

## Investigation and Management of Paediatric Acute Atraumatic Limp: A Trainee Survey

M. Shaikh Yousef <sup>1,2</sup>, E. Moylett<sup>1</sup>, F. Shannon<sup>2</sup>.

1. Department of Paediatrics, School of Medicine, University of Galway, Ireland.
2. Department of Orthopaedics, University Hospital Galway, Ireland.

### Abstract

#### *Aim*

Given the various aetiologies for acute, atraumatic, paediatric limp, we looked to assess the knowledge of trainees across specialties to highlight potential areas for improvement.

#### *Methods*

An online survey used to assess the knowledge of interns and trainees, working in the Saolta Group across Orthopaedics, Paediatrics, and Emergency Medicine, relating to acute non-trauma, paediatric limp.

#### *Results*

Of the 357 invited trainees, 101 (28.3%) completed the survey, paediatric trainees achieved the highest knowledge score, followed by orthopaedic trainees. Only thirty-eight (37.6%) respondents reported being 'comfortable' with their initial management of a child with acute atraumatic limp. Majority supported the need for additional training.

#### *Conclusion*

Given the significant knowledge gap, we propose a clinical algorithm to support trainees and standardize the care provided.

### Introduction

Acute atraumatic paediatric limp is a common presentation, with an incidence of 1.8 per 1000 children; initial presentation in a young child can present a diagnostic dilemma to the evaluating trainee<sup>1</sup>. Given the high incidence and varied levels of expertise among trainees across specialties within the Saolta hospital group, we looked to assess their knowledge through use of a knowledge questionnaire with the hope of highlighting potential areas for improvement with a focus on patient care and outcome.

## Methods

Three hundred and fifty-seven non-consultant hospital doctors (NCHDs) (153 interns, 76 adult Emergency Medicine (EM), 74 paediatric, and 54 orthopaedic trainees) working within the Saolta Hospital Group, were invited to participate via NCHD WhatsApp groups and departmental emails, in a 2-month, comparative survey, created through [www.surveymonkey.com](http://www.surveymonkey.com). The survey entailed: 19 questions: 4 demographic and training questions, 3 five-point Likert scale attitude questions, and 12 open-response knowledge questions which assessed the comprehension of specialty trainees in the diagnosis and management of acute atraumatic limp as based on a literature review and expert opinion (Edina Moylett (EM) and Fintan Shannon (FS)). Knowledge scores reported out of 20, were calculated by summing up the number of correct answers for each respondent; each correct item scored a one, and 'incorrect/don't know' responses scored zero as per the marking scheme approved by EM and FS. Statistical Package for the Social Sciences, version 28 to analyse data.

## Results

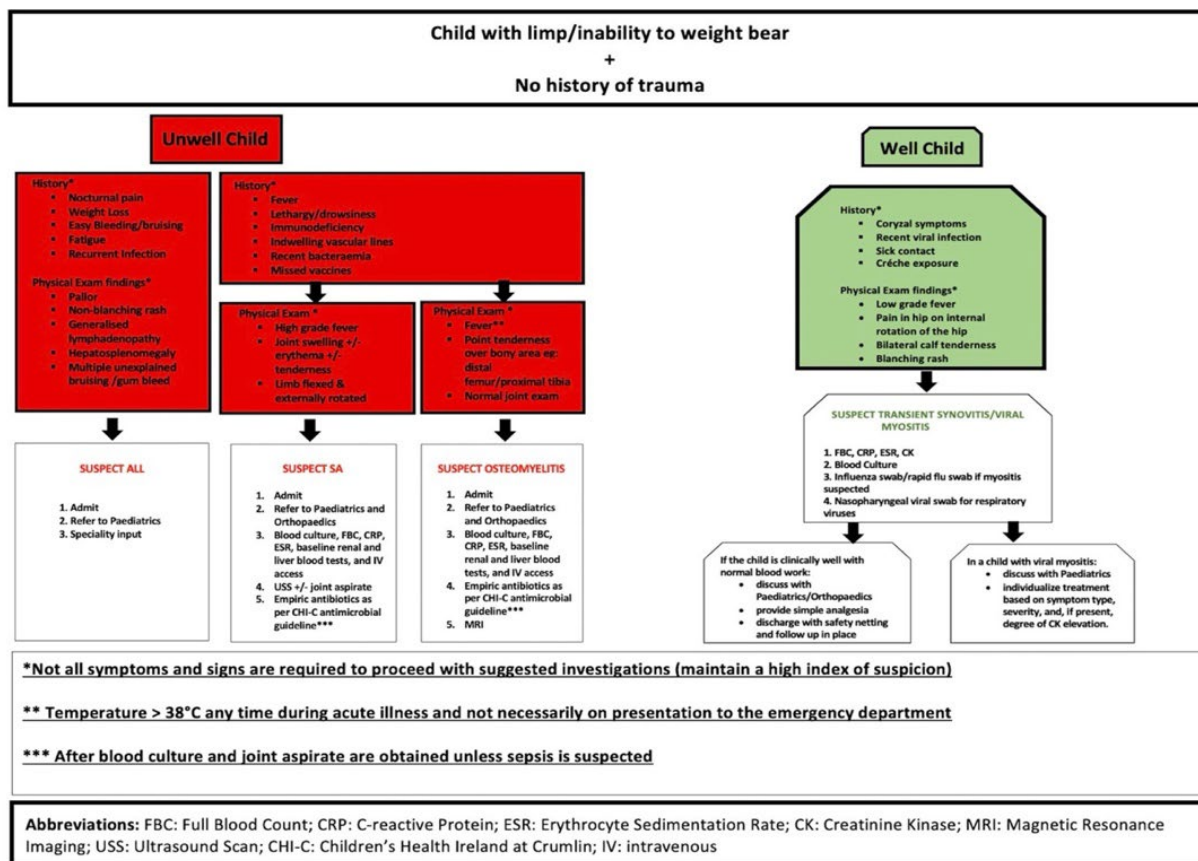
### *Demographics and duration of training*

