



**Resolution**

# London Regional Safety and Learning Quarterly Networking meeting

Ingrid Henderson  
**Associate Safety and Learning Lead London**

Justine Sharpe  
**Safety and Learning Lead London**

18 March 2026  
12:30 – 14:00

  @NHSResolution

# Housekeeping

- This event is being recorded.
- Please use the chat box to submit any questions.
- Feel free to share your innovations in the chat.
- An online feedback link will be shared in the chat at the end and emailed after the webinar.



# Agenda



## Resolution

| Time  | Item                                                                                          | Speaker                                                                                                                                                                                                                            |
|-------|-----------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 12:30 | Introduction to the forum (5 mins)                                                            | <ul style="list-style-type: none"><li>Chair, Justine Sharpe, Safety &amp; Learning Lead London - NHSR</li></ul>                                                                                                                    |
| 12:35 | Learning from claims data & missed fractures (15 mins)                                        | <ul style="list-style-type: none"><li>Ingrid Henderson, Associate Safety &amp; Learning Lead – London – NHSR</li></ul>                                                                                                             |
| 12:50 | Missed fractures; guidelines and consequences (15 mins + 5mins)                               | <ul style="list-style-type: none"><li>Dr Bob Handley, National GIRFT lead, Orthopaedic Consultant, Oxford University Hospitals NHS Foundation Trust</li></ul>                                                                      |
| 13:10 | Mitigating the risk of missed fractures in the ED (15 mins + 5 mins)                          | <ul style="list-style-type: none"><li>Dr Samira Akberali, Consultant in Emergency Medicine, Clinical Lead Adult Emergency Department Royal London Hospital, London Region Chair Royal College of Emergency Medicine</li></ul>      |
| 13:30 | Preventing missed fractures and the use of AI from The Whittington Health NHS Trust (15 mins) | <ul style="list-style-type: none"><li>Dr Mayurun Ramadas, Consultant in Radiology, primarily Paediatrics with subspeciality interest in Adult and Paediatric Neurology, Paediatric MSK. The Whittington Health NHS Trust</li></ul> |
| 13:45 | Q&A                                                                                           | <ul style="list-style-type: none"><li>Facilitated by Justine Sharpe</li></ul>                                                                                                                                                      |
| 13:55 | Summary and Close (5 mins)                                                                    | <ul style="list-style-type: none"><li>Justine Sharpe</li></ul>                                                                                                                                                                     |

# Learning from claims data and missed fractures

**Ingrid Henderson**

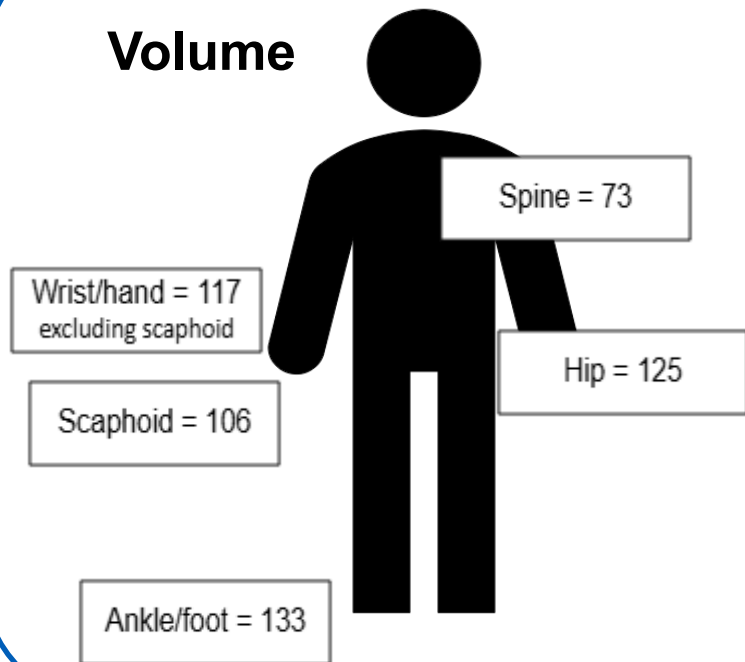
**Associate Safety and Learning Lead London – NHS  
Resolution**

# Comparison of findings NHSR publication to 2026

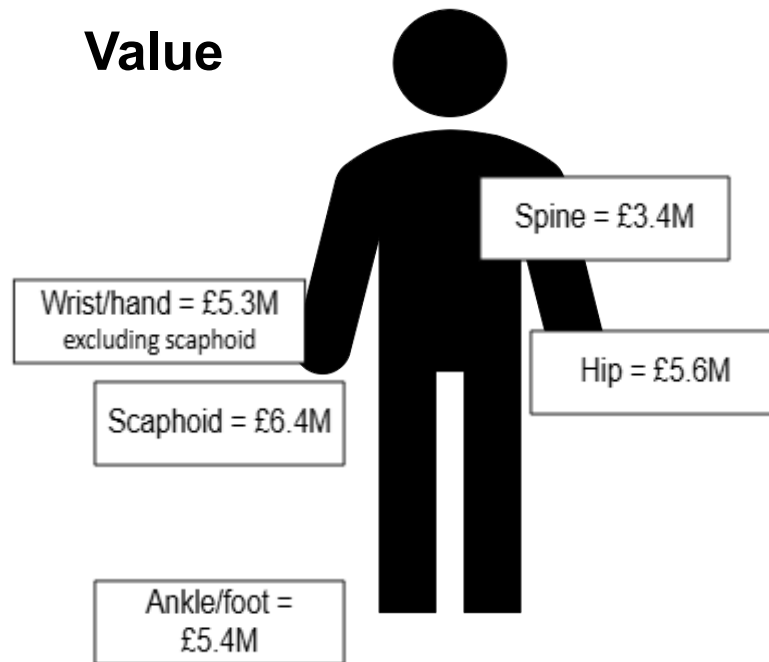
|                                                                                                                                        |                                                                                         |                                        |                                              |                                                                                                         |
|----------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|----------------------------------------|----------------------------------------------|---------------------------------------------------------------------------------------------------------|
| <b>2022 Missed Fracture Report</b><br><br>2 years of claims data<br><br>Specialties: Emergency Medicine                                | Between 2015/16 and 2017/18 there were <b>78</b> closed claims where damages were paid  | <b>Total Cost</b><br><br>£1.1 million  | <b>Total damages paid</b><br><br>£469,611    | <b>Injury site by volume of claims</b><br><br>1. Hip (n=19)<br>2. Finger (n=10)<br>3. Spine (n=10)      |
| <b>2026 Missed Fracture Analysis</b><br><br>5 years of claims data<br><br>Specialties: Emergency Medicine<br>Orthopaedics<br>Radiology | Between 2017/18 and 2022/23 there were <b>826</b> closed claims where damages were paid | <b>Total Cost</b><br><br>£43.1 million | <b>Total damages paid</b><br><br>£18 million | <b>Injury site by volume of claims</b><br><br>1. Ankle (n=133)<br>2. Hip (n=125)<br>3. Scaphoid (n=106) |

