

## IMAGE PROTOCOL RECOMMENDATIONS

Ed. 112019

### SOFT TISSUES

**NOTE:** the quality of products provided by Visible Patient greatly depends on the quality of CT and MRI images you send us. In order to optimize the accuracy of the 3D model, we request thin slices, ideally millimetric and as often as possible  $\leq 2\text{mm}$ .

### MRI PROTOCOL

<b>ALL ANATOMICAL AREAS</b>	<b>Data Format</b>	<ul style="list-style-type: none"> <li>DICOM image series (<b>only native images</b>)</li> </ul>
	<b>Scan Range</b>	<ul style="list-style-type: none"> <li>Targeted organ must be entirely covered</li> </ul>
	<b>Spatial resolution</b>	<ul style="list-style-type: none"> <li>High spatial resolution</li> <li>Slice thickness <b>as thin as possible</b> (ideally <math>\leq 2\text{mm}</math>)</li> </ul>
	<b>Further Recommendations</b>	<ul style="list-style-type: none"> <li>Phased array surface coils (torso)</li> <li><b>Good signal/noise ratio</b></li> <li>Avoid breathing or motion artifacts</li> <li>Avoid unnecessary metal artifacts</li> <li>Patient should have identical position throughout all scans</li> </ul>
<b>Additional information per specialty</b>		
<b>ABDOMEN</b>	<b>Sequence required to make a 3D model</b>	<ul style="list-style-type: none"> <li><b>3D dynamic injected sequences EG T1 GADO fat sat (LAVA), 2 mm slice thickness, with 3 or 4 acquisition phases (without injection, arterial, venous and late injection)</b></li> </ul>
	<b>Sequences required to analyze images</b>	<ul style="list-style-type: none"> <li><b>T2 sequence</b></li> <li>EPI sequence (diffusion)</li> <li>T2 weighting SSFSE for biliary tract</li> <li>IP-OP according to the indication</li> </ul>

## IMAGE PROTOCOL RECOMMENDATIONS

Ed. 112019

### SOFT TISSUES

**NOTE:** the quality of products provided by Visible Patient greatly depends on the quality of CT and MRI images you send us. In order to optimize the accuracy of the 3D model, we request thin slices, ideally millimetric and as often as possible  $\leq 2\text{mm}$ .

### CT-SCAN PROTOCOL

<b>ALL ANATOMICAL AREAS</b>	<b>Data Format</b>	<ul style="list-style-type: none"> <li>DICOM image series (<b>only native images</b>)</li> </ul>
	<b>Scan Range</b>	<ul style="list-style-type: none"> <li>Targeted organ must be entirely covered</li> </ul>
	<b>Image resolution Pixel size</b>	<ul style="list-style-type: none"> <li>Slice spacing <math>\leq</math> slice thickness (contiguous slices)</li> <li>Slice thickness, image size and location of <b>DFOV constant</b> within each series</li> <li>Matrix size: 512 x 512</li> </ul>
	<b>Further Recommendations</b>	<ul style="list-style-type: none"> <li>Avoid breathing or motion artifacts</li> <li>Avoid unnecessary metal artifacts</li> <li>Good signal/noise ratio</li> <li>Targeted organ and neighboring vessels should be well contrasted (use bolus tracking)</li> <li>Patient should have identical breathing phase and position throughout all scans</li> </ul>
<b>Additional information per specialty</b>		
<b>LUNG</b>	<b>Image resolution - Filters</b>	<ul style="list-style-type: none"> <li><u>Soft</u> filter and <u>hard</u> filter images are mandatory:               <ul style="list-style-type: none"> <li>- <b>soft filter</b> =&gt; <b>0,5 to 2 mm</b> slice thickness</li> <li>- <b>hard filter</b> =&gt; <b>thin slices <math>\leq 1\text{mm}</math></b></li> </ul> </li> <li>Field limits: entire lung</li> </ul>
	<b>Injection time</b>	<ul style="list-style-type: none"> <li>Arterial time: use bolus tracking on the pulmonary trunk</li> </ul>
<b>LIVER</b>	<b>Image resolution - size</b>	<ul style="list-style-type: none"> <li><b>0,5 to 2 mm</b> slice thickness</li> </ul>

		<ul style="list-style-type: none"> <li>Field limits: from hepatic dome to below the kidneys</li> </ul>
	Injection time	<ul style="list-style-type: none"> <li><b>Arterial phase:</b> use bolus tracking from the beginning of the abdominal aorta. No contrast in the veins. <b>Mandatory to model arteries of the target organ</b></li> <li><b>Portal-venous phase: 50-60 sec.</b> after injection start <b>Mandatory to model liver segments</b></li> </ul>
ABDOMEN	Image resolution - size	<ul style="list-style-type: none"> <li><b>0,5 to 2 mm</b> slice thickness</li> <li>Field limits: from hepatic dome to below the kidneys</li> </ul>
	Injection time	<ul style="list-style-type: none"> <li><b>Arterial phase:</b> use bolus tracking from the beginning of the abdominal aorta. No contrast in the veins. <b>Mandatory to model arteries of the target organ</b></li> <li><b>Venous phase: 70 sec.</b> after injection start</li> </ul>
UROLOGY	Image resolution - size	<ul style="list-style-type: none"> <li><b>0,8 to 1,5 mm</b> slice thickness</li> <li>Field limits: the entire urinary system and kidneys down to the bladder</li> </ul>
	Injection time	<ul style="list-style-type: none"> <li><b>Arterial phase: 35 sec.</b> (or use bolus tracking placed at the beginning of the abdominal aorta) <b>Mandatory to model arteries of the target organ</b></li> <li><b>Venous phase: 90 sec.</b></li> <li><b>Excretory phase: 5 min.</b> (use a diuretic), in case of pathology of excretory ducts</li> </ul>