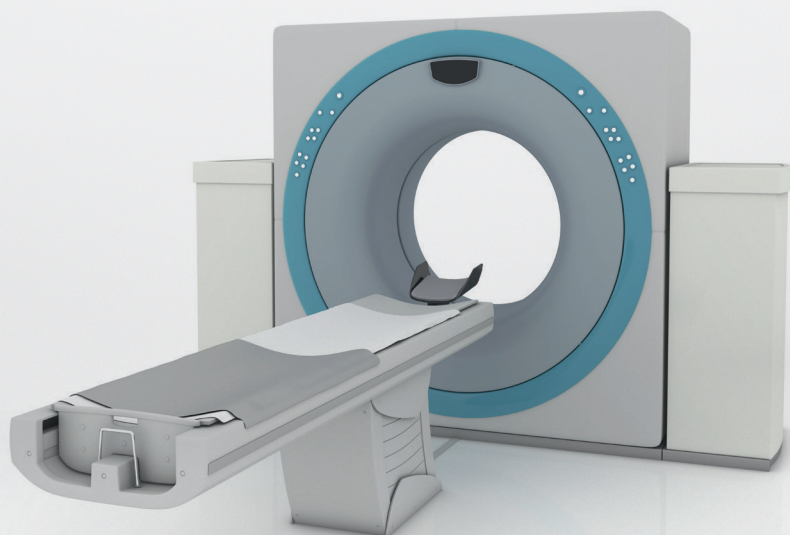


# KNEE-PLAN<sup>®</sup>

CT scan protocol



 **symbios**  
custom-made for you

## Document objective

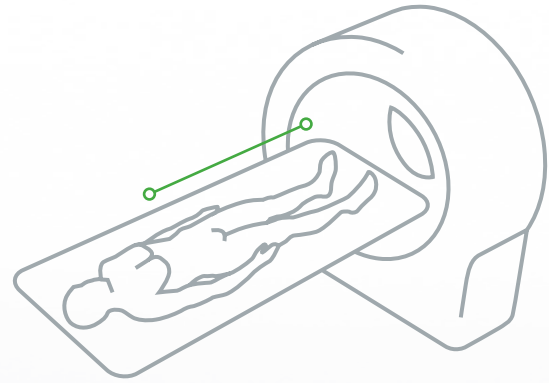
This document specifies the protocol for the acquisition of CT images that are compatible with the KNEE-PLAN® 3D knee planning software. When combined with Symbios standard implants, the KNEE-PLAN® allows orthopaedic surgeons to plan and reconstruct their patients with an increased accuracy<sup>(1)(2)(3)</sup> compared to conventional x-ray templating.

As the accuracy of the KNEE-PLAN® relies on the CT images that have been acquired, it is essential to follow as closely as possible the parameters described in this protocol, even though it might differ from knee imaging protocols routinely used by your institution for diagnosis purpose.





## Patient's position

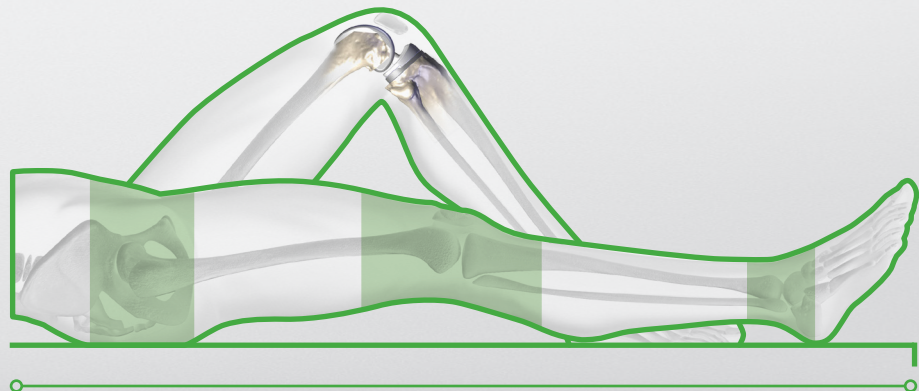


1

The patient should be supine with the feet forward.