# 2026 analysis: Top five injury sites

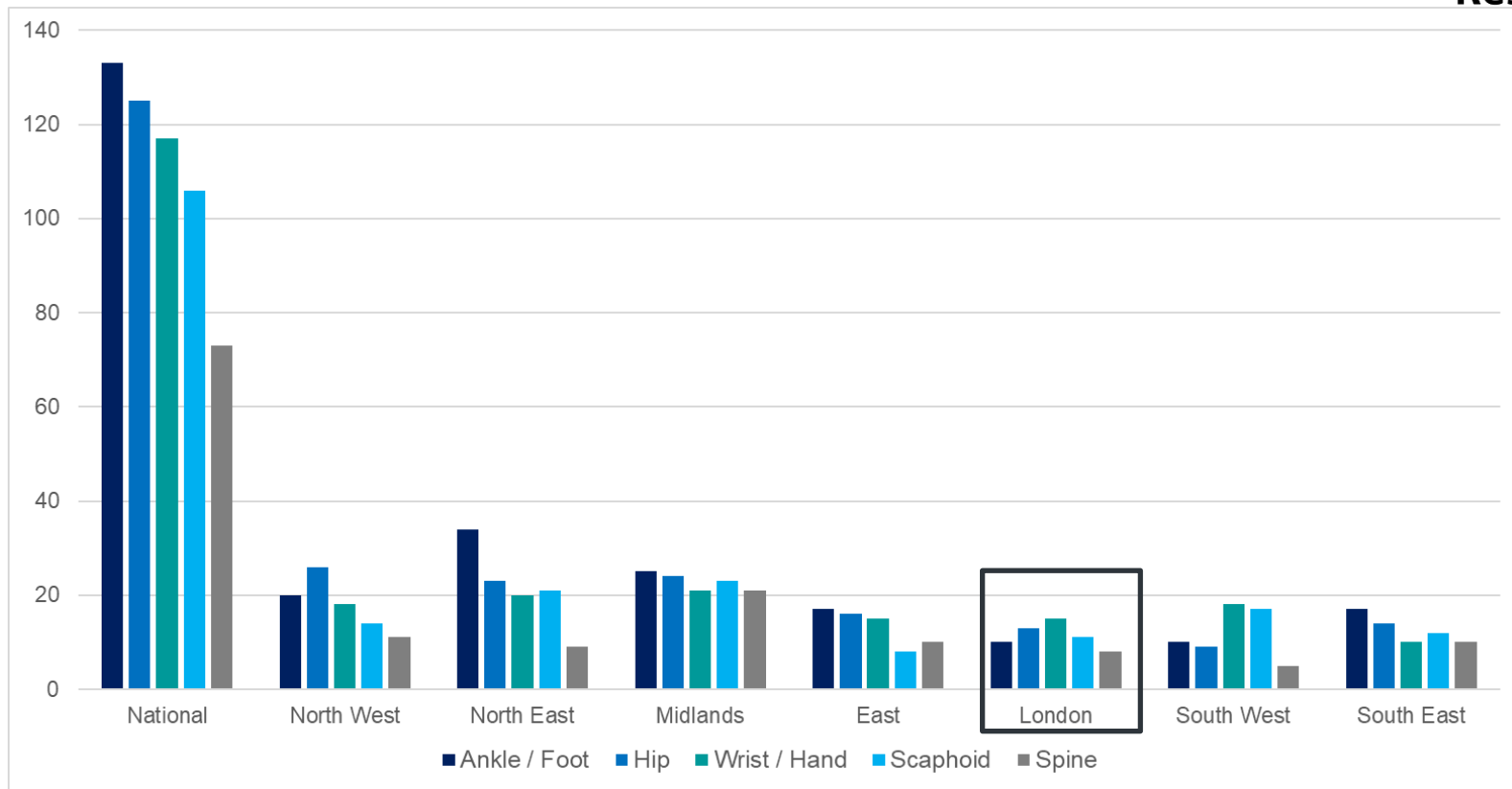
## Volume



## Value



# Top five injury sites by region



# Regional insights – London

**85** closed claims  
with damages paid

Total cost of closed claims  
= **£5.5 million**

Total damages paid  
= **£2.6 million**

**41** female claimants  
Average age = **51** years

**44** male claimants  
Average age = **42** years

## Top 5 missed fracture claims by injury site

Scaphoid = 11 claims  
Total cost = £704,519

Wrist /hand= 15 claims  
Total cost = £751,391



Spine = 8 claims  
Total cost =£853,786

Hip = 13 claims  
Total cost = £775,874

Ankle / foot = 10 claims  
Total cost = £444,455

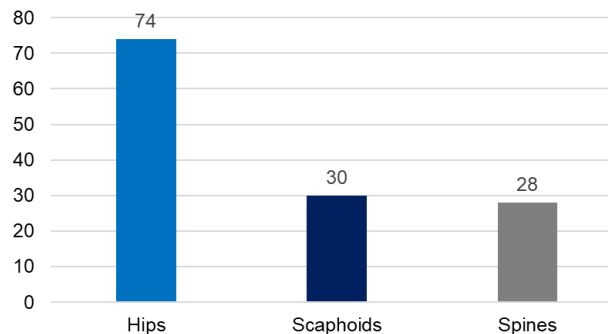


# Overview of 132 missed fracture claims

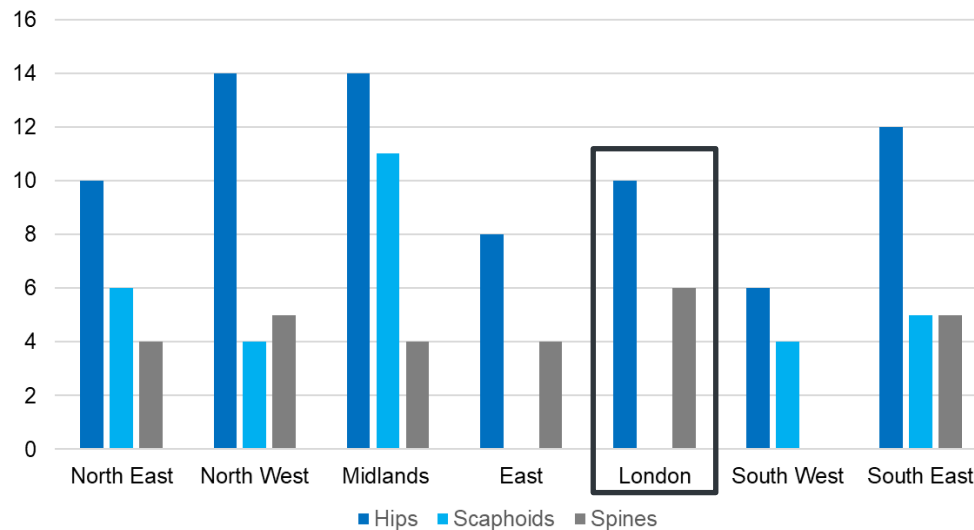
Average age = 58 years  
Range = 14 years to 94 years

