Galapagos/Servier CL2-201086-002/ GLPG1972-CL-201

Quick Reference Guide for MR Image Acquisition of the Knee

Siemens 1.5T Scanners (US Sites)

MRI Visits

W000 [Inclusion][1]

W028

W052

WD [Premature Withdrawal][2]

1 The inclusion MRI is the MRI at baseline. it should be performed after getting results of screening criteria (lab, ECG, X-Ray) and before the first study drug intake

2 To be performed only if the previous qMRI (W000 or W028) is done ≥ 2 months before the premature withdrawal

MR Imaging Protocol

For each subject, a single knee will be designated as the index knee for imaging.

Standard Protocol - At visit W000, 28 and 52 and WD.

The imaging exam should be carried out as follows.

1. **3-Plane Localizer(s)**
2. **Sagittal 3D T1-w GRE WE/FS**
3. **Coronal 2D PD-w FSE fat sat**

Test-Retest Protocol - Only for one of the first 3 subjects, preferably the 3rd, will be scanned 2 times at W000 and W052 or WD if the Subject discontinues from the study.

The imaging exam should be carried out as follows.

1. **3-Plane Localizer(s)**
2. **Sagittal 3D T1-w GRE WE/FS**

***Take the subject off the table.**

3. **3-Plane Localizer(s) retest**
4. **Sagittal 3D T1-w GRE WE/FS retest**
5. **Coronal 2D PD-w FSE fat sat**

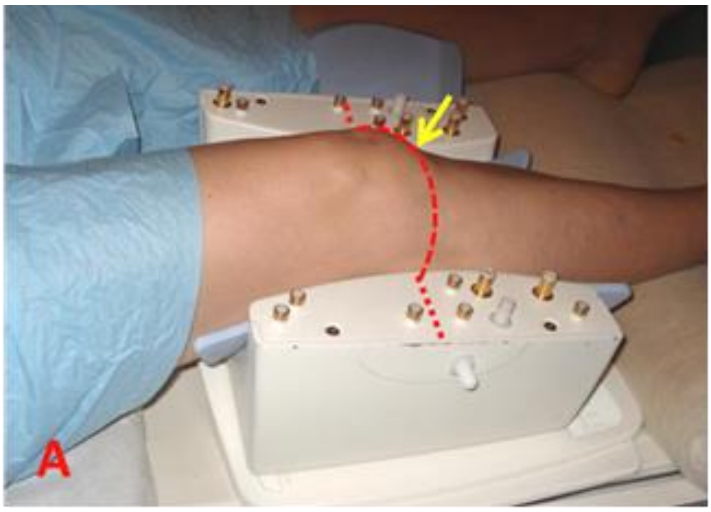
*Upon acquiring sequence 2, image acquisition should be stopped. The subject should then be taken out of the table and allowed to rest for 2-5min. After that, the subject should again be placed on the table and the target knee secured inside the coil. The imaging session should be continued by acquiring new localizer sequence(s) followed by sequences 4 and 5. **All acquired sequences (pre- and post-repositioning) should be submitted to Bioclinica as a single imaging exam!**

The entire protocol should be programmed into your scanner and saved as ***Galapagos/Servier CL2-201086-002/GLPG1972-CL-201*** at beginning of this clinical trial. Once approved by Bioclinica, this protocol should be recalled and used without alteration for each examination.

Subject Preparation and Positioning

Proper subject preparation is critical for obtaining high-quality images. Follow these guidelines and make sure to consistently cover all preparatory steps during each subject-visit.

- The laterality of the target knee for imaging should correctly be entered through the scanner console.
- All loose metal objects should be removed as well as metal-containing jewelry and clothing (zippers, belts, snaps). It is recommended that the subject be dressed in a hospital gown.
- The head-phones should be used if available. Alternatively, provide the subject with earplugs and make sure he/she can hear your comments during imaging.
- Subject positioning inside the scanner should be Feet First Supine (FFS).
- In the coil the knee should be positioned so that that the apex of the patella is aligned with the center of the coil (A).
- The leg should be in a relaxed, neutral position. The most comfortable (and sustainable) one is attained when the knee joint is slightly flexed. Many coils are designed to accommodate this. However, if the base of your coil is flat, use the pads/pillows to slightly elevate and flex the knee.
- Once the knee is comfortably oriented and centered inside the base of the coil, attach the top (B). Use pads as needed to immobilize the knee (C).
- Position the coil as close as possible to the center of the table. To achieve this, offset the patient toward the contralateral side.
- Be sure to keep the non-target knee away from the target knee. Have the patient flex and elevate the non-target knee, then put padding under non-target knee to keep it higher (more anterior) than the target knee.
- Provide the subject with blanket(s) and pads, as needed, to ensure comfort and immobility during imaging.
- When moving the table inside the scanner, use laser lights to zero in at the center of the coil (apex of the patella).
- During imaging monitor the subject at all times.