2

The legs of the patient should be extended and aligned to the table axis. In case of metallic prosthetic material on the opposite side, maintain the opposite leg flexed knees farthest from each other to avoid the presence of artifacts on the CT imaging.



COURSE RANGE TO BE COVERED  
DURING ACQUISITION

3

Check that the maximum course range of the table is sufficient to allow an examination starting from the top of the pelvis to the foot on the side to be operated.

**Important:** It is essential that the patient is comfortably settled in order to prevent motion during the examination. Cushions and straps may be used to maintain the patient's position.

## Image series

The protocol consists of a **single acquisition composed of three separate spiral scans**. The three reconstructed series should be axial and should provide **slices that are adjacent**.

	Series	Slice thickness and spacing (mm)	Reconstructed FOV (mm)	Resolution (px)	Voltage (kV)
	HIPS	1.25 to 2 mm	500	512 x 512	120
	<b>RIGHT / LEFT KNEE</b>	<b>0.5 to 0.8 mm</b>	200	512 x 512	120
	RIGHT / LEFT ANKLE	1.25 to 2 mm	200	512 x 512	120
	SCOUTVIEW FRONT	-	-	-	-
	SCOUTVIEW PROFILE	-	-	-	-

**Note:** Both frontal and sagittal scout views (topograms) are required for the proper use of KNEE-PLAN®, and they should be performed with the highest possible resolution.

## Scanner settings

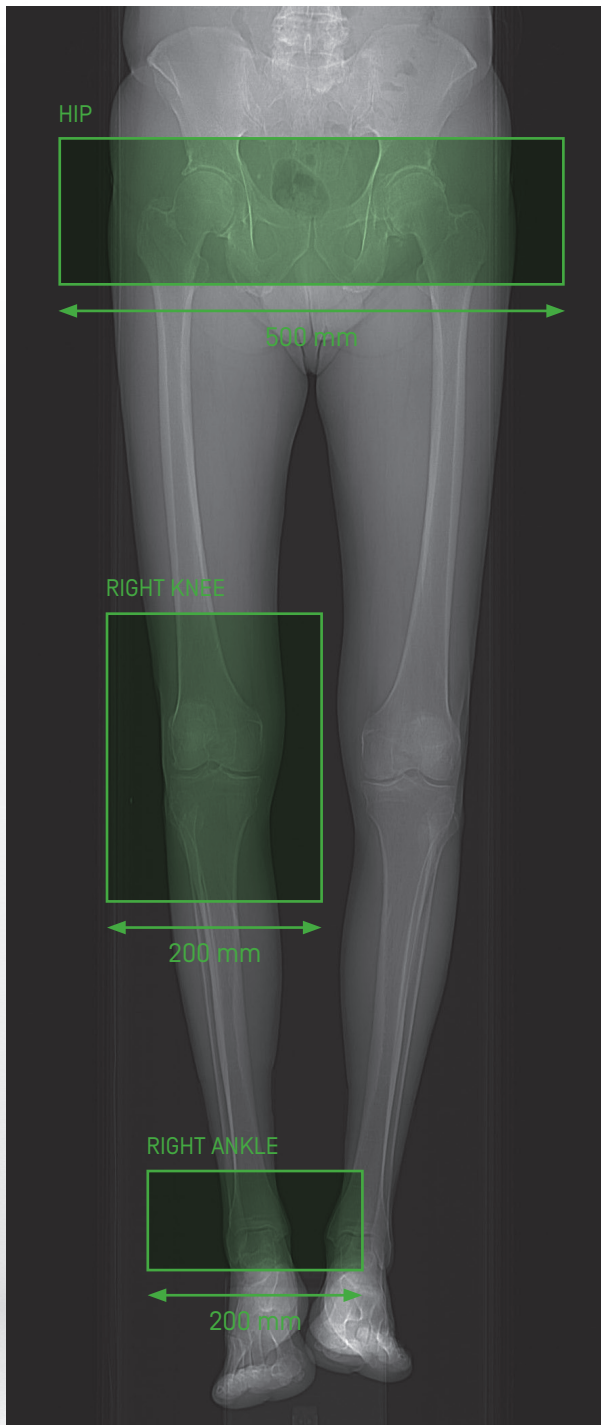
Acquisition mode	Spiral
Collimation and Pitch parameters	Define parameters as to allow a reconstruction with the lowest slice thickness as possible* (max. 0.8 mm)
Reconstruction kernel for soft tissue**	GE Healthcare <b>Detail</b>
	SIEMENS <b>B31</b>
	TOSHIBA <b>FC13</b>
	PHILIPS <b>B</b>
Images resolution	512 x 512 pixels
Voltage	120 [kV]
Charge (mAs)	Adapted to avoid artifacts according to the patient's morphology