♀ = 75

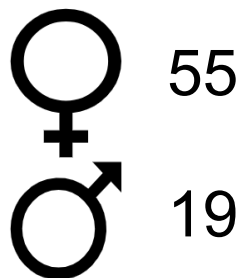
♂ = 57



Missed fracture claims by region

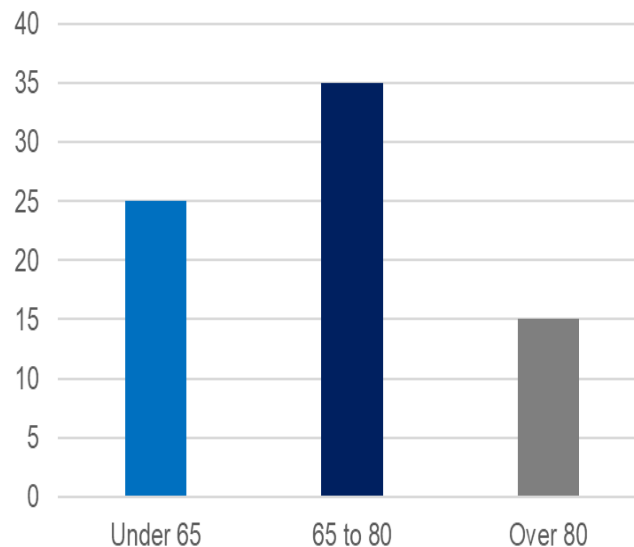


# Overview of 74 missed hip fracture claims

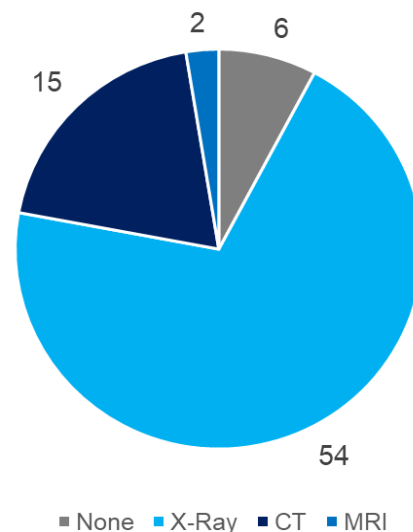


Mechanism  
Fall  
Resistance  
Running

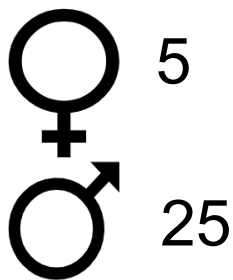
Claimant age at incident



Imaging performed at initial presentation

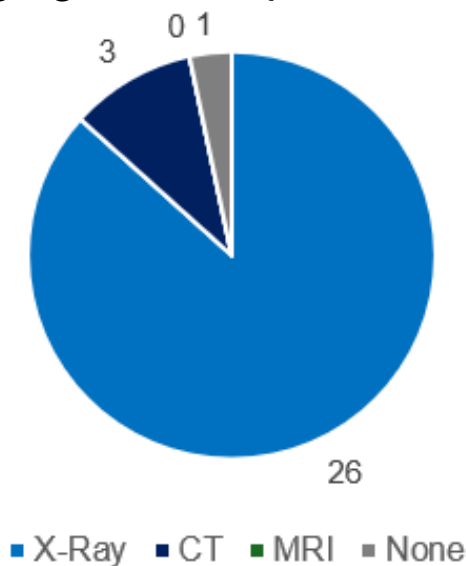


# Overview of 30 missed scaphoid fracture claims

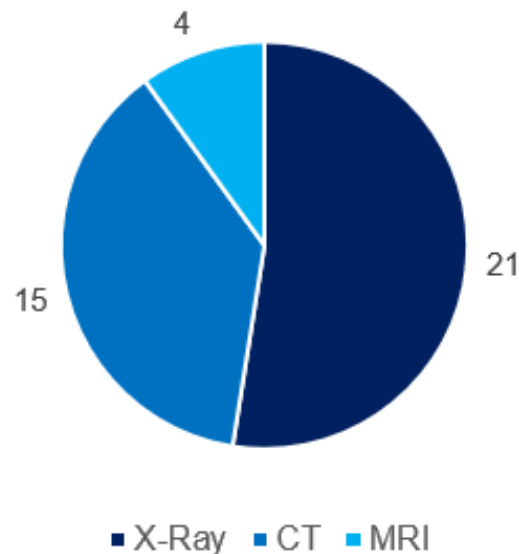


Mechanism  
FOOSH  
Non-weight  
bearing impact  
RTA

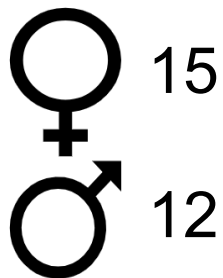
Imaging at initial presentation



Subsequent imaging

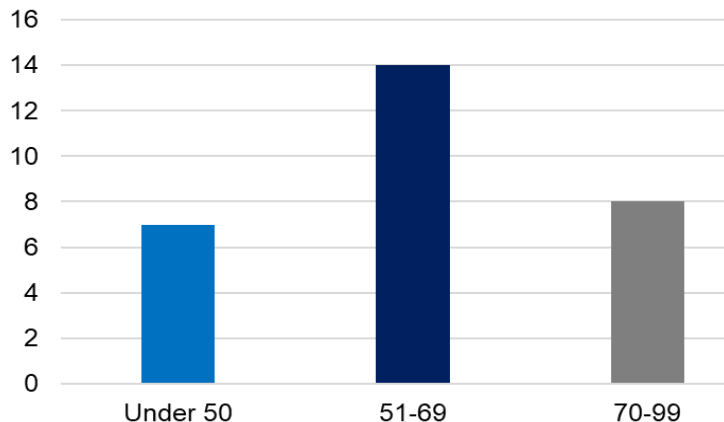


# Overview of 28 missed spinal fracture claims

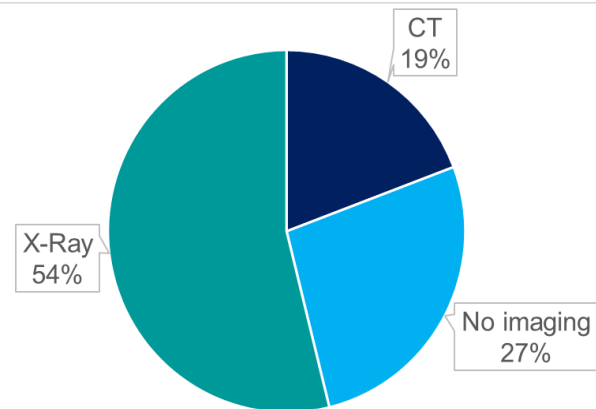


*Mechanism*  
Majority had  
a fall from  
under 3m

Claimant age at incident



Imaging performed at  
initial presentation



# Themes within missed fracture claims

Primary care review  
in 50% of claims

Ambulance service  
involvement in 15%  
of claims

Poor bone health  
indicated across  
claims

| Theme                      | 2022 Report | 2026 Analysis |
|----------------------------|-------------|---------------|
| Clinical examination       | ✓           | ✓             |
| Imaging request            | ✓           | ✓             |
| Imaging review             | ✓           | ✓             |
| Delay in follow-up         | ✓           | ✓             |
| Communication and teamwork | ✓           | ✓             |

# What's next?

Population health management lens to the analysis

Potential impact of optimising bone health in fracture prevention

What do you think would be helpful outputs from this updated analysis?

