

# Diagnostic Imaging Pathways - Paediatric, Magnetic Resonance Imaging

## Population Covered By The Guidance

This pathway provides guidance on general Magnetic Resonance Imaging in children.

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## Quick User Guide

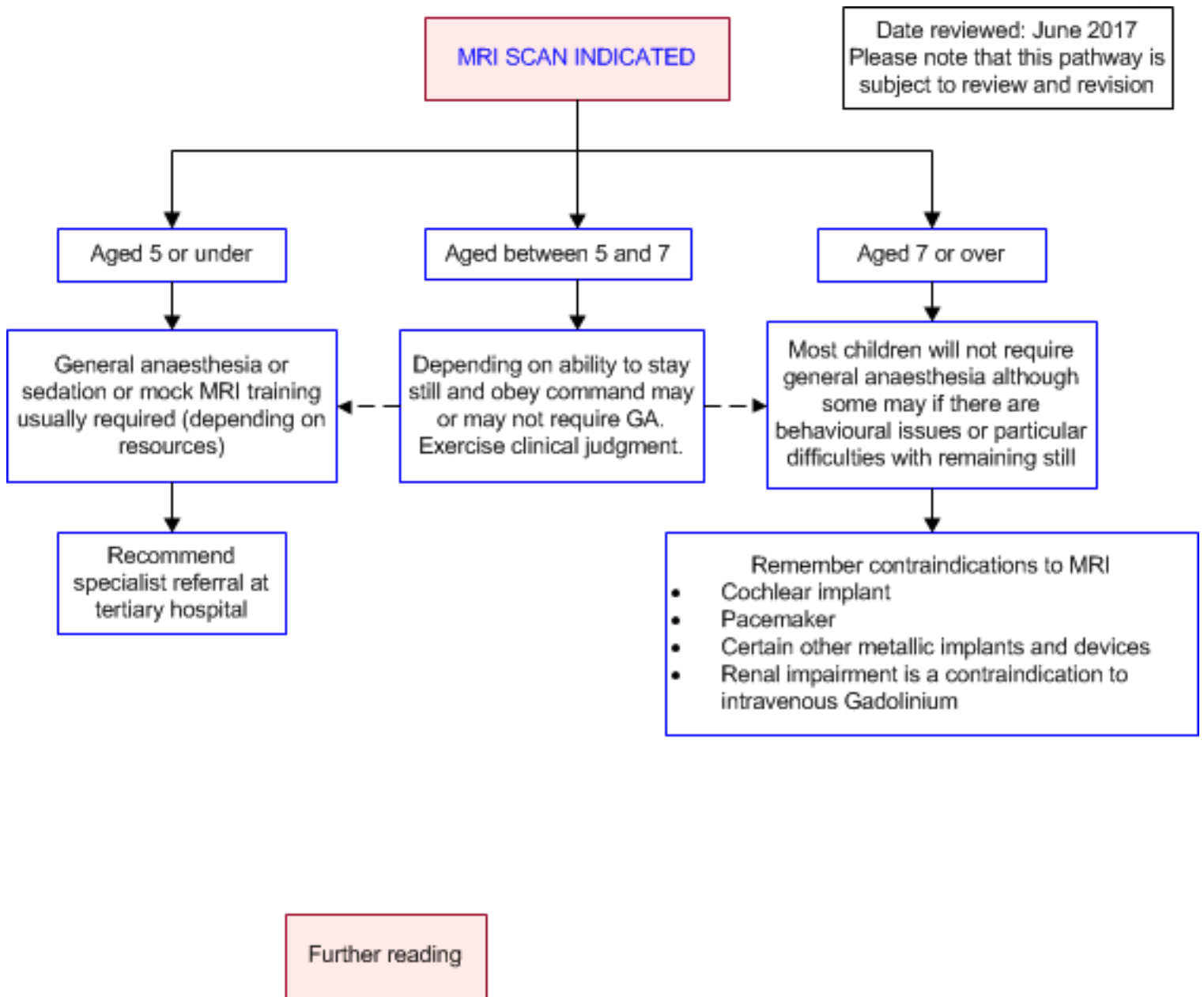
Move the mouse cursor over the **PINK** text boxes inside the flow chart to bring up a pop up box with salient points.

Clicking on the **PINK** text box will bring up the full text.

The relative radiation level (RRL) of each imaging investigation is displayed in the pop up box.

