Validation of the Ottawa Knee Rules in adults: a single centre study

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Acute knee pain is a common complaint in emergency departments, for which plain radiography has long been implemented to diagnose.[1] However, despite the popularity of radiographs, studies show knee fractures occur in only 5.2% and 6% of patients.[2,3] To combat this overuse, Stiell and colleagues in Ottawa, Canada, derived specific decision rules to justify knee radiography, later entitled the 'Ottawa Knee Rules' (OKR).[2] The rules state that knee radiographs are indicated if at least one of five criteria is met, including age 55 years or more, isolated patella tenderness, tenderness at head of fibula, inability to flex knee to 90 degrees and inability to weight-bear more than four steps.[2] Patients meeting at least one of the criteria are highly suspected of having clinically significant knee fracture, and the rules themselves have established over 99% sensitivity across various studies.[1]

This presentation will reflect a clinical audit performed in December 2019. The audit will evaluate the appropriateness of referrals for knee radiography in acute knee injury with reference to the OKR. This retrospective audit aims to analyse 300 knee X-ray referrals that presented to the medical imaging department at a major public hospital in South Australia. The authors anticipate an accuracy of up to 100% for OKR in detecting knee fractures. The overall prevalence of knee injuries, including sensitivity and specificity, and referring trends between professions will also be evaluated in this study. Results of the final analysis will be reported in the presentation.

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Seeing the end-goal in paediatric image-guided radiation therapy: imaging parameters and matching accuracy

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Objectives: Approximately 800 paediatrics will be diagnosed with cancer in Australia in 2019;[1] 5-year survival is 84%.[1] Paediatrics are 7–15 times more sensitive to radiation than adults.[2] Therefore, image-guided radiation therapy (IGRT) should be optimised. The aim of this quality improvement project was to determine if, the accuracy of IGRT for paediatric patients can be maintained using reduced radiographic dose exposures instead of vendor pre-sets.[3]

Methods: A table of low-dose radiographic exposure factors for paediatric IGRT was determined through a phantom study on a linear accelerator. This table was evaluated against the linear accelerator manufacturer pre-sets, in terms of exposure dose and user accuracy when matching. Four anatomical sites, head and neck, pelvis, abdomen and thorax were included. Matching accuracy was assessed in a simulated clinical situation, where participants anonymously recorded their matched moves in an online survey.

Results: 12 radiation therapists or radiation oncologists completed the image matching task and survey. The low-dose exposure table reduced imaging dose by 20–94% compared to manufacturer pre-sets (Table). No significant difference was observed in the accuracy of image matching (head and neck P = 0.82, thorax P = 0.15, abdomen P = 0.33, pelvis P = 0.59). Participant image exposure preference was largely equivocal.

Conclusions: Optimising radiographic exposures in paediatric IGRT is feasible, logical and therefore reasonably achievable. Implementation of the low-dose exposure table should be considered by paediatric radiotherapy departments wishing to image gently without compromising the potential to detect setup errors.

Table 1: Dose Comparison Between Factory and Low-dose Pre-set Exposure Recommendations

Exposures	Factory (mGy)	*Low-dose* (mGy)	Dose reduction (mGy)	Dose reduction (%)
Lateral pelvis	10.692	0.668	10.024	94
Anterior pelvis	0.684	0.171	0.513	75
Lateral abdomen	3.544	0.886	2.658	75
Anterior abdomen	2.506	0.251	2.255	90
Lateral thorax	4.415	1.104	3.311	75
Anterior thorax	0.342	0.274	0.068	20
Lateral head and neck	0.295	0.236	0.059	20
Posterior head and neck	0.975	0.78	0.195	20

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