# Missed fractures; guidelines and consequences

**Bob Handley**  
National Clinical Lead for Adult  
Orthopaedic Trauma



# Bob Handley..... who am I?

- Currently
  - National clinical lead GIRFT Orthopaedic Trauma
  - Old
- Previously
  - Medical student 1972
  - Member NICE GDG for Hip Fractures
  - Co-chair of the two NICE GDG's for Fractures
  - Chair of BOA Trauma Committee (write BOASTs)
  - Consultant T&O Surgeon Oxford 1994-2025.



# Do we need education? Two histories;

- Scaphoid fracture



- Hip fracture



# Scaphoid # - everyone knows

- 1972 lecture and MDU presentation (Personal communication)
- and every doctor I have questioned who trained subsequently
- not a diagnosis of deduction but one of exclusion
- Sx but negative X-ray – immobilise and re-Xray 10/7
- Then technology....

# NICE review question 2016

a) What is the most clinically and cost-effective imaging strategy for patients with clinically suspected scaphoid fracture?

## **Recommendations and link to evidence** NICE 2016 NG38

9. Consider MRI for first-line imaging in people with suspected scaphoid fractures following a thorough clinical examination.

One original cost-utility analysis found that immediate MRI was cost effective compared to immediate CT (£3,854 per QALY) for diagnosing people with a suspected scaphoid fracture. It also found that immediate MRI was dominant compared to indeterminate X-ray followed by MRI, indeterminate X-ray followed by CT, and indeterminate X-ray followed by fracture clinic follow up. This study was assessed as directly applicable with potentially serious limitations.

# Comparison of CT and MRI in diagnosing occult hip fracture: a systematic review and meta-analysis

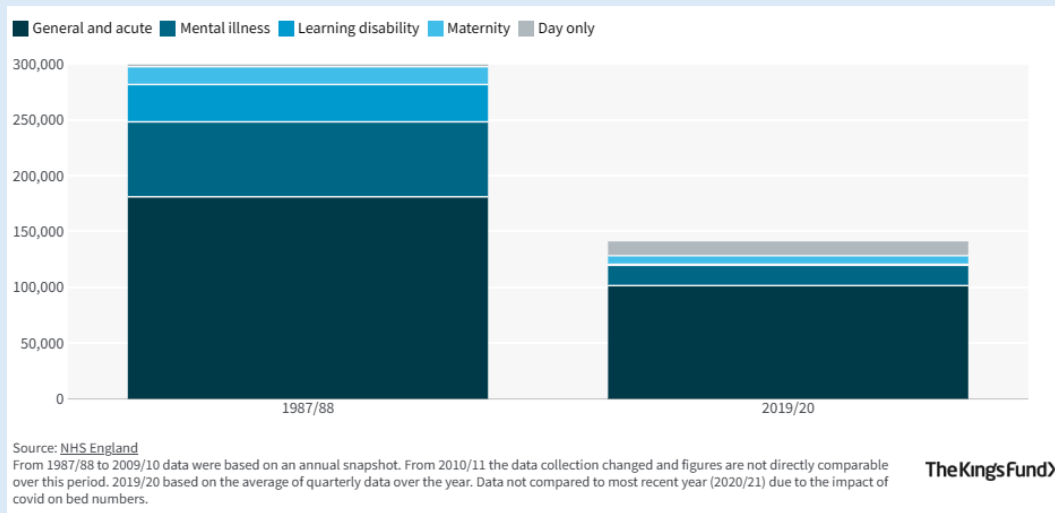
[Hongxue Qu](#)<sup>1</sup>, [Lei Bian](#)<sup>2</sup>

. 2024 Jul 15;16(7):2745–2755. doi: [10.62347/NUBB1946](#)

Both CT and MRI showed good diagnostic efficacy for occult hip fractures. However, MRI consistently outperformed CT, exhibiting significantly higher sensitivity, specificity, and likelihood ratios, thereby providing superior accuracy in confirming or excluding occult fractures.

# Hip fracture

- 1972 aware hip pathology may present with knee symptoms (kids)
- NWB older fall patient no fracture on initial image
  - lots of beds – admitted – re-X-ray if no progress
- Then there were beds and technology
- Not many beds investigate if negative try and send home
- Worry about adequacy of initial image.



# Hip fracture

- 1972 aware hip pathology may present with knee symptoms (kids)
- NWB older fall patient no fracture on initial image
  - lots of beds – admitted – re-X-ray if no progress
- Then there were beds and technology
- Not many beds investigate if negative try and send home
- Worry about adequacy of initial image.



# NICE Hip fracture guideline – review question 2009

- In patients with a continuing clinical suspicion of hip fracture, despite negative radiographic findings, what is the clinical and cost-effectiveness of additional imaging (radiographs after at least 48 hours, RNS, US and CT, compared to MRI, in confirming, or excluding, a hip fracture?

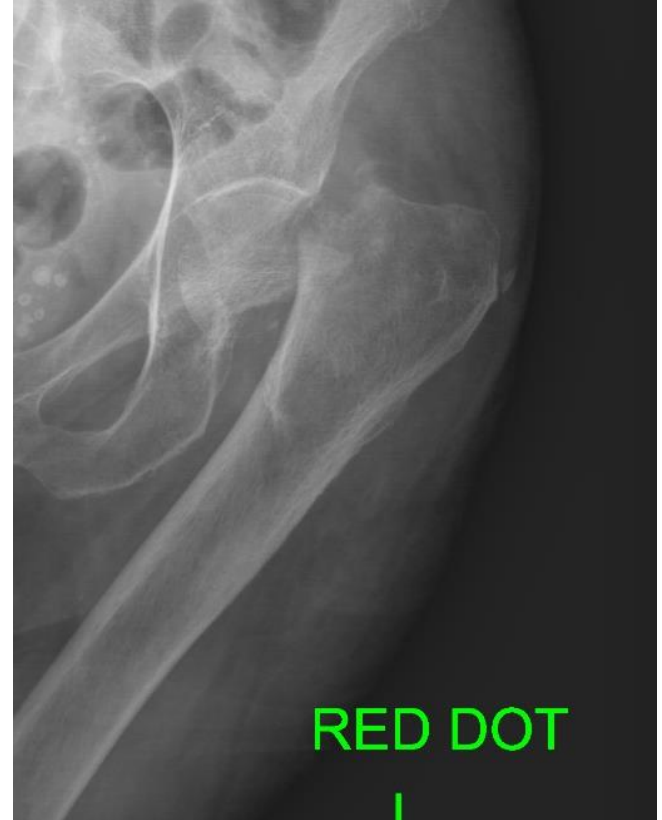
# NICE HIP Fracture Guideline CG124 2011

- Offer magnetic resonance imaging (MRI) if hip fracture is suspected despite negative anteroposterior pelvis and lateral hip X-rays. If MRI is not available within 24 hours or is contraindicated, consider computed tomography (CT).

