



Title	Computed Tomography for Pediatric Patients: Review of Clinical Effectiveness and Indications for Use
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Aim

To assess the capability of computed tomography (CT) scanners with various numbers of slices to obtain acceptable images while minimizing radiation doses in diagnosing common pediatric indications, eg, head CT for trauma, chest CT, cardiac CT, and abdominal CT.

Results and conclusions

Most studies identified were either performed on adult populations, or the number of slices for the scanners was not specified, resulting in limited published evidence for answering the research question. Based on the limited data available, the image quality of 64-MSCT (multislice computed tomography) and 16-MSCT was found to be comparable, and the 64-slice scanner reduced radiation exposure by 26.3% compared to the 16-slice scanner. A lower tube voltage (80 kVp) reduced radiation dosage to patients without sacrificing image quality. The use of MSCT combined with automatic exposure control effectively reduced radiation exposure. A comparison between a 16-slice MSCT scanner and MRI showed that CT was not as sensitive as diffusion-weighted MRI (DW MRI) in detecting brain injuries in children.

Recommendations

Not applicable.

Methods

Literature published in English between 2004 and April 2009 comparing CT scanners with different numbers of slices, and MSCT with ultrasound or MRI were selected from common bibliographic databases and websites of relevant agencies and associations. Two independent reviewers selected articles for inclusion based on specific criteria, and disagreements were resolved by consensus. Searches were limited to health technology assessments, systematic reviews, meta-analyses, randomized controlled trials, controlled clinical trials, and guidelines. This report presents and discusses the results.

Further research/reviews required

Well-designed clinical studies need to provide more rigorous evidence on the clinical effectiveness of using MSCT in the pediatric population. Also, clinical practice guidelines need to be developed on the use of MSCT in children.