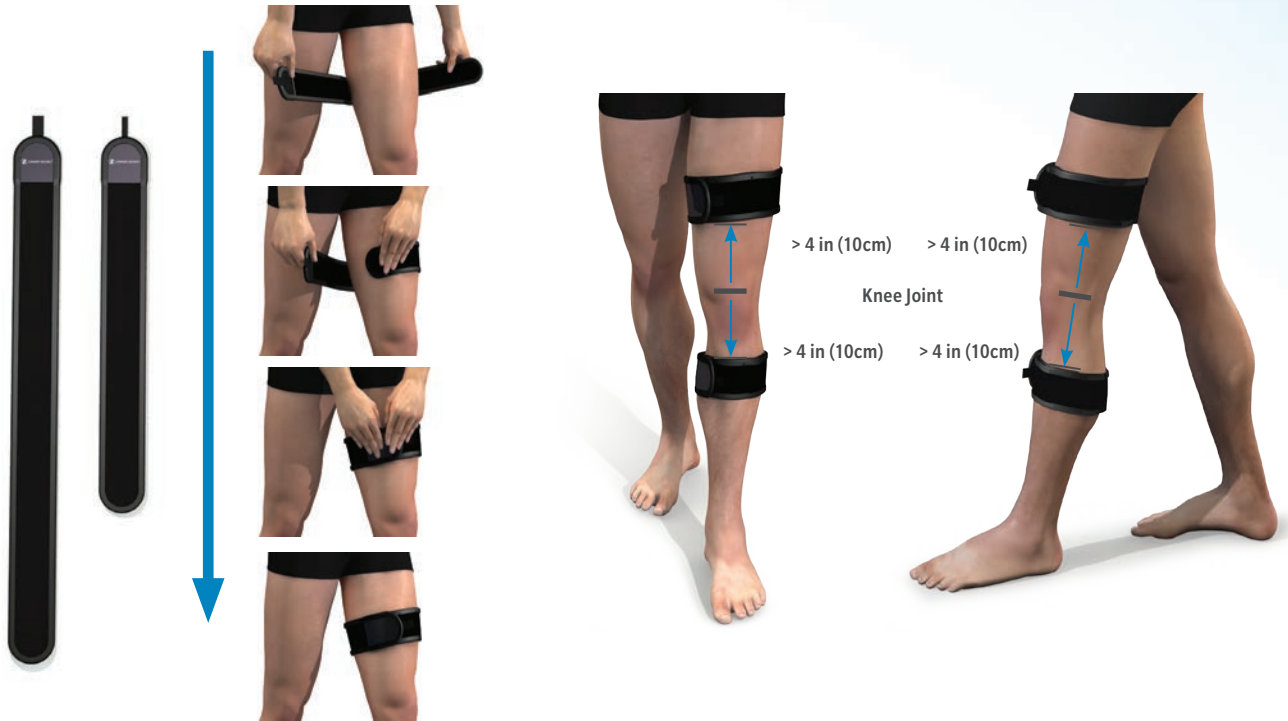


Figure 1: Positioning of X-ray Calibration Straps

### Step 2: Position the X-ray Markers 3D. Refer to Figures 2 and 3.

- Place both X-ray Markers 3D at about 45 degrees relative to patient's midline.
- The Zimmer Biomet logo should be oriented horizontally.
- The X-ray Markers 3D need to stay in place during the imaging process and while changing patient's position from AP to Lateral.

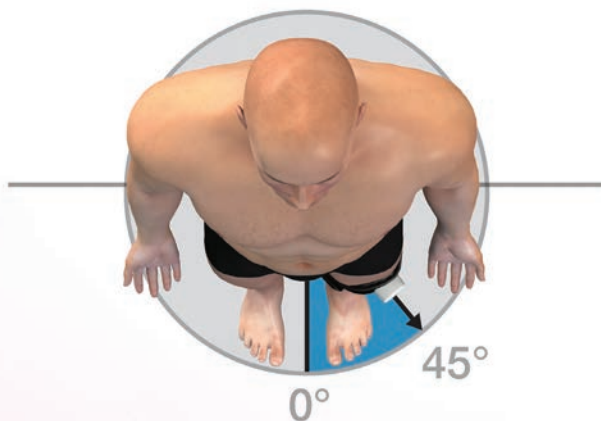


Figure 2: Position X-ray Marker 3D at 45° relative to patient's midline



Figure 3: Zimmer Biomet logo is horizontal

## Patient Positioning and Image Acquisition

Position patient in standing position with leg in extension and minimize the distance between patient and the X-ray detector.