MRI is too much trouble, how about CT  
A confident miss



4 weeks



What about repeat plain X-ray – a less confident miss – NICE 2001 said

- Repeat radiographs after 48 hours have limited sensitivity and carry the risks of displacement during the intervening period, as well as those of delay to surgery.

# Why not just do it?

- Too expensive?
- Whose patient is it whilst we are waiting?
- Who feels the pain?

# Why is it a “miss”, and what are the consequences?

- Following the guidelines but making a mistake
- Not following the guidelines
- Follow up (when can you test and discharge)
- Do we really know the clinical consequences of a “Miss”?

# Summary and Potential actions

- Guideline review
- Directed research
- End the “Turf wars” leading to admission fear
- Where pathways exist, all involved clinically should be participate in governance

Mitigating  
the Risk of  
Missed  
Fractures

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# In the Emergency Department

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Dr Samira Akberali

Clinical Lead Royal London  
Hospital Emergency  
Department, London Region  
Chair RCEM



## Why Missed Fractures Occur

- Subtle radiographic findings
- High patient volume and cognitive load
- Incomplete imaging views
- Paediatric anatomical complexity
- Delayed radiology reporting

## Clinical Risk and Impact

- Delayed diagnosis and treatment
- Poor functional outcomes
- Potential need for surgery
- Patient complaints and litigation
- Re-attendance to emergency departments



## Appropriate Clinician Skill and Training

- Radiograph interpretation training – ‘all the classics’
- Senior review for uncertain cases
- Awareness of common pitfalls
- Structured approaches to image interpretation
- Paediatric radiograph familiarity

# Real-Time Radiology Reporting

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- On-site radiology reporting where available – ideally real time

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- Teleradiology support overnight (for sites without out of hours in house radiology)

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- Direct discussion with radiologists for equivocal films

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- Faster identification of subtle fractures, the Red Dot!, AI Flags

## Consistent Radiology Result Checking

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- Daily review of radiology reports

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- Comparison of ED interpretation vs radiologist report

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- Alert systems for unexpected/ Significant findings

- 
- Process for prompt patient recall if required

## Clear Referral and Follow-Up Pathways

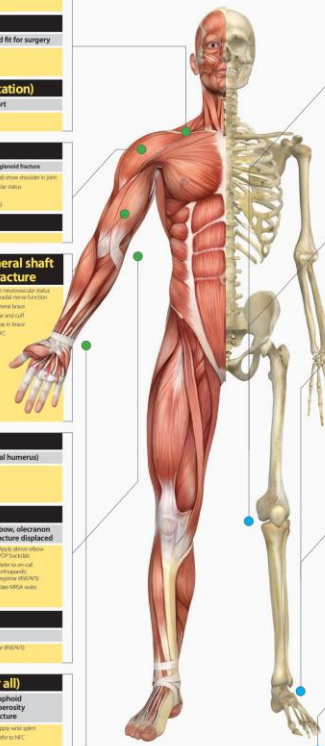
- Defined orthopaedic referral processes
- Rapid fracture clinic appointments (24–72 hrs)
- Virtual fracture clinics
- Dedicated paediatric review clinics



