

# MRI of the Bowel

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## Introduction

MRI of the bowel is a relatively recent development compared with the established techniques of contrast radiography, endoscopy, ultrasound and X-ray CT. It offers the potential of a multiplanar imaging method with multiple contrast mechanisms and an excellent safety profile for serial and repeat imaging. The development of bowel MRI techniques has, until recently, lagged behind the utilization of MRI in other body systems owing mainly to the inherent difficulties in imaging the bowel, but research efforts over the last 20 years have demonstrated that such imaging is feasible.

Early studies of bowel imaging were attempted in the 1980s but proved inadequate for clinical application owing to motion and susceptibility artefacts combined with limited signal and contrast performance. During the 1990s several pioneering studies were performed demonstrating the potential of MR e.g. in small bowel obstruction. At the same time there was a significant improvement in the capability of commercial MR systems with routine fast imaging techniques (offering a range of contrast) along with dedicated abdomino-pelvic receiver coils to improve overall signal to noise ratio (SNR). Digital control systems along with enhanced gradient and radio frequency (RF) subsystems underpinned these improved capabilities. System capabilities have been further enhanced in the early 21st century with parallel architectures allowing for extended volume coverage and further improvements sequence performance. The development of MR techniques for bowel imaging has benefited from and adapted some of the concepts and strategies devised for the older more established imaging methods.

*This presentation will address:*

- 1 Challenges for imaging the bowel
- 2 Recent relevant developments in MRI technology
- 3 Appropriate acquisition sequences
- 4 Intra luminal contrast agents
- 5 Small bowel MRI
  - a. Techniques
  - b. Clinical Validation
- 6 Large bowel MRI
  - a. Techniques
  - b. Clinical Validation
- 7 Future research

**References**

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