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# Diagnostic Error in Emergency Medicine - Using a Voluntary, Online Reporting System to Identify Diagnostic Errors in Australasian Emergency Departments

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*With thanks to the EMER Steering Group, Site Champions, ACEM and APSF*

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# *Emergency Medicine is risky business…*

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# EMER

## Emergency Medicine Events Register

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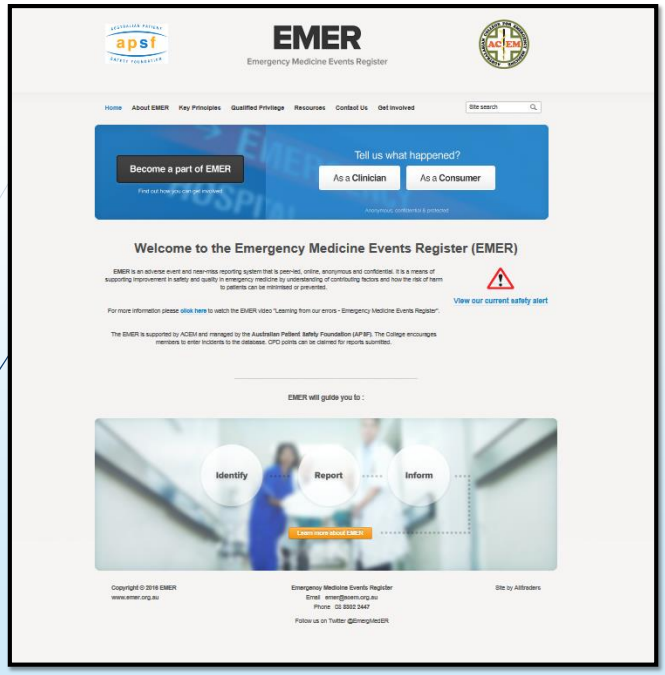
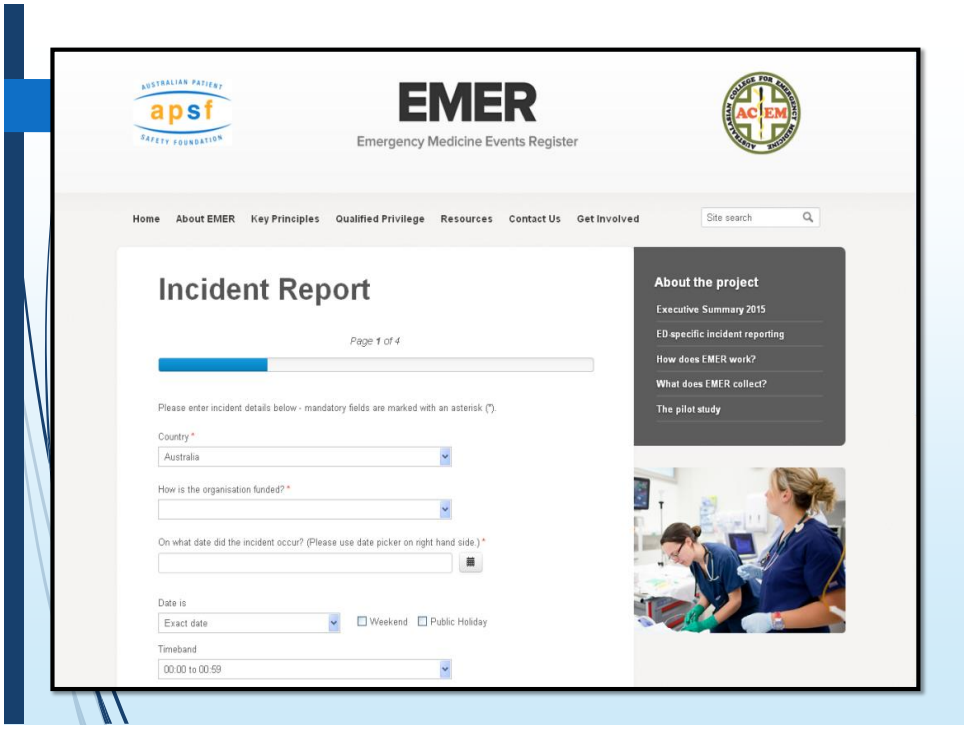
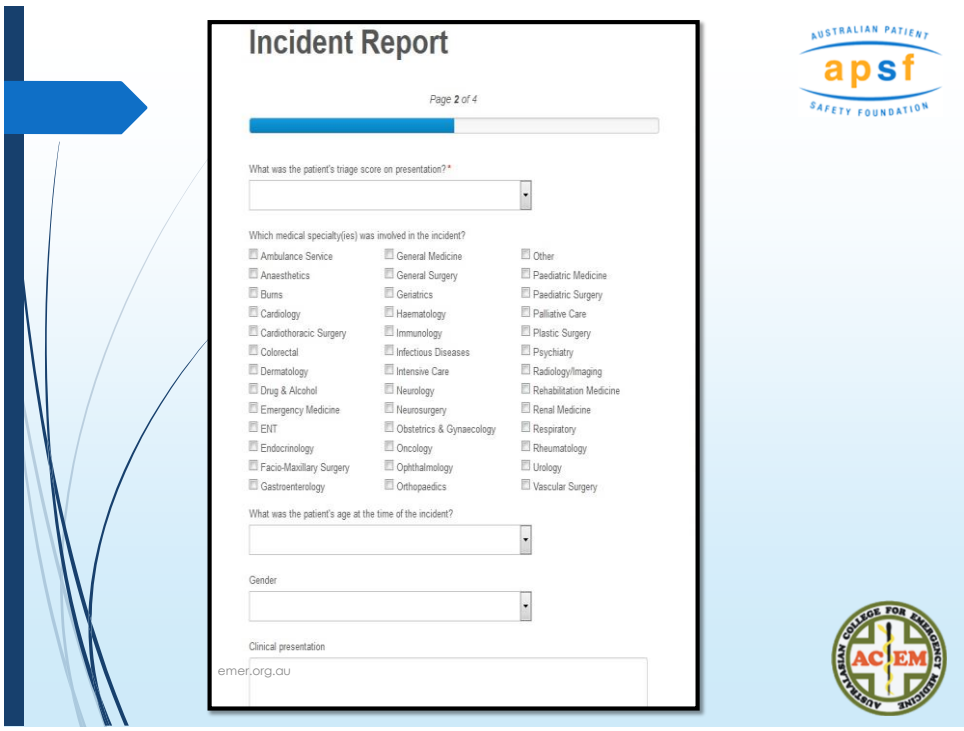



