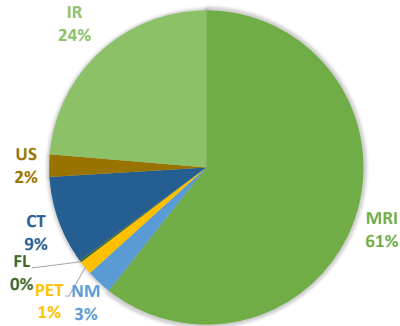


Sedation in Pediatric Radiology

Necessary Evil or Avoidable Peril?



Indications for sedation use in pediatric radiology

- Motion reduction is necessary for diagnostic quality
- Most commonly necessary for MRI examinations
 - Neuroimaging most frequently, most common prolonged sedation in young children
 - Peak sedation utilization is 3-5 years of age
- Needed for reduction in anxiety or avoidance of pain (interventional procedures) for patient comfort
- Necessary for patient safety due to agitation

No standardized guidelines for best sedation regimen for pediatric imaging

Sedation-associated risks

Procedural risks

- Serious adverse events are rare (0.4%, mortality is 1 in 60,000 cases), greater with multiple drug sedation regimen
- Sedation failure (2-9%)
- Hypoxemia (0.1-6%)
- Unexpected intubation (~2%)

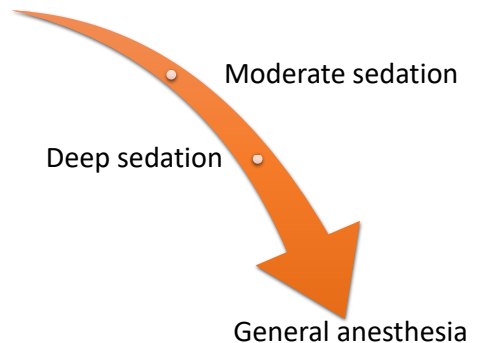
Short-term risks

- Prolonged recovery with delayed return to baseline within 8 hours (52%)
- Side effects: motor imbalance, gastrointestinal effects, agitation, and restlessness
- Follow-up medical attention for side effects (4%)

Long-term effects

- Neurodevelopmental impacts of anesthesia exposure are contentious
- Animal and population studies suggest developmental effects, but controlled trials have failed to show effect
- FDA warning issued: Pregnant women in third trimester and children under three years “should not have repeated or lengthy (greater than 3 hours) use of general anesthetic and sedation drugs because of concerns for adverse effects on the developing brains of young children”

Minimal sedation



How to reduce sedation use in pediatric imaging - STOPS

Select the best examination for each patient

- Pediatric-dose CT or ultrasound may be viable alternatives for some indications

Try first without sedation

- Screen patients to determine sedation needs, may use mock scanner to test

Offer education for patients and families

- Cartoon: <https://www.chop.edu/video/getting-mri-cartoon-kids>
- Coloring books: <http://www.chp.edu/our-services/radiology/coloring-book>

Provide distraction during the examination

- Child life, family support, audiovisual systems

Shorten and simplify studies

- Take advantage of newer, faster acquisitions
- Radiologist support is critical to *discern between diagnostic and aesthetic imaging* – tolerance of motion degradation and need for occasional repeat imaging

