Practice Advisory on Anesthetic Care for Magnetic Resonance Imaging: An Updated Report
American Society of Anesthesiologists

Bibliography by Section

I. Education and training

MRI education for long term health hazards.

Observational studies, case reports, or comparisons without pertinent control groups

II. Patient screening

Neonates or premature infants.

Nonrandomized comparative studies

Observational studies, case reports, or non-pertinent comparison groups

Intensive or critical care patients.

Observational studies, case reports, or non-pertinent comparison groups

Patients with impaired respiratory function (e.g., tonsillar hypertrophy, sleep apnea).

Observational studies, case reports, or non-pertinent comparison groups
Patients with hemodynamic instability and vasoactive infusion requirements.

*Observational studies, case reports, or non-pertinent comparison groups*


Patients with impaired renal function (e.g., diabetes, elderly patients, hypertension, hepatic disease) who are administered gadolinium.

*Observational studies, case reports, or non-pertinent comparison groups*


**III. Equipment-related risks for adverse outcomes related to MRI**

**Foreign bodies.**

*Observational studies, case reports, or comparisons without pertinent control groups*


**Ferromagnetic items.**

*Observational studies, case reports, or non-pertinent comparison groups*


**Physiologic monitors.**

*Observational studies, case reports, or non-pertinent comparison groups*

6. Hall SC, Stevenson GW, Suresh S: Burn associated with temperature monitoring during magnetic resonance imaging. Anesthesiology 1992; 76:152

Invasive monitors (e.g., intravascular catheters).

Observational studies, case reports, or non-pertinent comparison groups

Oxygenation and ventilation equipment.

Observational studies, case reports, or non-pertinent comparison groups
7. Smith DS, Askey P, Young ML, Kressel HY: Anesthetic management of acutely ill patients during magnetic resonance imaging. Anesthesiology 1986; 65:710-711

Pacemakers and implanted cardioverter defibrillators (ICDs).

Observational studies, case reports, or non-pertinent comparison groups
6. Coman JA, Martin ET, Sandler DA, Thomas JR: Implantable cardiac defibrillator interactions with magnetic resonance imaging at 1.5 Tesla. J Am Coll Cardiol 2004; 43:138A
33. Shellock FG, O'Neil M, Ivans V, Kelly D, O'Connor M, Toay L, Crues JV: Cardiac pacemakers and implantable cardioverter defibrillators are unaffected by operation of an extremity MR imaging system. AJR Am J Roentgenol 1999; 172:165-170
35. Valhaus C, Sommer T, Lewalter T, Schimpf R, Schumacher B, Jung W, Luderitz B: Interference with cardiac pacemakers by magnetic resonance imaging: are there irreversible changes at 0.5 Tesla? Pacing Clin Electrophysiol 2001; 24:489-495
Other implanted electronic devices (e.g., deep brain stimulators, vagal nerve stimulators, phrenic nerve stimulators).

Observational studies, case reports, or non-pertinent comparison groups


IV. Preparation for MRI

Patient preparation.

Observational studies, case reports, or non-pertinent comparison groups


V. Patient Management during MRI

Monitoring during MRI.

MRI-safe/conditional monitors:

Observational studies, case reports, or non-pertinent comparison groups


Remote MRI monitoring:

Observational studies, case reports, or non-pertinent comparison groups

Monitoring to comply with ASA standards:

Observational studies, case reports, or non-pertinent comparison groups


VI. Anesthetic care during MRI

Moderate Sedation.

Observational studies, case reports, or non-pertinent comparison groups


29. Shepherd JK, Hall-Craggs MA, Finn JP, Bingham RM: Sedation in children scanned with high-field magnetic resonance; the experience at the Hospital for Sick Children, Great Ormond Street. Br J Radiol 1990; 63: 794-797


**Light anesthesia/Deep Sedation.**

**Randomized controlled trials**


**Observational studies, case reports, or non-pertinent comparison groups**


Anesthesia equipment, availability and location (e.g., integrated anesthesia machine, medical gases, gas scavenging, suction, adequate electrical outlets and lighting, storage areas for equipment and drugs).

Observational studies, case reports, or non-pertinent comparison groups


VII. Environmental emergencies

Fire.

Observational studies, case reports, or non-pertinent comparison groups

Projectiles.

*Observational studies, case reports, or non-pertinent comparison groups*
