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What Pediatric Sedation in MRI Costs Patients and Providers

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With its excellent soft tissue contrast for distinguishing between normal and abnormal tissue, MRI remains one of the most powerful imaging tools. In clinical practice, it can offer information that may not be able to be obtained any other way. And yet as powerful a tool as MRI is, it can be challenging to perform an MRI exam on some adults—and particularly on children*—without sedation. And yet sedation poses its own risks and complications. It can impact everything from the health of the child to organizational efficiency and cost.

The Impact on Quality of Care Inside and Outside the Facility

Perhaps, the greatest risk to children is the risk of foregoing an important exam because of fear of sedation. "As a parent myself and in speaking to other parents, I know this is a real fear," says Robert J. Min, MD, chairman of Radiology, Weill Cornell Medical College, radiologist in chief, NewYork-Presbyterian Hospital, and president of Weill Cornell Imaging at NewYork-Presbyterian. "Some parents might withhold what might be a very valuable imaging exam, one that provides more and better clinical information, out of fear."

For those children who do undergo sedation, recovery can be lengthy and sometimes unmonitored. According to a study about the side effects of sedation in diagnostic studies, "limitations in healthcare resources and personnel have made it difficult to monitor [children who require sedation for MRI and CT] for prolonged periods. Despite nationally recommended discharge criteria, in busy outpatient settings, children may be sent home in the care of their parents after a brief recovery from sedation, placing them at risk for adverse events in an unmonitored setting." The data from this study demonstrated that these children may experience a prolonged recovery as well as "a significant incidence of delayed side effects after sedation for a diagnostic procedure." Specifically, the study found a high incidence of motor imbalance, agitation, gastrointestinal effects, and restlessness after discharge.[1]

*MR scanning has not been established as safe for imaging fetuses and infants less than two years of age. The responsible physician must evaluate the benefits of the MR examination compared to those of other imaging procedures.

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In addition, with any medication given to a patient, there is always the risk of an allergic or adverse reaction. In very rare cases, Dr. Min notes, this can even result in death. Even without an allergic reaction to sedation, any child or adult who receives sedation requires a longer recovery period after the exam. "Patients may feel nauseated or groggy and they cannot rapidly return to normal activities," says Dr. Min. "Among pediatric patients, these effects—and the risks associated with them—can be further amplified."

Longer visits—and higher resource costs—are associated with sedation.[2]

The Impact on Room/Resource Utilization and Scheduling

Sedation takes time—both for patients and staff. It requires departmental resources from the onset of obtaining parental consent for pediatric sedation to scheduling the exam, performing sedation, completing the MRI exam, and monitoring recovery. There are many steps and each one requires the time and attention of staff. As a result, longer visits—and higher resource costs—are associated with sedation.[2]

"I believe a reduction in MRI sedation will eventually improve workflow efficiency and decrease costs," says Dr. Min. Research suggests this could be true. In a study of pediatric sedation published in Pediatric Radiology, researchers noted: "There was a 17% decrease in MRI room time for those patients whose examinations could be performed without sedation."[3] In addition to the impact on room utilization, there may be inefficiencies with scheduling due to parental anxiety or fear. After agreeing to the exam at the time of scheduling, some parents may have a change of heart, resulting in an empty slot on the MRI schedule.[4]

The Impact on Patient Experience and Satisfaction

Many organizations have used different techniques to ease parental and patient anxiety—from painting exams rooms to using decals to make exam rooms more child-friendly. Yet, there has been little created to educate children and their families about the experience of having an MRI. "As an industry, we could learn from pediatric dentists, who have made significant inroads to distracting their young patients and reducing their anxiety," says Dr. Min. "For example, many dental practices allow children to pick a small toy after the exam, which leaves the child with a good memory for the next visit."

Helping to improve the pediatric patient experience can improve not just the ability to care for these patients but also their families' satisfaction with the organization as a whole. This could be particularly important in MRI: In a 2010 study of the parents and/or legal guardians of 220 children scheduled for sedation in a university hospital setting, "parents of children who underwent magnetic resonance imaging reported the lowest mean satisfaction scores."[5]

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Better Education Could Help

Providing children and their families with educational tools that help explain what an MRI looks like, what it sounds like, and what it does before the exam may help reduce anxiety. "If we can reduce patient and parental anxieties, I think we can limit the need for sedation for many children," says Dr. Min. "When a fun, educational program becomes part of routine imaging practice, positive results will follow—and not just in children. Adults could benefit from more and better education about what to expect from an MRI exam too. We can—and should—work to reduce pediatric sedation in MRI. In many cases, it's the right thing to do for our patients, for their families, and for our practices."

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What it takes for your department to sedate a child[6]

- Careful pre-sedation evaluation for underlying medical or surgical conditions that places the child at risk.
- Communicate and ensure appropriate fasting.
- A focused airway examination for large tonsils or anatomic airway abnormalities that might increase the potential for airway obstruction.
- Appreciation of possible drug interactions.
- Appropriate training and skills in airway management to allow rescue of patient.
- Age- and size-appropriate equipment for airway management and venous access.
- Appropriate medications and reversal agents.
- Sufficient staff to perform procedure and monitor the patient.
- Appropriate physiologic monitoring during and after procedure.
- A properly equipped and staffed recovery area.
- Recovery to pre-sedation level of consciousness before discharge.
- Appropriate discharge instructions.

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