One hundred and one NCHDs completed the survey (28.3%, n=101/357). Of the invited speciality trainees, 31.1% (n=23/74) paediatric, 35.2% (n= 19/54) orthopaedic, 18.4% (n=14/76) adult EM, and 29.4% (n=45/153) of interns responded. Of the 101 respondents, 45 (44.6%) had < 2 years clinical experience.

### *Attitude of speciality trainees and interns*

The majority of respondents (37.62%, n=38/101) reported a neutral attitude about the adequacy of their training in the initial assessment of a child with acute atraumatic limp. Only thirty-eight (37.6% n=38/101) were comfortable with the initial management of a child with acute atraumatic limp, and 79.2% (n=80/101) reported that they "strongly agree" with the need for additional training and a standardized clinical algorithm as illustrated in figure 1.

**Fig 1** Clinical algorithm to guide trainees in their approach to the initial management of a child with acute atraumatic limp presenting to the ED.



### Knowledge of speciality trainees and interns

The mean (SD) knowledge scores were the highest for paediatric trainees 15.5/20 (2.95), followed by orthopaedics 14.2/20 (2.84), EM 13.9/20 (2.30), and interns 11.8/20 (2.95),  $p < .001$ . Most had a satisfactory basic knowledge of the differential diagnosis and key laboratory investigations. However, discrepancies in knowledge were identified between the groups regarding the timing of antibiotic administration, the imaging modality of choice when suspecting septic arthritis, and the oncological differential diagnosis.

### Discussion

This comparative survey, demonstrates significant variability in trainee knowledge in diagnosing and managing acute atraumatic paediatric limp. Firstly, most orthopaedic and EM

trainees failed to identify acute lymphoblastic leukaemia (ALL) as a working diagnosis. The clinical presentation of ALL can be a source of diagnostic delay due to the challenges posed to trainees unfamiliar with its varied presentations<sup>2</sup>. The postgraduate curriculum for membership of the Royal College of Surgeons does not explicitly address non-surgical causes of paediatric limp, as compared with General Paediatric training<sup>3-5</sup>. As a result, non-paediatric trainee knowledge of paediatric medical pathology can depend on opportunistic learning. Secondly, most paediatric, EM trainees, and interns failed to identify the appropriate timing for administering empiric antibiotics. That can be attributed to the varied guidelines accessible to specialty trainees. Thirdly, the findings regarding poor identification of the gold standard imaging modality were consistent with a recent study regarding the knowledge of trainees of appropriate diagnostic imaging: self-perceived knowledge correlated weakly with knowledge scores<sup>6</sup>.

Given the significant knowledge gaps and differences in practice amongst trainees in Saolta, we propose the clinical algorithm outlined in Figure 1 to support trainees in their decision-making and standardize care provided to paediatric patients<sup>7</sup>. The algorithm highlights the importance of differentiating between the "well" and "unwell" child with acute onset atraumatic limp and provides evidence-based recommendations as per the trainee's targeted assessment. The algorithm will be available in EDs and disseminated across the Saolta group. It is hoped that use of this algorithm will improve patient care and would be considered in other hospital settings outside our group.

**Declaration of Conflicts of Interest:**

None declared.

**Corresponding author:**

Marah Shaikh Yousef,  
Department of Paediatrics,  
School of Medicine,  
University of Galway,  
University Rd.,  
Co. Galway,  
Ireland.

**E-Mail:** marah\_shaikhyousef@hotmail.com

## References:

1. McCanny PJ, McCoy S, Grant T, Walsh S, O'Sullivan R. Implementation of an evidence based guideline reduces blood tests and length of stay for the limping child in a paediatric emergency department. *Emergency Medicine Journal*. 2013 Jan 1;30(1):19-23.
2. Lefevre Y, Ceroni D, Laedermann A, De Rosa V, De Coulon G, Ayse HO, Kaelin A. Pediatric leukemia revealed by a limping episode: A report of four cases. *Orthopaedics & Traumatology: Surgery & Research*. 2009 Feb 1;95(1):77-81.
3. Brennan PA, Smith L. Intercollegiate Committee for Basic Surgical Examinations. 2015/16 Annual Report; 2016.
4. Guide to the intercollegiate MRCS examination. Intercollegiate Committee for Basic Surgical Examinations; 2018 Jul.
5. MRCPI in Paediatrics Examination Content Outline [Internet]. [cited 2022 Nov 19]. Available from:<https://rcpi-live-cdn.s3.amazonaws.com/wp-content/uploads/2019/06/MRCPI-Paediatric-Blueprint-Communication.pdf>
6. Hollingsworth TD, Duszak Jr R, Vijayasarithi A, Gelbard RB, Mullins ME. Trainee knowledge of imaging appropriateness and safety: results of a series of surveys from a large academic medical center. *Current Problems in Diagnostic Radiology*. 2019 Jan 1;48(1):17-21.
7. Dy S, Gurses AP. Care pathways and patient safety: key concepts, patient outcomes and related interventions. *International Journal of Care Pathways*. 2010 Sep;14(3):124-8.