

Image quality in the multicenter setting can be greatly influenced by variances in acquisition protocols. These variances may be related not only to equipment manufacturer and model, but also technique.

The study may permit imaging per institutional standard-of-care. However, aligning image acquisition to established standards is essential for robust quality data.

The table below is provided as a guideline and overview for MRI Female Pelvis exams. Please refer to your site's specific MRI manufacturer's imaging protocols for the optimal scanning protocol.

The MRI Pelvis exam should contain, at a minimum, the following series:

- 1. 3-plane Localization Scan
- 2. Axial T1-weighted
- 3. Axial T2-weighted
- 4. Orthogonal high-resolution T2-weighted FSE
- 5. Diffusion Weighted Imaging (DWI) with ADC map
- 6. Dynamic Contrast Enhanced (DCE) T1-weighted

Exam and Patient Preparation			
Magnet Strength	1.5T or 3T		
Coil	Multicoil Array Coil	Endoluminal coils (endovaginal) allow high-resolution imaging but are limited by the small FOV. These have not been widely adopted because of patient discomfort and limitations in imaging large tumors, extension to pelvic organs surrounding the primary site, and lymphadenopathy.	
FOV	A small FOV that includes the entire pelvic anatomy of interest without introducing undesirable artifacts.	Adjust to patient body habitus.	
Patient Position	Supine	 Feet first, elevate knees with MR safe sponge/wedge for patient comfort. Patient upper extremities raised above head whenever possible. If not, arms by side with added padding between upper extremities and patient body. Avoid skin-to-skin and skin-to-bore contact using appropriate padding, as indicated by magnet vendor, to avoid thermal burns. 	
Contrast Injection	Dual-chamber power injector recommended Contrast Bolus = 0.1 mmol/kg Bolus Rate = 2 mL/s Saline Flush = 20 mL	Insertion of intravenous catheter in upper extremity prior to the start of imaging.	

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Slice Plane	Axial/Coronal/Sagittal planes (orthogonal to area of interest)	Scan direction based on site preference.
	Fasting for 6 hours prior to examination.	
	Glucagon administration (subcutaneously or intramuscularly) unless contraindicated.	
Additional Considerations	Anterior SAT bands over anterior subcutaneous fat help minimize phase-encoding artifacts.	Diminishes bowel peristalsis and improves quality of imaging.
	Installation of vaginal gel to separate the walls of the vaginal canal can improve visualization of a vaginal mass but is not required.	



Image Acquisition

Localization Scan	3-plane localization scan	
T1-Weighted (T1w) Sequence	Slice thickness ≤ 5.0 mm Gap ≤ 1.5 mm TR < 800 ms TE < 30 ms Flip angle = 90°	In staging for gynecologic malignancy, large FOV T1w images are used to evaluate the abdomen and pelvis for lymphadenopathy, hydroureteronephrosis, and osseous lesions.
T2-Weighted (T2w) Sequence	Orthogonal high-resolution Slice thickness ≤ 5.0 mm Gap ≤ 1.5 mm TR > 2000 ms TE > 60 ms Flip angle = 90°	 For evaluation of uterus or cervix: High-resolution long- and short-axis T2w imaging of the uterine body is used for localization of endometrial cancer and for determining the depth of myometrial invasion and clearly demonstrates zonal anatomy. Long-and short-axis imaging of the cervix is performed to show the local extent of the cervical cancer to identify parametrial invasion and to assess candidacy for trachelectomy (a fertility-sparing procedure) For evaluation of vulvar and vaginal cancers: High resolution, orthogonal T2w images in the axial and coronal planes are used for evaluation of the primary tumor.
Diffusion- Weighted Imaging (DWI) with ADC mapping	Slice thickness $\leq 5.0 \text{ mm}$ Gap $\leq 1 \text{ mm}$ TR $> 5000 \text{ ms}$ TE min Flip angles $90^{\circ} / 180^{\circ}$ High <i>b</i> -value $800-1,000$ s/mm ²	DWI assists in lesion detection and extent of disease evaluation, including metastases to the peritoneum or adnexa, myometrial invasion in endometrial cancer, and tissue characterization of ovarian masses.
Dynamic Contrast Enhanced (DCE) T1-Weighted (2D or 3D technique)	Slice thickness ≤ 5.0 mm Gap ≤ 1.5 mm TR < 800 ms TE < 30 ms Flip angle = 90° Fat Suppression Multiplanar (long & short axis) Multiphase	3D technique preferred

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References

- ACR–SAR–SPR Practice Parameter for the Performance of Magnetic Resonance Imaging (MRI) of the Soft-Tissue Components of the Pelvis, Res. 4 – 2015. <u>https://www.acr.org/-/media/ACR/Files/Practice-Parameters/MR-SoftTissue-Pel.pdf</u>, accessed March 26, 2021
- 2. MRI Exam-Specific Parameters: Body Module. <u>https://accreditationsupport.acr.org/support/solutions/articles/11000061022-mri-exam-specific-parameters-body-module</u>, accessed March 26, 2021.