

Researchers identify best way to diagnose head injuries and minimise CT scans

April 13 2017



Head injuries in children are some of the most frequent presentations to emergency departments. More than 3000 children are admitted to the Royal Children's Hospital (RCH) with head injuries every year. Some children require a CT scan to rule out a serious brain injury. This process is obvious for serious head injuries, but it's more challenging to determine whether CT scans are necessary for children with milder injuries.

Murdoch Childrens Research Institute's (MCRI) Associate Professor Franz Babi led a large study of 20,000 [children](#) who present at Australian

and New Zealand emergency departments with head injuries of all severities. The aim of the study was to determine which children will need CT scans to detect brain [injury](#). This can be a vexed issue because physicians need to balance the importance of diagnosing an injury with reducing radiation exposure as much as possible.

A/Prof Babl said the preferred course of treatment is to avoid a CT scan in minor head injuries if it is unnecessary. "In particular, there is concern about the high radiation dose associated with CT scans of the head which can lead to cancer," he said.

The causes of head injuries vary by age. In younger children it can be the result of an infant falling off a change table or the inevitable falls when toddlers start to walk and explore and in older children it's often a result of playing sport.

Three clinical decision rules (CDRs) have been developed to identify children at higher risk of intracranial injuries. These rules assist clinicians to minimise the use of CT scans while still identifying all relevant injuries:

- The Pediatric Emergency Care Applied Research Network (PECARN, USA)
- The Canadian Assessment of Tomography for Childhood Head Injury (CATCH) rule
- The Children's Head Injury Algorithm for the Prediction of Important Clinical Events (CHALICE, UK)

MCRI led a team of emergency physicians from 10 children's emergency departments around Australia and New Zealand to determine which of these three decision rules is the best option when it comes to identifying children who are at very low risk of a traumatic [brain injury](#).

The study, published in *The Lancet* determined that all three rules were good options, but one achieved a 100 per cent success rate.

"We found that the three rules tested were all good, but one rule, the PECARN rule from the US, did not miss a single patient requiring neurosurgery," A/Prof Babl said.

Based on the research findings, the next step is for the group of emergency physicians to develop a national approach to optimise the management of children with [head injuries](#).

Provided by Murdoch Childrens Research Institute

Citation: Researchers identify best way to diagnose head injuries and minimise CT scans (2017, April 13) retrieved 5 May 2024 from <https://medicalxpress.com/news/2017-04-injuries-minimise-ct-scans.html>

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