[\*] The minimum slice thickness can vary from a machine model to another according to the parameters that are set. However, the expected optimal thickness should be in between 0.5 mm and 0.8 mm.

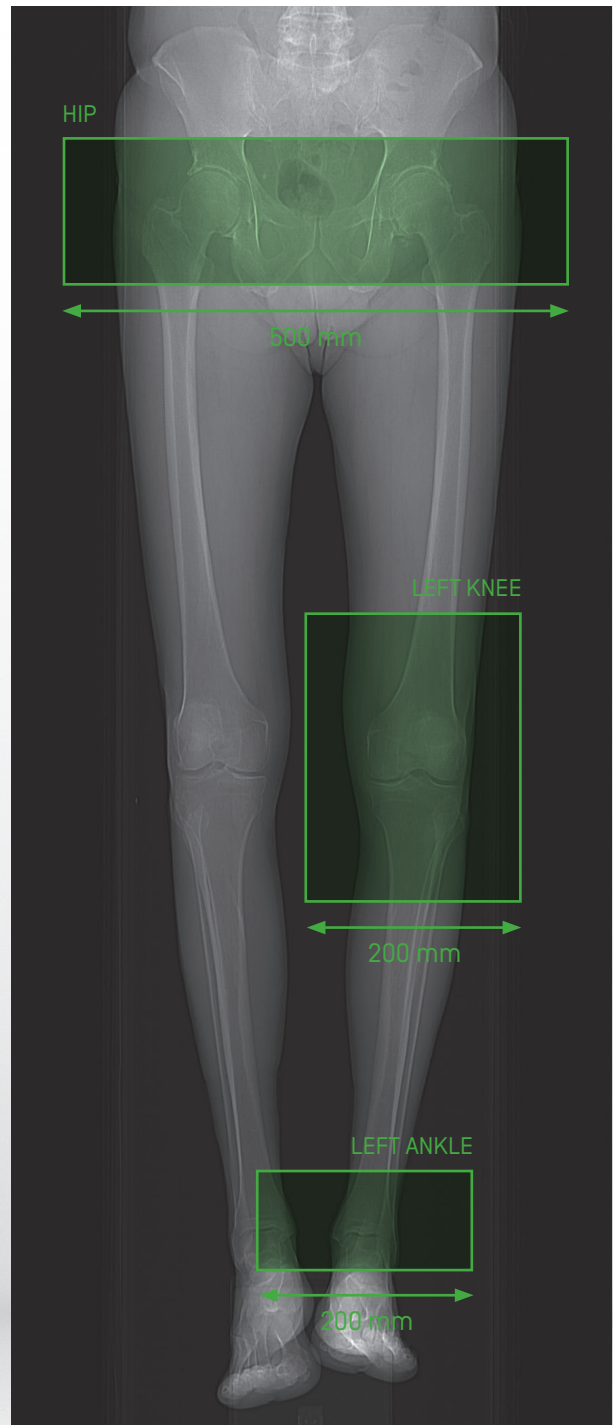
[\*\*] For better imagery quality (noise reduction), the reconstruction filter for soft tissue is recommended.



