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Patient Safety Tip of the Week

May 5, 2026

Sedation in the MRI Suite

In last week's column (April 28, 2026 Patient Safety Tip of the Week "Patient Safety Events in Radiology") we talked about the many things that can go wrong in the Radiology Suite. Well, the MRI suite is even more complicated and things can go wrong there, too.

A great example comes from the Finnish Safety Investigation Authority investigation on a death that occurred during an MRI procedure in January 2025 (SIAF 2026). A middle-aged patient was undergoing an MRI for evaluation of shoulder pain at a private medical facility. An MRI had previously been attempted on the patient without sedation, but this was unsuccessful. The anesthesiologist suggested performing an MRI under sedation on the same day because the patient suffered from claustrophobia. The patient could have waited for an MRI scan performed under general anesthesia at the University Hospital, for which an orthopedist had previously provided a referral.

The patient was administered several doses of anesthetic during the procedure. A total dose was 600 mg of propofol was given during approximately 20 minutes of anesthesia. The patient also received 2-3 mg of midazolam intravenously at the start and additional later doses of 1 mg. The total dose was 5 mg of midazolam. At the end of the procedure, the patient received 0.5 mg of flumazenil intravenously to reverse the effect of the midazolam.

The patient's condition deteriorated during the scan and the patient became lifeless. The patient was resuscitated but later died in a hospital 5 days later.

When the patient was pulled from the MRI when the scan ended, staff noted the patient's limbs had become pale and the patient did not react to movement or speech. The anesthesiologist tried to wake the patient up and no pulse could be felt. A radiographer went to the recovery room to get a bag valve mask. The patient was moved onto the floor and pulled into the control room. A radiographer left to get a defibrillator from the entrance lobby. Advanced cardiac life support continued with CPR and ventilation of the

patient with a bag valve mask. A radiographer went to the recovery room to get a resuscitation cart and more supplies. A call button in the imaging room was used to request additional staff to help with the situation. Several people arrived on the scene to provide help.

The semi-automatic defibrillator reported that there was no shockable rhythm. The patient was given two doses of intravenous resuscitation medication, and a pulse was detected after this. The patient was connected to a monitor that showed a normal cardiac rhythm. An attempt was made to insert a breathing tube for the patient using a video laryngoscope. The resuscitation cart did not contain the correct size of videolaryngoscope blade, and the first attempt to insert the breathing tube was unsuccessful. The anesthesiologist then inserted a breathing tube with an ordinary laryngoscope and continued to assist breathing with the bag valve mask. The patient's oxygenation was initially poor, and their blood pressure was slightly low, but the situation improved to a satisfactory level during monitoring. The patient began to breathe on their own. The patient was transferred to a hospital but died 5 days later despite intensive care.

The SIAF investigation found that the amount of anesthetic medication administered to the patient resulted in a situation equivalent to general anesthesia rather than sedation. The oxygen flow administered through an oxygen mask was also too low. An MRI-compatible monitor required to monitor the patient's basic vital signs was not available and the patient's deteriorating condition was not noticed in time. Apparently, the only monitoring during the procedure was visually checking for misting of the patient's oxygen mask and chest respiration movements (done by the anesthesiologist in the adjacent room).

In addition, the imaging unit was not prepared to handle an emergency situation. The resuscitation and patient transfer equipment had to be retrieved from other spaces in the medical center, which delayed the start of life support. No regular training for resuscitation and emergency situations had been organized for imaging unit staff. Oversight and risk management at the center were also cited as being inadequate, and the agreement between the center and the company providing anesthesia services was also general in terms of specifying responsibilities and roles.

SIAF also noted there are no uniform national guidelines or unambiguous minimum requirements for the implementation of NORA (non-operating room anesthesia) activities, even though they have become more common in different environments. This leads to varying practices and client and patient safety risks.

The SIAF investigation is quite well done. We encourage you to read the .PDF of the investigation report. We think there are valuable lessons learned here and that all out-of-hospital MRI facilities should be asking whether similar incidents could happen at their facilities.

Lastly, there does appear to be at least in Finland some regulatory oversight of MRI units. You'll recall from the recent Invisible Force Podcast segments and several of our prior columns on MRI safety that such oversight is glaringly missing in the US.

Some of our prior columns on patient safety issues in the radiology suite:

- October 16, 2007 "Radiology as a Site at High-Risk for Medication Errors"
- February 19, 2008 "MRI Safety"
- September 16, 2008 "More on Radiology as a High Risk Area"
- October 7, 2008 "Lessons from Falls....from Rehab Medicine"
- October 2008 "Preventing Infection in MRI"
- March 17, 2009 "More on MRI Safety"
- March 2009 "Risk of Burns during MRI Scans from Transdermal Drug Patches"
- August 11, 2009 "The Radiology Suite…Again!"
- January 2010 "Falls in the Radiology Suite"
- August 2010 "Sedation Costs for Pediatric MRI"
- January 25, 2011 "Procedural Sedation in Children"
- February 1, 2011 "MRI Safety Audit"
- October 25, 2011 "Renewed Focus on MRI Safety"
- March 13, 2012 "Medical Emergency Team Calls to Radiology"
- August 2012 "Newest MRI Hazard: Ingested Magnets"
- October 22, 2013 "How Safe Is Your Radiology Suite?"
- February 25, 2014 "Joint Commission Revised Diagnostic Imaging Requirements"
- July 2014 "New MRI Risks: for Staff!"
- July 1, 2014 "Interruptions and Radiologists"
- November 2014 "More Radiologist Interruptions"
- October 21, 2014 "The Fire Department and Your Hospital"
- June 23, 2015 "Again! Mistaking Antiseptic Solution for Radiographic Contrast"
- August 25, 2015 "Checklist for Intrahospital Transport"
- March 22, 2016 "Radiology Communication Errors May Surprise You"
- August 2016 "Guideline Update for Pediatric Sedation"
- October 2016 "MRI Safety: There's an App for That!"
- January 17, ,2017 "Pediatric MRI Safety"
- August 8, 2017 "Sedation for Pediatric MRI Rising"
- November 14, 2017 "Tracking C. diff to a CT Scanner"
- March 2018 "MRI Death a Reminder of Dangers"
- March 2018 "Cardiac Devices Safe During MRI But Spinners!?"
- April 2018 "Radiologists Get Fatigued, Too"
- May 2018 "Cost of Interrupting a Radiologist"
- November 2018 "OMG! Not My iPhone!"
- December 11, 2018 "Another NMBA Accident"

- April 2, 2019 "Unexpected Events During MRI"
- September 2019 "New MRI Hazard: Magnetic Eyelashes"
- October 15, 2019 "Lots More on MRI Safety"
- November 5, 2019 "A Near-Fatal MRI Incident"
- November 12, 2019 "Patient Photographs Again Help Radiologists"
- November 26, 2019 "Pennsylvania Law on Notifying Patients of Test Results"
- January 7, 2020 "Even More Concerns About MRI Safety"
- July 14, 2020 "A Thesis on Intrahospital Transports"
- August 25, 2020 "The Off-Hours Effect in Radiology"
- October 2020 "New Warnings on Implants and MRI"
- January 2021 "New MRI Risk: Face Masks"
- May 25, 2021 "Yes, Radiologists Have Handoffs, Too"
- June 1, 2021 "Stronger Magnets, More MRI Safety Concerns"
- November 2021 "Yet Another Risk During MRI"
- January 2022 "MRI Safety Issues"
- February 2022 "Managing Incidental Findings"
- June 2022 "Where Are You Barcoding?"
- July 12, 2022 "Radiologists Racked by Interruptions"
- July 26, 2022 "More Risks in the Radiology Suite"
- May 2023 "Factors Associated with Radiology Diagnostic Errors"
- September 12, 2023 "Radiology and Hospital-Acquired Infections"
- October 24, 2012 "Serious MRI Accident at Unregulated MRI Center"
- November 21, 2023 "Another Terrifying MRI Accident"
- January 2024 "Guns and MRI Don't Mix"
- June 11, 2024 "Nursing in the MRI Suite"
- August 13, 2024 "Preventing Thermal Injury During MRI"
- October 2024 "Another MRI Accident Reveals Gap in Oversight
- October 2024 "MRI Special Patient Considerations"
- October 8, 2024 "First Responders and MRI"
- April 22, 2025 "Updated ACR Manual on MRI Safety"
- July 8, 2025 "Applying Human Factors Concepts to Radiology"
- July 22, 2025 "What the Heck are LLM's?"
- November 2025 "MRI Hazards - Big and Small"
- January 6, 2026 "Here's Why Firefighters Need MRI Training"
- March 10, 2026 "The Invisible Force Podcast"
- April 28, 2026 "Patient Safety Events in Radiology"

Some of our prior columns on patient safety issues related to MRI:

- February 19, 2008 "MRI Safety"
- March 17, 2009 "More on MRI Safety"
- October 2008 "Preventing Infection in MRI"
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- October 15, 2019 "Lots More on MRI Safety"
- November 5, 2019 "A Near-Fatal MRI Incident"
- November 2019 "ECRI Institute's Top 10 Health Technology Hazards for 2020"
- January 7, 2020 "Even More Concerns About MRI Safety"
- March 2020 "Airway Emergencies in the MRI Suite"
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- February 20, 2024 "What is a "Safety Case"?"
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- May 2025 "Add Another Item to Your MRI Screening Protocols"
- November 2025 "MRI Hazards - Big and Small"
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References:

SIAF (Safety Investigation Authority, Finland). A patient's death as a result of anaesthesia administered during an MRI procedure highlights the difficulty of monitoring, self-supervision and implementing non-operating room anaesthesia (NORA). Safety Investigation Authority, Finland 2026; https://www.turvallisuustutkinta.fi/en/index/currentissues/releases/2026/apatient8217sdeathasaresultofanaesthesiaadministeredduringanmriprocedurehighlightsthedifficultyofmonitoringself-supervisionandimplementingnon-operatingroomanaesthesianora160.html

SIAF (Safety Investigation Authority, Finland). Patient's death as a result of anaesthesia administered during magnetic resonance imaging in January 2025. Safety Investigation Authority, Finland 2026; https://www.turvallisuustutkinta.fi/material/sites/otkes/viestinta/h4wzx8cyq/T2025-01_Safety_Investigation_Report.pdf

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