

The Guideline for MRI with Sedation

Indications for MRI (General Guidance)

1. Clinical signs and symptoms concerning for possible musculoskeletal infection
2. Fever
3. Elevated inflammatory markers (C-reactive protein [CRP] or erythrocyte sedimentation rate [ESR])
4. Leukocytosis with a left shift
5. Localized pain and limited use of the affected extremity, spine, or pelvis
6. Focal physical findings of tenderness, swelling, joint irritability, warmth, or erythema

Care Pathway for MRI

1. Experienced physician personally conducts the history and physical examination prior to ordering the study
2. Direct verbal communication of the clinical impression with the radiologist prior to imaging
3. Communication with the operating room board runner and anesthesia team handling the MRI sedation prior to imaging
4. Review of images as soon as possible to determine indications and approach to surgical procedure

Daily Time Management for Orthopaedic Surgeon

0700 Review first responder's evaluation, laboratory results, and radiographic images

0800 Meet family and personally examine child

0830 Attend care progression huddle with multidisciplinary team to make decision about MRI or surgical procedure, have team post case for MRI and notify operating room board runner of anticipated time of imaging, and discuss with radiologist (by telephone or in person)

0900 Clinic

1230 View MRI scans in progress

1245 Decide for surgical procedure, notify operating room, discuss with family for consent, and transport patient to operating room under continued anesthesia

1300 Operating room for irrigation and debridement

Indications for Surgical Procedure (Relative)

1. Drainable abscess (intraosseous, subperiosteal, or extraperiosteal); size threshold is influenced by the overall clinical impression of illness
2. Joint effusions suspicious for septic arthritis
3. Evolving sepsis (markedly elevated inflammatory markers, fever, positive blood culture, hypotension, tachycardia) along with the specific MRI findings may tilt the scale toward the surgical procedure rather than observation

Indications for Repeat Imaging

1. In general, repeat imaging is discouraged unless it is believed that it would be useful to guide clinical decision-making for or against further surgical intervention
2. Suspected additional focus of infection, not previously imaged
3. Concern about reaccumulation of surgically drainable abscess or sequestrum in previous surgical field as a possible cause for lack of clinical or laboratory improvement

Recommendations for Operational Workflow of Sedated MRI Process and Operating Room Coordination

1. Create a one-hour safety capacity slot in the sedated MRI schedule approximately in the middle of the day.
2. Create a notification system whereby the MRI scheduler is contacted by a certain morning hour to know that that the safety capacity slot will be utilized or will be made available for other studies.
3. Create a notification system whereby the operating room board runner is notified about cases anticipated for possible surgical procedures, pending MRI findings.

MRI Safety Capacity

This is often done in operational workflow models when the item of demand is variable and unpredictable in presentation to the queue. The key to the safety capacity slot is to place it late enough in the day that it can be filled with other patients if it is not utilized for infection work-ups. This avoids an impact on MRI scanner workflow. If the radiology scheduler is not contacted by 9:00 A.M., the radiology team may fill the slot with other cases.

Operating Room Coordination

The operating room time is coordinated (by the board runner) rather than being protected. This avoids having a team or room on standby. The benefit of having the MRI scans around 12:00 P.M. to 2:00 P.M. is that they occur during the time of day that is often nearing a slowdown (as most of the cases of the morning “rush hour” have been completed) and yet an abundance of anesthesia and operating room staff are still on the clock for their shift. This leaves a wealth of operating room capacity to absorb these add-on cases, as long as the operating room board runner is aware of the cases early in the day. They are notified when the MRI is ordered and posted to the scanner. They are called as soon as preliminary images are leading to plan for, or against, a surgical procedure. Sometimes the decision is delayed until the initial post-contrast images are reviewed. From that point until the end of the scan and transport to the operating room, there is usually about thirty minutes to assemble a team (from available staff), open a room, and prepare the instruments. As long as the surgeon is flexible as to room and team, the system works well. Because the cases are not extremely complex, any general team can help. At the end of the day, most of the procedures are some form of irrigation and drainage without instrumentation. They do not require an advanced skill set of the operating room team. ■