+  
adolescent  
skeletal mature  
children

## Upper limb injuries

| Clavicle                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                           |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Lateral clavicle fracture (AP, Velpau + int rotation)</b>                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                           |
| <b>Minimally displaced (less than 5mm) or non-surgical candidate</b>                                                                                                                                             | <b>Displaced (acromioclavicular ligaments disrupted)</b>                                                                                                                                                                                                                                                                  |
| <ul style="list-style-type: none"> <li>Apply broad immobilising</li> <li>Refer to NCC</li> </ul>                                                                                                                 | <ul style="list-style-type: none"> <li>Apply broad immobilising</li> <li>Refer to an orthopaedic registrar (OR/NM)</li> <li>Take XRAY views</li> </ul>                                                                                                                                                                    |
| <b>Mid-shaft clavicle fracture (AP + inclined x-ray)</b>                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                           |
| <b>Undisplaced or non-surgical candidate</b>                                                                                                                                                                     | <b>Completely displaced (translated) or 1cm shortened and fit for surgery</b>                                                                                                                                                                                                                                             |
| <ul style="list-style-type: none"> <li>Apply broad immobilising</li> <li>Refer to NCC</li> </ul>                                                                                                                 | <ul style="list-style-type: none"> <li>Apply broad immobilising</li> <li>Refer to NCC</li> <li>1 setting of air splint to call orthopaedic registrar (OR/NM)</li> </ul>                                                                                                                                                   |
| <b>Acromioclavicular joint (ACJ) injury (AP/Velpau + int rotation)</b>                                                                                                                                           |                                                                                                                                                                                                                                                                                                                           |
| <b>Undisplaced (Grade 1 &amp; 2 sprain) or non-surgical candidate</b>                                                                                                                                            | <b>Displaced (Grade 3-4) or elite sport</b>                                                                                                                                                                                                                                                                               |
| <ul style="list-style-type: none"> <li>Apply broad immobilising</li> <li>Discharge from ED if no clinical concerns, otherwise refer to NCC</li> </ul>                                                            | <ul style="list-style-type: none"> <li>Apply broad immobilising</li> <li>Refer to NCC</li> </ul>                                                                                                                                                                                                                          |
| Shoulder                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                           |
| <b>Shoulder dislocation (AP + Velpau axial)</b>                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                           |
| <b>Traumatic shoulder dislocation, first time or recurrent</b>                                                                                                                                                   | <b>Traumatic dislocation with bony fracture or gross fracture</b>                                                                                                                                                                                                                                                         |
| <ul style="list-style-type: none"> <li>Reduce post reduction xray (AP + Velpau axial) show shoulder in place</li> <li>Apply collar and cuff + document neurovascular status</li> <li>Refer to NCC</li> </ul>     | <ul style="list-style-type: none"> <li>Reduce post reduction xray (AP + Velpau axial) show shoulder in place</li> <li>Apply collar and cuff + document neurovascular status</li> <li>Emergency CT shoulder</li> <li>Refer to an orthopaedic registrar (OR/NM)</li> </ul>                                                  |
| <b>Shoulder injury, no fracture (AP + Velpau axial)</b>                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                           |
| <ul style="list-style-type: none"> <li>Bony injury</li> <li>Discharge</li> </ul>                                                                                                                                 | <ul style="list-style-type: none"> <li>Discharge from ED if no clinical concerns, otherwise refer to NCC</li> </ul>                                                                                                                                                                                                       |
| Humerus                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                           |
| <b>Proximal humerus fracture (AP + Velpau axial)</b>                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                           |
| <b>Greater tuberosity fracture</b>                                                                                                                                                                               | <b>Humeral shaft fracture</b>                                                                                                                                                                                                                                                                                             |
| <b>Undisplaced GT</b>                                                                                                                                                                                            | <b>Undisplaced GT</b>                                                                                                                                                                                                                                                                                                     |
| <b>No history of dislocation</b>                                                                                                                                                                                 | <b>History of dislocation or subluxation or bony Bankart lesion (glenoid rim fracture)</b>                                                                                                                                                                                                                                |
| <ul style="list-style-type: none"> <li>Apply collar and cuff</li> <li>Refer to NCC</li> </ul>                                                                                                                    | <ul style="list-style-type: none"> <li>Apply collar and cuff</li> <li>Emergency CT shoulder</li> <li>Refer to an orthopaedic registrar (OR/NM)</li> <li>Take XRAY views</li> </ul>                                                                                                                                        |
| <b>Displaced GT</b>                                                                                                                                                                                              | <b>Displaced GT</b>                                                                                                                                                                                                                                                                                                       |
| <ul style="list-style-type: none"> <li>Apply collar and cuff</li> <li>Emergency CT shoulder</li> <li>Refer to an orthopaedic registrar (OR/NM)</li> <li>Take XRAY views</li> </ul>                               | <ul style="list-style-type: none"> <li>Document neurovascular status</li> <li>Apply collar and cuff</li> <li>Apply humeral brace</li> <li>Apply collar and cuff</li> <li>Refer to NCC</li> </ul>                                                                                                                          |
| Surgical neck fracture                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                           |
| <b>2-part fracture</b>                                                                                                                                                                                           | <b>3 or 4-part minimally displaced</b>                                                                                                                                                                                                                                                                                    |
| <ul style="list-style-type: none"> <li>Apply collar and cuff</li> <li>Refer to NCC</li> </ul>                                                                                                                    | <ul style="list-style-type: none"> <li>Emergency CT shoulder</li> <li>Apply collar and cuff</li> <li>Refer to an orthopaedic registrar (OR/NM)</li> <li>Take XRAY views</li> </ul>                                                                                                                                        |
| <b>3 or 4-part displaced</b>                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                           |
| <ul style="list-style-type: none"> <li>Emergency CT shoulder</li> <li>Apply collar and cuff</li> <li>Refer to an orthopaedic registrar (OR/NM)</li> <li>Take XRAY views</li> </ul>                               |                                                                                                                                                                                                                                                                                                                           |
| Elbow                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                           |
| <b>Elbow dislocation</b>                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                           |
| <b>Simple dislocation, no fracture</b>                                                                                                                                                                           | <b>Associated fracture (radial head, coronoid, ulna, distal humerus)</b>                                                                                                                                                                                                                                                  |
| <ul style="list-style-type: none"> <li>Reduce elbow + document neurovascular status</li> <li>Reduce elbow and apply above elbow POP bandaging</li> <li>Apply broad immobilising</li> <li>Refer to NCC</li> </ul> | <ul style="list-style-type: none"> <li>Reduce elbow and apply above elbow POP bandaging</li> <li>Reduce post reduction xray (AP + Velpau axial) show elbow in place</li> <li>Apply collar and cuff + document neurovascular status</li> <li>Refer to an orthopaedic registrar (OR/NM)</li> <li>Take XRAY views</li> </ul> |
| <b>Elbow injury, no fracture</b>                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                           |
| <ul style="list-style-type: none"> <li>Apply collar and cuff</li> <li>Discharge</li> </ul>                                                                                                                       | <b>Elbow, olecranon fracture undisplaced</b>                                                                                                                                                                                                                                                                              |
| <ul style="list-style-type: none"> <li>Apply collar and cuff</li> <li>Discharge</li> </ul>                                                                                                                       | <ul style="list-style-type: none"> <li>Apply broad immobilising</li> <li>Refer to NCC</li> </ul>                                                                                                                                                                                                                          |
| <ul style="list-style-type: none"> <li>Apply collar and cuff</li> <li>Discharge</li> </ul>                                                                                                                       | <b>Elbow, olecranon fracture displaced</b>                                                                                                                                                                                                                                                                                |
| <ul style="list-style-type: none"> <li>Apply collar and cuff</li> <li>Discharge</li> </ul>                                                                                                                       | <ul style="list-style-type: none"> <li>Apply collar and cuff</li> <li>Refer to an orthopaedic registrar (OR/NM)</li> <li>Take XRAY views</li> </ul>                                                                                                                                                                       |
| <b>Elbow: radial head fracture, no dislocation</b>                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                           |
| <b>Minimally displaced (Hasson 1 and 2)</b>                                                                                                                                                                      | <b>Displaced or comminuted (Hasson 3)</b>                                                                                                                                                                                                                                                                                 |
| <ul style="list-style-type: none"> <li>Apply broad immobilising</li> <li>Refer to NCC</li> </ul>                                                                                                                 | <ul style="list-style-type: none"> <li>Apply broad immobilising</li> <li>Refer to an orthopaedic registrar (OR/NM)</li> <li>Take XRAY views</li> </ul>                                                                                                                                                                    |
| Wrist                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                           |
| <b>Wrist injury (you must document ASB tenderness for all)</b>                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                           |
| <b>No fracture seen but tenderness finding of snuffbox (ASB) tenderness</b>                                                                                                                                      | <b>No fracture seen but no ASB tenderness (wrist sprain)</b>                                                                                                                                                                                                                                                              |
| <ul style="list-style-type: none"> <li>Apply wrist splint</li> <li>Refer to NCC</li> </ul>                                                                                                                       | <ul style="list-style-type: none"> <li>Apply wrist splint</li> <li>Refer to NCC</li> </ul>                                                                                                                                                                                                                                |
| <b>Dorsal capitolunate fracture (from lateral or distal radius)</b>                                                                                                                                              | <b>Positive 'Terry Thomas' sign (scapho-lunate widening)</b>                                                                                                                                                                                                                                                              |
| <ul style="list-style-type: none"> <li>Apply wrist splint</li> <li>Refer to NCC</li> </ul>                                                                                                                       | <ul style="list-style-type: none"> <li>Apply wrist splint</li> <li>Refer to NCC</li> </ul>                                                                                                                                                                                                                                |
| <b>Distal radius fracture</b>                                                                                                                                                                                    | <b>Distal radius fracture</b>                                                                                                                                                                                                                                                                                             |
| <b>Undisplaced</b>                                                                                                                                                                                               | <b>Displaced</b>                                                                                                                                                                                                                                                                                                          |
| <ul style="list-style-type: none"> <li>Apply wrist splint</li> <li>Refer to NCC</li> </ul>                                                                                                                       | <ul style="list-style-type: none"> <li>Apply wrist splint</li> <li>Refer to NCC</li> </ul>                                                                                                                                                                                                                                |