SYMBOL	RRL	EFFECTIVE DOSE RANGE
	None	0
	Minimal	< 1 millisieverts
	Low	1-5 mSv
	Medium	5-10 mSv
	High	>10 mSv

## Pathway Diagram



## Image Gallery

*Note: Images coming soon*

## Magnetic Resonance Imaging (MRI)

- MRI scans are time consuming and often take 30mins and require the patient to remain still for up to 5 mins at a time during the scan
- Sedation or anaesthesia is required in many infants and younger children less than 6 years old
- Feed and wrap techniques can be used to alleviate the need for sedation or anaesthesia in children up to 3 months of age

- MRI is contraindicated in children with some implanted devices including certain cochlear implants, brain or spinal stimulators or pacemakers

## Magnetic Resonance Imaging (MRI)

- MRI scans are time consuming, generally taking 15-30 minutes but sometimes up to one hour, and require the patient to keep still for a successful scan. Given the confined space, the need to stay still, the noise and sometimes the need for intravenous access, it is not surprising that some children feel significant levels of anxiety [1-3](#)
- General anaesthesia or sedation is often required for children under 6 years of age. However, this age is arbitrary and individual assessment is required. If an older child has learning or behavioural difficulties they may still require general anaesthesia or sedation [4-5](#)
- General anaesthesia or sedation require more advanced equipment, additional appointment time and highly trained staff [1, 4](#)
- The use of play therapy and mock MRI scanners can reduce the need for sedation and general anaesthesia, particularly in the 3-8 age group [1, 6](#)
- Other techniques, such as feed and wrap (where sleep is induced through warmth and feeding), can be successfully used in babies under 12 weeks of age [1, 7](#)
- There are risks from the effect of the powerful magnets within the MR suite and MRI is contraindicated in patients with some implanted devices including certain cochlear implants, brain or spinal stimulators or pacemakers [8, 9](#)
- Whilst anaphylactic reactions to gadolinium based contrast agents for MRI are rare, there is an association with the development of nephrogenic systemic fibrosis (NSF) in patients with chronic renal impairment. Recent studies have also shown gadolinium accumulation in brain and body tissues after repeated doses of some forms of gadolinium based contrast agents [8, 10](#)

## References

Date of literature search: May 2017

References are graded from Level I to V according to the Oxford Centre for Evidence-Based Medicine, Levels of Evidence. [Download the document](#)

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3. Chou IJ, Tench CR, Gowland P, Jaspan T, Dineen RA, Evangelou N, et al. **Subjective discomfort in children receiving 3 T MRI and experienced adults' perspective on children's tolerability of 7 T: a cross-sectional questionnaire survey.** BMJ Open. 2014;4(10):e006094. (Level III evidence). [View the reference](#)
4. Edwards AD, Arthurs OJ. **Paediatric MRI under sedation: is it necessary? What is the evidence for the alternatives?** Pediatr Radiol. 2011;41(11):1353-64. (Review article). [View the reference](#)
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- children.** *Pediatr Radiol.* 2010;40(8):1368-74. (Level IV evidence). [View the reference](#)
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8. Crownover BK, Bepko JL. **Appropriate and safe use of diagnostic imaging.** *Am Fam Physician.* 2013;87(7):494-501. (Review article). [View the reference](#)
9. Cogbill TH, Ziegelbein KJ. **Computed tomography, magnetic resonance, and ultrasound imaging: basic principles, glossary of terms, and patient safety.** *Surg Clin North Am.* 2011;91(1):1-14. (Review article). [View the reference](#)
10. Abujudeh HH, Kaewlai R, Kagan A, Chibnik LB, Nazarian RM, High WA, et al. **Nephrogenic systemic fibrosis after gadopentetate dimeglumine exposure: case series of 36 patients.** *Radiology.* 2009;253(1):81-9. (Level IV evidence). [View the reference](#)

## Information for Consumers

Information from this website	Information from the Royal Australian and New Zealand College of Radiologists' website
<p><a href="#">Consent to Procedure or Treatment</a></p> <p><a href="#">Radiation Risks of X-rays and Scans</a></p> <p><a href="#">Magnetic Resonance Imaging (MRI)</a></p>	<p><a href="#">Magnetic Resonance Imaging (MRI)</a></p> <p><a href="#">Radiation Risk of Medical Imaging for Adults and Children</a></p> <p><a href="#">Making Your Child's Test or Procedure Less Stressful</a></p>

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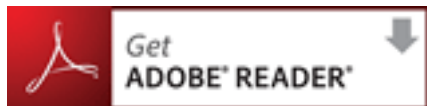
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