

# MRI of the pregnant patient: Diagnostic and management challenges

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## **Safety/consent**

Most studies show no adverse effects on the fetus from prenatal MRI. Some animal studies have raised questionable concerns of teratogenesis, and extra caution during the first trimester may be appropriate. Gadolinium is teratogenic in animal studies, and the potential persistence of gadolinium in amniotic fluid is also theoretically worrying. Contrast enhanced MRI should only be performed for compelling indications. There is no regulatory or medicolegal requirement to obtain signed consent for the performance of MRI in pregnancy, although the ACR does *recommend* (but not mandate) that signed consent be obtained. If signed consent is not obtained, it is prudent to discuss the risks and benefits with the patient and document this discussion in the medical record or radiology report.

## **Technique**

Because of dielectric effects and theoretical safety concerns, MRI in pregnancy is probably better performed at field strengths of 1.5T or less. Multiplanar fast spoiled gradient-echo T1 (e.g., FMPSPGR, FLASH) and single-shot rapid acquisition with refocused echoes T2 (e.g., SSFSE, HASTE) weighted sequences allow breath-hold imaging and are usually sufficient. Steady state gradient echo sequences are an alternative for T2 weighted imaging. Oral Gastromark and Readi-Cat can be used for negative T1 and T2 enteral contrast. In later gestation, left lateral decubitus positioning may be necessary to prevent caval compression.

## **Applications**

MRI is increasingly used to evaluate pregnant patients with suspected appendicitis if ultrasound is inconclusive. A thickened appendix with surrounding fat-stranding indicates acute appendicitis, although identification of these signs may be difficult near term. MRI can also be used to assess other causes of acute abdominal symptoms during pregnancy. Proximal bowel dilatation with distal collapse indicates bowel obstruction. Unilateral perinephric fluid suggests forniceal rupture, either spontaneous or due to stones. Ureteral calculi are not well seen at MRI and CT or limited IVP may be preferred. Rare but distinctive pathologies specific to pregnancy include red degeneration of leiomyoma, massive ovarian edema, decidualized endometrioma, and theca lutein cysts.

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