## Lower limb injuries

| Patella                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                         |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Patella injury</b>                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                         |
| <b>Dislocation</b>                                                                                                                                                                           | <b>Fracture undisplaced: able to SLR</b>                                                                                                                                                                                                                                                                                |
| <ul style="list-style-type: none"> <li>Reduce patella dislocated</li> <li>Confirm reduction with AP and lateral knee x-ray</li> <li>Apply collar and splint</li> <li>Refer to NCC</li> </ul> | <ul style="list-style-type: none"> <li>Apply collar and splint</li> <li>Monitor weight bearing as tolerated</li> <li>Refer to NCC</li> </ul>                                                                                                                                                                            |
| <b>Fracture displaced: unable to SLR</b>                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                         |
| <ul style="list-style-type: none"> <li>Apply collar and splint</li> <li>Refer to an orthopaedic registrar (OR/NM)</li> <li>Take XRAY views</li> </ul>                                        |                                                                                                                                                                                                                                                                                                                         |
| All patients with lower limb injuries should be given VTE information or advice sheet                                                                                                        |                                                                                                                                                                                                                                                                                                                         |
| Knee                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                         |
| <b>Knee injury</b>                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                         |
| <b>Knee extensor mechanism clinically NOT intact (unable to SLR)</b>                                                                                                                         | <b>Locked knee (locked in bent position - unable to flex or extend for pain)</b>                                                                                                                                                                                                                                        |
| <ul style="list-style-type: none"> <li>Apply collar and splint</li> <li>Refer to an orthopaedic registrar (OR/NM)</li> <li>Take XRAY views</li> </ul>                                        | <ul style="list-style-type: none"> <li>Monitor the hip x-ray if indicated</li> <li>Refer to an orthopaedic registrar (OR/NM)</li> <li>Document a full set of X-rays, AP, lateral, medial, oblique, anterior, posterior, and lateral views</li> <li>Monitor weight bearing as tolerated</li> <li>Refer to NCC</li> </ul> |
| <b>Patella knees after injury - no fracture seen (painful but not locked)</b>                                                                                                                | <b>Patella knees after injury - no fracture seen (painful but not locked)</b>                                                                                                                                                                                                                                           |
| <ul style="list-style-type: none"> <li>Apply collar and splint</li> <li>Refer to an orthopaedic registrar (OR/NM)</li> <li>Take XRAY views</li> </ul>                                        | <ul style="list-style-type: none"> <li>Monitor the hip x-ray if indicated</li> <li>Refer to an orthopaedic registrar (OR/NM)</li> <li>Document a full set of X-rays, AP, lateral, medial, oblique, anterior, posterior, and lateral views</li> <li>Monitor weight bearing as tolerated</li> <li>Refer to NCC</li> </ul> |
| All patients with lower limb injuries should be given VTE information or advice sheet                                                                                                        |                                                                                                                                                                                                                                                                                                                         |
| Ankle                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                         |
| <b>Ankle injury</b>                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                         |
| <b>Ankle sprain or ligament avulsion fracture (eg tip of fibular fracture)</b>                                                                                                               | <b>Widen-A ankle fracture</b>                                                                                                                                                                                                                                                                                           |
| <ul style="list-style-type: none"> <li>Provide advice sheet 'Ankle sprain'</li> <li>Refer to NCC</li> </ul>                                                                                  | <ul style="list-style-type: none"> <li>Provide advice sheet 'Ankle sprain'</li> <li>Refer to NCC</li> </ul>                                                                                                                                                                                                             |
| <b>Widen-B ankle fracture</b>                                                                                                                                                                | <b>Widen-C ankle fracture</b>                                                                                                                                                                                                                                                                                           |
| <ul style="list-style-type: none"> <li>Provide advice sheet 'Ankle sprain'</li> <li>Refer to NCC</li> </ul>                                                                                  | <ul style="list-style-type: none"> <li>Provide advice sheet 'Ankle sprain'</li> <li>Refer to NCC</li> </ul>                                                                                                                                                                                                             |
| <b>Isolated medial malleolus fracture: x-ray the whole fibula or document absence of proximal fibular tenderness</b>                                                                         | <b>Isolated lateral malleolus fracture: x-ray the whole fibula or document absence of proximal fibular tenderness</b>                                                                                                                                                                                                   |
| <ul style="list-style-type: none"> <li>Provide advice sheet 'Ankle sprain'</li> <li>Refer to NCC</li> </ul>                                                                                  | <ul style="list-style-type: none"> <li>Provide advice sheet 'Ankle sprain'</li> <li>Refer to NCC</li> </ul>                                                                                                                                                                                                             |
| All patients with lower limb injuries should be given VTE information or advice sheet                                                                                                        |                                                                                                                                                                                                                                                                                                                         |
| Foot                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                         |
| <b>Foot injury (AP lateral + oblique views)</b>                                                                                                                                              |                                                                                                                                                                                                                                                                                                                         |
| <b>5th metatarsal base (including all types and Jones' fractures)</b>                                                                                                                        | <b>Metatarsal stress fracture</b>                                                                                                                                                                                                                                                                                       |
| <ul style="list-style-type: none"> <li>Monitor weight bearing as tolerated</li> <li>Refer to NCC</li> </ul>                                                                                  | <ul style="list-style-type: none"> <li>Monitor weight bearing as tolerated</li> <li>Refer to NCC</li> </ul>                                                                                                                                                                                                             |
| <b>Isolated 1st, 2nd, 3rd, 4th, 5th metatarsal base (including all types and Jones' fractures)</b>                                                                                           | <b>Isolated 1st, 2nd, 3rd, 4th, 5th metatarsal base (including all types and Jones' fractures)</b>                                                                                                                                                                                                                      |
| <ul style="list-style-type: none"> <li>Monitor weight bearing as tolerated</li> <li>Refer to NCC</li> </ul>                                                                                  | <ul style="list-style-type: none"> <li>Monitor weight bearing as tolerated</li> <li>Refer to NCC</li> </ul>                                                                                                                                                                                                             |
| All patients with lower limb injuries should be given VTE information or advice sheet                                                                                                        |                                                                                                                                                                                                                                                                                                                         |

See VTE prophylaxis for Lower Limb Trauma guidelines



## Governance and Safety Netting

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Complaint/litigation/Datix  
reviews

---

- Audits of missed fractures
- 

- Learning from cases
- 

- Clear patient discharge advice
    - The pattern really matters
- 

- Return precautions for  
worsening symptoms

## Key Takeaway

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Reducing missed fractures requires layered safety systems:

---

- Skilled clinicians
- 
- Reliable radiology reporting
- 
- Robust result checking
- 
- Clear referral pathways
- 
- Rapid specialist follow-up

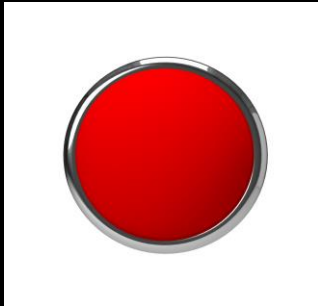
# PREVENTING MISSED FRACTURES & THE USE OF AI

---

DR MAYURUN RAMADAS

Whittington Hospital

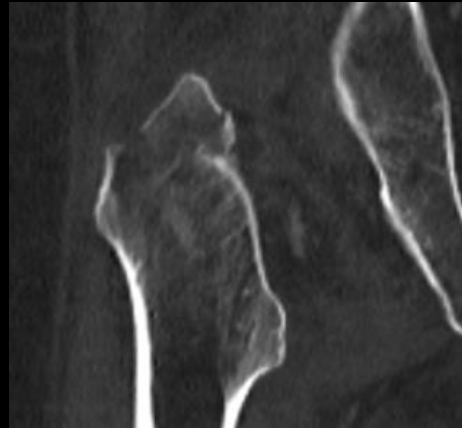
## WHY THIS MATTERS FOR NHS RESOURCE



- Missed fractures remain a major contributor to medicolegal cost and patient harm
- Most occur in high-volume plain film imaging
- The challenge: balancing diagnostic certainty, radiation exposure, workforce pressure, and system cost

# FROM THE REPORTING ROOM: PRACTICAL OBSERVATIONS

- Paediatric trauma: Plain films often first-line, but subtle fractures and interpretation variability remain common
- Spinal trauma: CT increasingly the diagnostic standard – plain films frequently inadequate for subtle injuries
- Key question: are some traditional plain-film pathways becoming obsolete?

