MRI: Checklist for image quality

**Centering**
The knee should be centered in the field of view (FOV) and if there is any coil cut-off on the images, this should be evenly distributed between superior and inferior margins of the FOV (Figures 1 and 2).

![Figure 1 VISIONAIRE Technology knee centered in FOV](image)
![Figure 2 VISIONAIRE Technology knee not centered in FOV](image)

**Motion**
No motion on the image set can be accepted. This includes motion that caused actual image quality degradation (Figure 3) and intra-acquisitional motion (Figure 4). Intra-acquisitional motion is motion between slices that causes the image data sets to be offset from one another. This cannot be accepted because we are using these images to create a 3D model, like an MRA. If this type of motion is present, then the slices will not align and accurate cutting blocks cannot be made.

Additionally, please review the images very carefully for motion as this could result in the need to bring the patient back for a rescan. If the patient cannot remain still during the scan, contact the ordering physician and/or your local Smith & Nephew sales representative. Please discuss with physician if steps can be taken to mitigate patient motion on a rescan.

![Figure 3 VISIONAIRE motion artifacts](image)
![Figure 4 Intra-acquisitional motion; part of axial reconstruction segmentation](image)
Offsets
The left or right offset of the acquired image can be no more than what your scanner was approved for. This location is measured from the center of the knee or center slice. Example: if your scanner is restricted to L/R 30mm, then we cannot accept an image set with the center slice at L-42.65 or 36.0mm.

3D correction filter
If your scanner has 3D distortion correction filters then the image data that is sent must have this applied.

S/N
The signal to noise must be good enough to visualize on all slices the cortical bone edge, the cartilage edge and the cartilage interface between the femoral and tibial cartilage.

Resolution
We must have the stated resolution on our protocols:
- 22cm FOV of 220mm FOV
- Slice thickness of 2mm
- Slice gap of 0 or interleaved

Acquisition matrix of 512 x 256; some scanners cannot achieve this and a little higher matrix is acceptable in those cases. ie: Newer Philips scanners can only get a matrix of 528 x 256 and this is acceptable.

The Reconstruction matrix must be 512 x 512, some scanners cannot achieve this and a little higher matrix is acceptable in those cases. ie: Newer Philips scanners can only get a matrix of 528 x 528 and this is acceptable.

Coverage
The scan must cover the entire bony knee. Smith & Nephew usually suggests 1 or 2 slices out of bone on either side. The images must be sagittal to the patient’s knee in all three planes. Many imaging centers neglect the axial localizer and submit rotated images. Patients are more comfortable in a slightly externally rotated position in the coil. The technologist must remember to oblique the FOV in this plane also to be sagittal to the knee. Scan slices should be obliqued so that the resulting slices are perpendicular to a line drawn across the posterior femoral condyles.