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## Role of MRI: Fetal body imaging

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USG is the primary technique for fetal imaging due to its proven utility, availability and low cost. Technical and therapeutic advances have driven the development of fetal MRI which now plays an increasingly important role in the evaluation of sonographically complex or occult anomalies of the fetal body. MRI during pregnancy was initially being used for maternal and placental abnormalities. Modern fetal MRI began with the availability of T2W- ultrafast sequences which provides an excellent contrast declination between the fluid (CSF) and tissues (developing brain). Fetal MRI was initially primarily utilized for evaluation of the fetal brain-neurological abnormalities. Development of more ultrafast breath hold sequences like T1, diffusion, echo planar, led to the MRI evaluation of the fetal organs. Continued progressive works of various groups has added significantly to the further development of this technique. Fetal MRI now offers an unrivaled method for advanced detailed anatomic imaging with a high degree of flexibility in the image contrasts. All the fetal cavities are fluid filled and appear T1 hypointense, T2 hyperintense; mouth, nose, ear, GI tract including stomach, kidneys, UB, GB, trachea, lungs, ventricles, CSF spaces and amniotic cavity. The bowel meconium, pituitary, thyroid and liver appears T1 hyperintense. Robust use of bright blood imaging and dark blood imaging sequences also helps in fast imaging as vessels and heart can appear bright/dark based on different imaging sequences. Fast MRI sequences have overcome fetal motion, hence scanning with adequate slice thickness, resolution, quality and SNR is now feasible. Parallel imaging is a general method for reducing the time of data processing required to produce images by simultaneous data collection on multiple separate channels with total imaging time ~30-45 minutes. Standard MRI screening and consent is obtained and scan is performed without any IV contrast administered. Main fetal safety concerns are first trimester teratogenesis and acoustic damage. Although safety has not been positively established, hazards appear negligible and outweighed by diagnostic benefit. Hence, pregnant women in the second and third trimester can be reassured that MRI poses no known risk to the fetus. My presentation will elaborate on common indications, ultrafast MRI technique, normal fetal anatomy and major congenital anomalies. All radiologists involved in prenatal imaging should be aware of the applications, safety concerns and limitations of this evolving modality.

## Biography

Manohar Roda is a Board Certified Radiologist currently working as an Assistant Professor- Body Imaging with University of Mississippi Medical Center in Jackson, MS. He has immense expertise in whole body MRI with special interest in body, MSK, cardiac and fetal MRI. He is passionate about evaluation of complex fetal congenital abnormalities on MRI to help clinicians and families in planning further management during these complex situations to improve fetal and maternal well-being. He has interpreted more than 500 cases of fetal MRI while working in University of MS over last five years. He teaches radiology residents, fellows, maternal-fetal medicine fellows, radiology technicians to design protocol, perform and interpret fetal MRI's with focus on patient safety and diagnostic accuracy. He is one of the key imaging personnel at UMC in carrying forwards the fetal imaging program which is a well-coordinated multi-disciplinary team effort between MFM Department, Neuroradiology, Body Imaging Division and other relevant departments. He has completed Body MRI Fellowship in Radiology Department of Tufts Medical Center at Boston in 2009. He also completed Thoracic Fellowship in Radiology Department of M D Anderson Cancer Center at Houston in 2008. He has completed his Radiology Residency Program in 2002 from Ram Manohar Lohia Hospital, University of Delhi, India. During his Post-residency Tenure of five years, he worked with the best multimodality radiology centers. He completed his Medical Schooling in 1999 from Maulana Azad Medical College, University of Delhi, India.

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