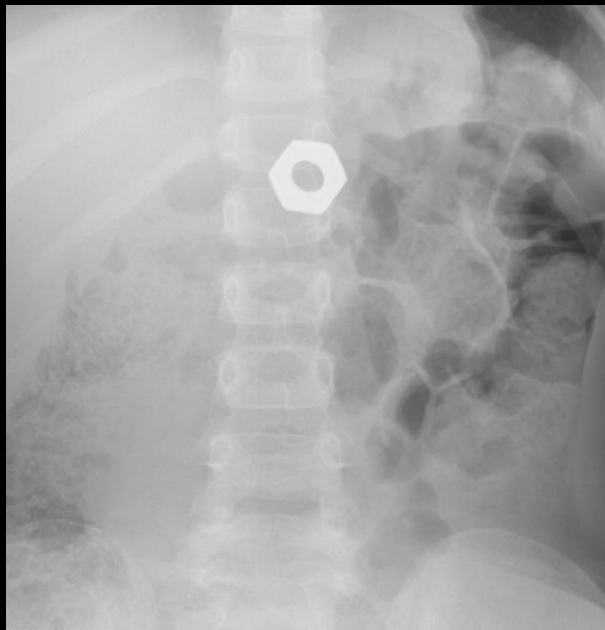


# PLAIN FILM ERRORS & HUMAN FACTORS

- Errors often occur in busy acute settings with high reporting volume
- Diagnostic confidence varies with experience, fatigue, and subspecialty expertise
- Paediatric imaging and subtle fractures particularly vulnerable



# CASE



# AI: SAFETY NET OR CONFIDENCE GAP?

- AI tools may reduce missed fractures and triage abnormal studies
- Potential resource benefit if they reduce litigation and repeat imaging
- But raises questions about radiologist confidence, reliance, and workflow integration – Training!





# CASE 1



NEGATIVE

2

ANALYZED

2

RECEIVED

DID YOU RECEIVE ALL THE IMAGES?

Please note that if Gleamer did not receive all the images in the study then the result may be inaccurate.

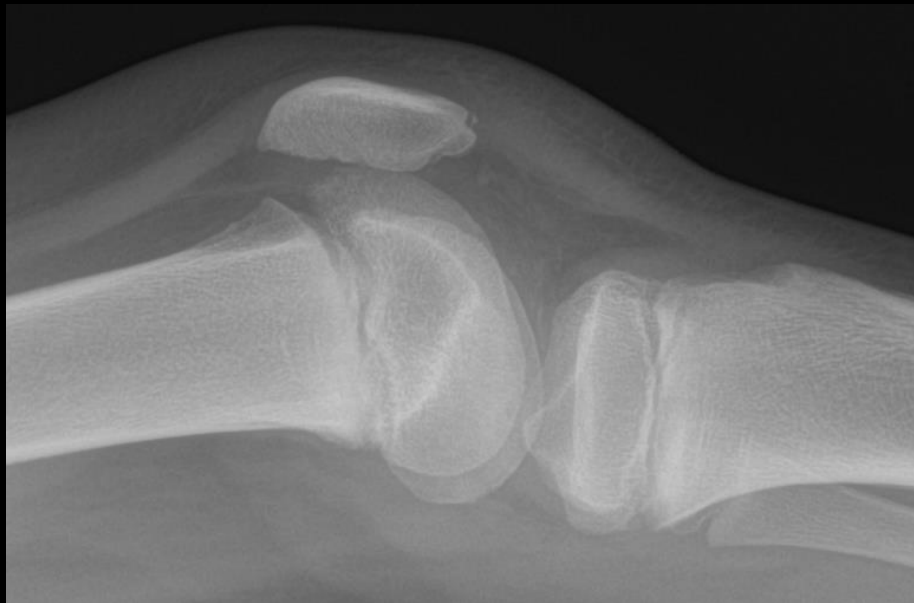
BoneView

DISLOCATION  
EFFUSION

FRACTURE  
LESION

NO

## CASE 2

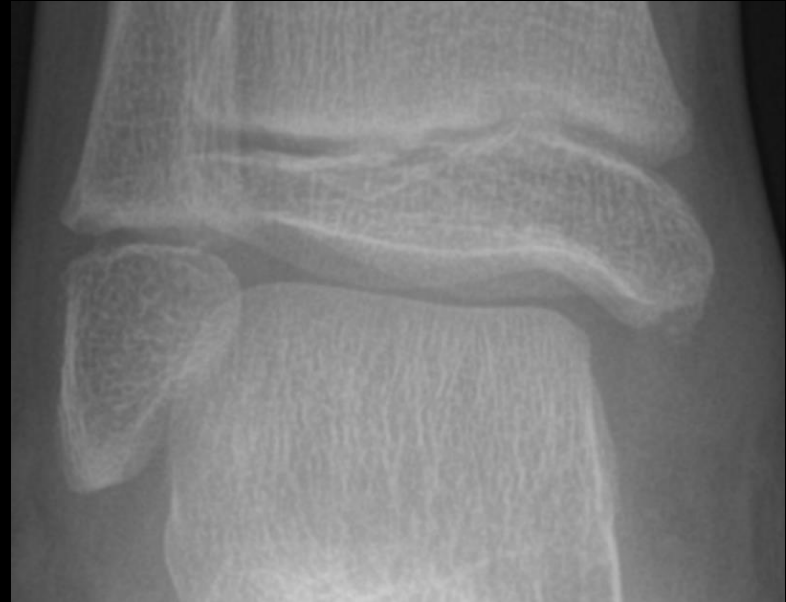


# CASE 3

## Probability

Certainty  
Suspicion  
Suggestion  
Consider

Clinically  
correlate



# RESOURCE STRATEGY MOVING FORWARD

- Optimise pathways that minimise missed injuries, not just imaging cost

COMMUNICATION – LANGUAGE --> Combative or Constructive

- Consider where CT-first strategies reduce downstream harm and cost
- Invest in AI support, training, and subspecialty expertise



## DISCUSSION QUESTION

- Should imaging policy prioritise radiation protection, lowest upfront imaging cost, or lowest total system cost including missed diagnoses and medicolegal risk?

# THANK YOU

- Q&A
- [Mayurun.ramadas@nhs.net](mailto:Mayurun.ramadas@nhs.net)

# Summary & Close

We hope you have found this event useful,  
please remember complete this short survey  
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