Right knee protocol



Left knee protocol



**Important:**

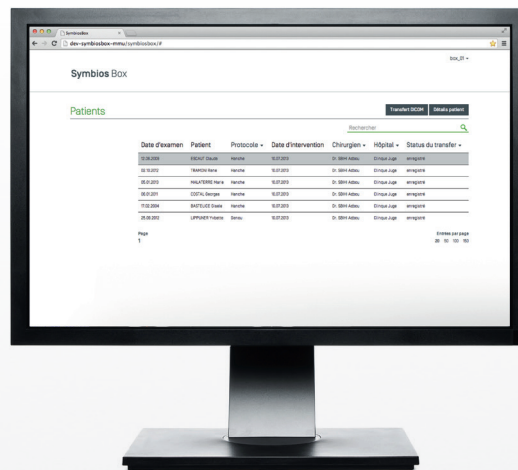
Adhere to the series as indicated above, particularly:

- HIPS series: Include the acetabulum as well as the entire femur head.
- KNEES series: Include the entire knee joint (10 cm above and below the joint).
- ANKLES series: Base the series around tibio-talar articulation.

# Sending images to Symbios

There are several methods available for sending scanned images to Symbios:

1



## Online [Symbios Box]

The most simple and effective method is to transfer the scanned images to Symbios via the Symbios Box. The Symbios Box is compatible with PACS/DICOM and is installed on the local area network (LAN) at your medical imaging center. This allows it to communicate with your PACS and to safely send DICOM type images to Symbios over the internet.

### Safer

The Symbios Box uses a highly sophisticated algorithm in order to encode the DICOM data during online transfer. Data confidentiality for your patients is guaranteed!

### Faster

Because the data is sent directly via the internet, we receive the DICOM images at Symbios in less than 20 minutes\*. We are therefore able to get a head start on designing custom-made implants for surgeons and their patients!

### Simpler

All you need is a regular internet browser (such as Chrome, Safari, Internet Explorer, Firefox, etc) to access the patient list and transfer the relevant DICOM images to Symbios. No more burning CD-ROMs!

For more information about the Symbios Box, contact your Symbios representative.

[\*] Time taken to send images online may change subject to image size and the speed of your internet connection.



2

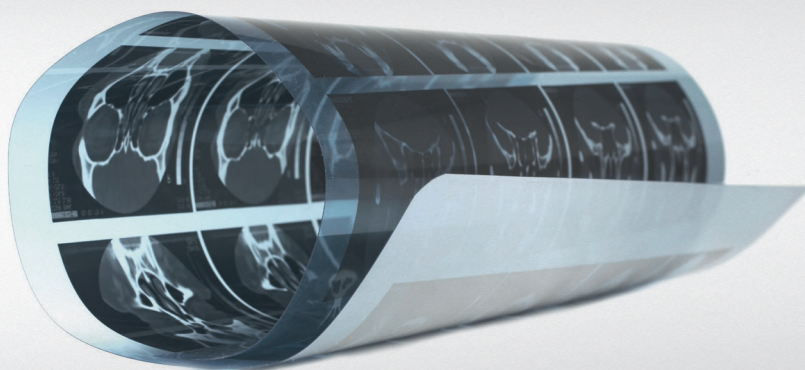
## In person or by post [CD-ROM]

You can save the DICOM images onto a disk [CD-ROM or DVD-ROM] in uncompressed format and give them to your Symbios representative yourself or send them by post to the following address:

**Symbios Orthopédie SA**  
**Custom Knee Department**  
Avenue des Sciences 1  
1400 Yverdon-les-Bains  
Switzerland

### Data confidentiality

Symbios undertakes to respect the confidentiality of the patient's data, and to return it if requested.



## References

**[1] Accuracy of the knee reconstruction with personalized three dimensional preoperative planning and custom cutting guides for total knee Arthroplasty.**

Franceschi J-P, Sbihi A, Leclercq V.

Orthop Traumatol Surg Res 2012, vol 98, n°7S: S338-S339, 2012.

**[2] Total knee Arthroplasty : do custom cutting blocks improve mechanical axis reconstruction?**

Vauclair F, Polic N, Aminian K, Jolles B.

Orthop Traumatol Surg Res 2012, vol 98, n°7S: S339-S340, 2012.

**[3] Intérêt des guides de coupe sur mesure après une planification préopératoire scanner 3D dans la mise en place d'une prothèse totale de genou.**

Pasquier G, Franceschi J-P, Sbihi A, Leclercq V, Plé J.

Maîtrise Orthopédique n°218, novembre 2012.

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