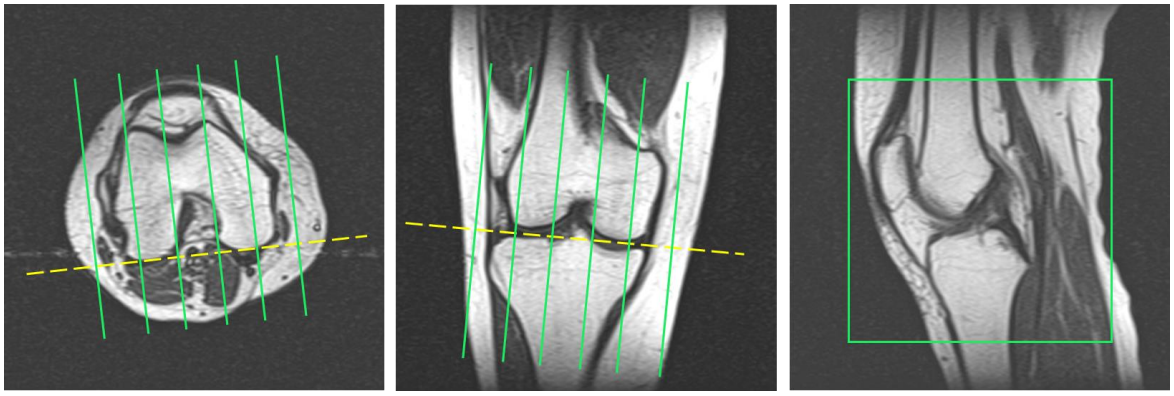


Anatomical Coverage and Slice Prescription

Presented below are the slice prescription and anatomical coverage for each required sequence. Complete coverage of the knee joint, including patella, is required. If the protocol-recommended number of slices is not enough to attain complete coverage, add as many slices as needed. The protocol-specified FOV dimensions should not be altered!

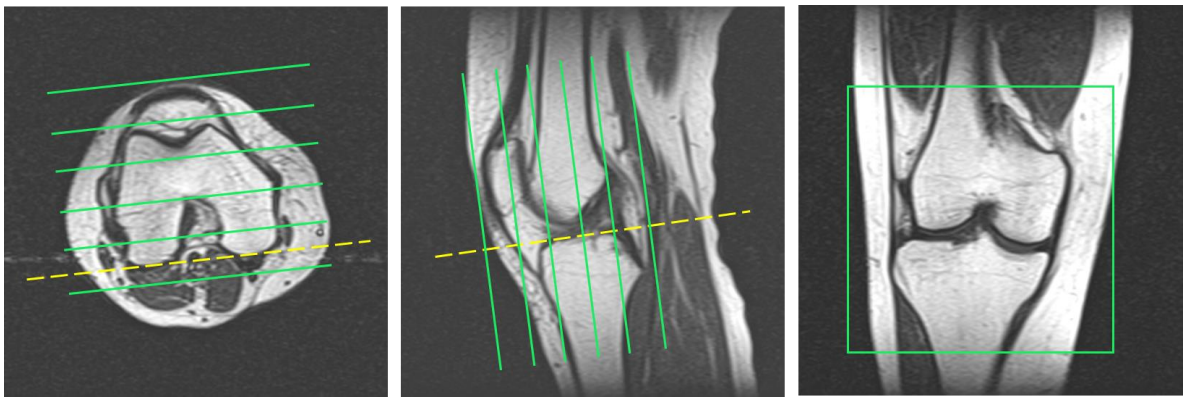
Sagittal 3D T1-w GRE WE/FS

- Based on the axial localizer find the slice with the largest cross-section through femoral condyles and identify the line connecting posterior surfaces of the condyles. The slices should be perpendicular to this line. Make sure the joint is well centered within the stack.
- Based on the coronal localizer prescribe the slices perpendicular to tibial plateau. The knee joint should be in the center of the stack.
- Based on the mid-sagittal localizer make sure the FOV is well prescribed and the knee joint, including patella, is covered. The imaging volume should include both femorotibial and patellar cartilage.



Coronal 2D PD-w FSE fat sat

- Based on the axial localizer find the slice with the largest cross-section through femoral condyles and identify the line connecting posterior surfaces of the condyles. The slices should be aligned (parallel) to this line.
- Based on the mid-sagittal localizer prescribe the slices perpendicular to the tibial plateau. The knee joint should be in the center of the stack and patella should also be included.
- Based on the coronal localizer make sure the FOV is well positioned and the femur-tibia joint is in the center of it.



Scanner Settings and Parameters - 1

To setup and save each sequence please refer to the table below. The sequences are based on suggested acquisition parameters that are typical for Siemens 1.5T MRI scanners. Depending on specific hardware/software versions, some settings may vary. Start with your routine clinical sequences and modify settings as indicated below. The imaging protocol for your scanner should be saved at study initiation and subsequently used for all subjects. Consistency in acquisition across all visits is especially important!