### AP Image

Place patient in the frontal position facing the X-ray source and take AP image of the region of interest by one of the following methods of image acquisition:

- **Full leg length image acquisition:** Cover the entire operative leg from above the femoral head to below the ankle joint.
- **Source-tilting image acquisition:** Acquire 3 separate images to cover entire anatomy from above the femoral head to below the ankle, including:
  1. Hip image with cephalic angle
  2. Perpendicular knee image
  3. Ankle image with caudal angle

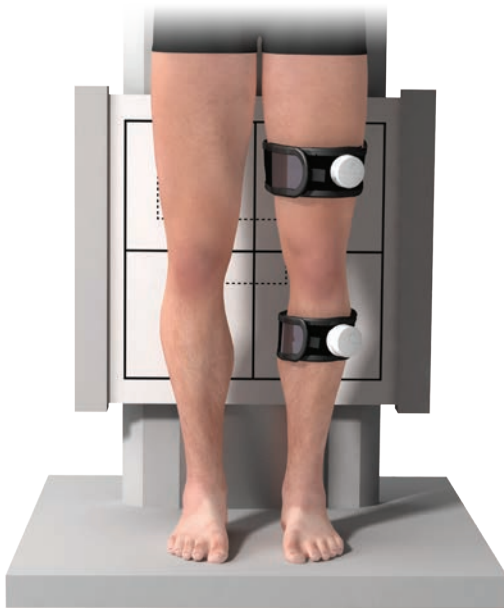


Figure 4: Patient Position for AP Image

### Lateral Image

Place patient in true lateral knee position and take lateral image of region of interest by one of the following methods of image acquisition:

- **Full leg length image acquisition:** Cover the entire operative leg from above the femoral head to below the ankle joint.
- **Source-tilting image acquisition:** Acquire 3 separate images to cover entire anatomy from above the femoral head to below the ankle, including:
  1. Hip image with cephalic angle
  2. Perpendicular knee image
  3. Ankle image with caudal angle



Figure 5: Patient Position for Lateral Image

### ⓘ Important:

- Prevent patient movement between sequential images in AP or Lateral.
- The femoral head contour and ankle must be clearly discernable on both images.
- The entire X-ray Marker 3D should be visible on the AP and Lateral images.
- No repositioning of the X-ray Marker 3D is permitted between acquisitions.
- No X-ray tube translation: Height of tube should remain perpendicular to the knee for entire exam. X-ray tube should only be angled cephalically or caudally for source-tilting image acquisition.

## Stitching

If the image acquisition is done by acquiring several separate images, adequate overlap between images is required for accurate stitching. Stitching by the scan center is optional, but it is only acceptable with automatic image stitching software. All acquired images (full leg images, if any, and separate leg image acquisitions in AP and Lateral) should be sent to Zimmer Biomet.

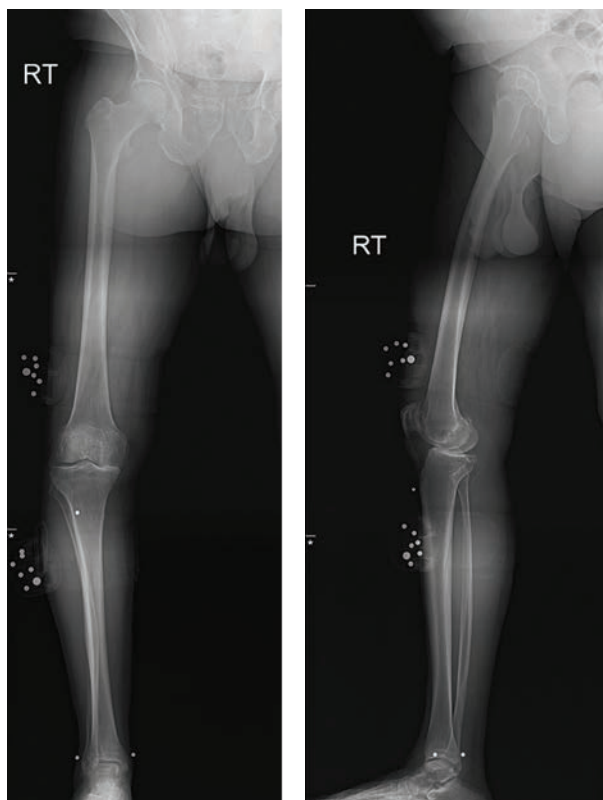


Figure 6: Example of good X-rays

**The Scan Tech should evaluate the images for the following before the image transfer:**

### **Visibility of all required anatomy:**

- Femoral head contour
- Ankle
- Entire knee joint
- Tibial tuberosity
- Visibility of entire X-ray Marker 3D on both the AP and Lateral images

**The following machine and patient parameters are recorded correctly and are the same for all images in the DICOM tags:**

- Imager pixel spacing
- Patient gender (male/female)
- Surgeon name
- Patient name or Zimmer Biomet Patient ID

**The following parameters MUST be annotated on each AP and Lateral image:**

- SID/FFD
- Laterality (left/right)

See further documentation referenced in 3759.1-GLBL-en X-Atlas® Image Acquisition Protocol for ROSA® Knee System.

## Personalized Solutions Customer Support

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2535.4-GLBL-en-Issue Date 2022-08

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