Interface card	Parameter name	Sagittal 3D T1-w FLASH WE/FS	Coronal 2D PD-w FSE fat sat
Routine	Sequence file	***fl3d1**	***tse2d1**
	Orientation	Sagittal	Coronal
	Phase encode dir.	A>>P	R>>L
	Phase oversampling [%]	0	0
	Slice oversampling [%]	0	0
	Slice groups	NA	1
	Slices	NA	36
	Slabs	1	NA
	Slices per slab	76	NA
	FOV read [mm]	160	160
	FOV phase [%]	100	100
	Slice thickness [mm]	1.5	3
	Distance factor [%]	NA	10
	TR [ms]	18 - 25	3500 - 4500
	TE [ms]	6 - 9	35 – 45
	Averages	1	1
	Concatenations	NA	1
Contrast common	Flip Angle [degree]	15	NA
	Water Excitation	On-Fast	NA
	Fat Suppression	OFF	ON
	Base resolution	512	256
	Phase resolution [%]	100	100
	Slice resolution [%]	100	100
	Phase partial Fourier	Off	Off
	Slice partial Fourier	Off	Off

This table is continued on page 6.

Scanner Settings and Parameters - 1

The table below is the continuation of the table on page 5.

Interface card	Parameter name	Sagittal 3D T1-w FLASH WE/FS	Coronal 2D PD-w FSE fat sat
Contrast iPAT	PAT Mode	None	Default settings
Resolution	Imaging mode	3D	2D
	Filter	Norm	2D Distortion correction
	Interpolation	None	None
Geometry common	Multi-slice mode	NA	Interleave
Sequence Part 1	Bandwidth [Hz/px]	120-180	120-180
	Flow comp	On in frequency direction	None
Sequence Part 2	Turbo Factor	NA	9 - 15
	RF pulse type	Normal (Fast)	Normal (Fast)
	Gradient mode	Normal (Fast)	Normal (Fast)
	Asymmetric echo	On (if available)	OFF
	RF spoiling	Default setting	Default setting
	Scan time [min]	9 – 14	3-4

This is the end of the table.

Entering Subject Data in Electronic Header

To ensure patient confidentiality, please enter the following information into the electronic MRI header:

- "**Subject Information**" enter the 4-digit Site Number followed by the 5-digit Screening Number

  EXAMPLE: 0010-00010

- "**Date of Birth**" enter *01-Jan-YYYY*. The day and month for each subject should be entered as 01-Jan followed by the true birth year of a patient

  EXAMPLE: 01-Jan-1955

- "**Subject History**" enter: visit name and the laterality of the target knee

  EXAMPLE: W028, Right

The possible entries for Visit identification:

W000 [Inclusion]
W028
W052
WD [Premature Withdrawal]

Submitting Data to Bioclinica

The data to be sent from the imaging site should contain both the imaging study and the transmittal form. There are two options for sending data to Bioclinica:

- Electronic transfer using secure FTP website (Bioclinica Portal) - the preferred method of submission
- Postal mail/courier service.

Electronic Data Transfer Using Bioclinica Portal - preferred

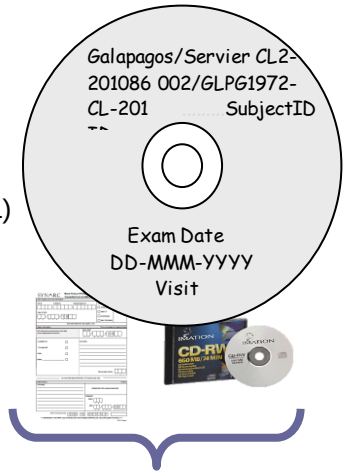
The Bioclinica Portal is a web-based portal that allows sites to submit images via secure file transfer protocol (FTP). It eliminates delays and expenses associated with shipping images via courier. The Transmittal Form (TF) is completed and submitted electronically as well.

Sending Data Using Courier Service

The complete package should contain a CD with imaging data and the completed TF.

Export the data to the CD in **uncompressed DICOM** format. Use an indelible marker to label directly on the CD with:

- Study Protocol Number (Galapagos/Servier CL2-201086 002/GLPG1972-CL-201)
- Subject Identifiers (Site Number and Subject Number)
- MRI Exam Date (DD-MMM-YYYY)
- Visit Name



Sending a Package to Bioclinica

1. Complete the sender sections of the air waybill, keeping a copy for tracking purposes.
2. Place the white and yellow copies of the TF and the CD for each patient into a shipping envelope. **Please keep pink copy at site.**
3. Call courier to schedule package pick-up.

Courier
to Bioclinica

Ship data to: Galapagos Study Team
Bioclinica Inc.
7707 Gateway Blvd., 3rd Floor
Newark, CA 94560 USA
Phone: +1-415-817-8900
Email: 10004976Support@Bioclinica.com