EMER
Emergency Medicine Events Register
Home
About EMER
Key Principles
Qualified Privilege
Resources
Contact Us
Get Involved
Site search
Incident Report
Page 1 of 4
Please enter incident details below - mandatory fields are marked with an asterisk (*).
Country *
Australia
How is the organisation funded? *
On what date did the incident occur? (Please use date picker on right hand side.) *
Date is
Exact date
Weekend
Public Holiday
Timeband
00:00 to 00:59
About the project
Executive Summary 2015
ED-specific incident reporting
How does EMER work?
What does EMER collect?
The pilot study


Incident Report
Page 2 of 4
What was the patient's triage score on presentation? *
Which medical specialty(ies) was involved in the incident?
Ambulance Service
Anaesthetics
Burns
Cardiology
Cardiothoracic Surgery
Colorectal
Dermatology
Drug & Alcohol
Emergency Medicine
ENT
Endocrinology
Facio-Maxillary Surgery
Gastroenterology
General Medicine
General Surgery
Geriatrics
Haematology
Immunology
Infectious Diseases
Intensive Care
Neurology
Neurosurgery
Obstetrics & Gynaecology
Oncology
Ophthalmology
Orthopaedics
Other
Paediatric Medicine
Paediatric Surgery
Palliative Care
Plastic Surgery
Psychiatry
Radiology/Imaging
Rehabilitation Medicine
Renal Medicine
Respiratory
Rheumatology
Urology
Vascular Surgery
What was the patient's age at the time of the incident?
Gender
Clinical presentation
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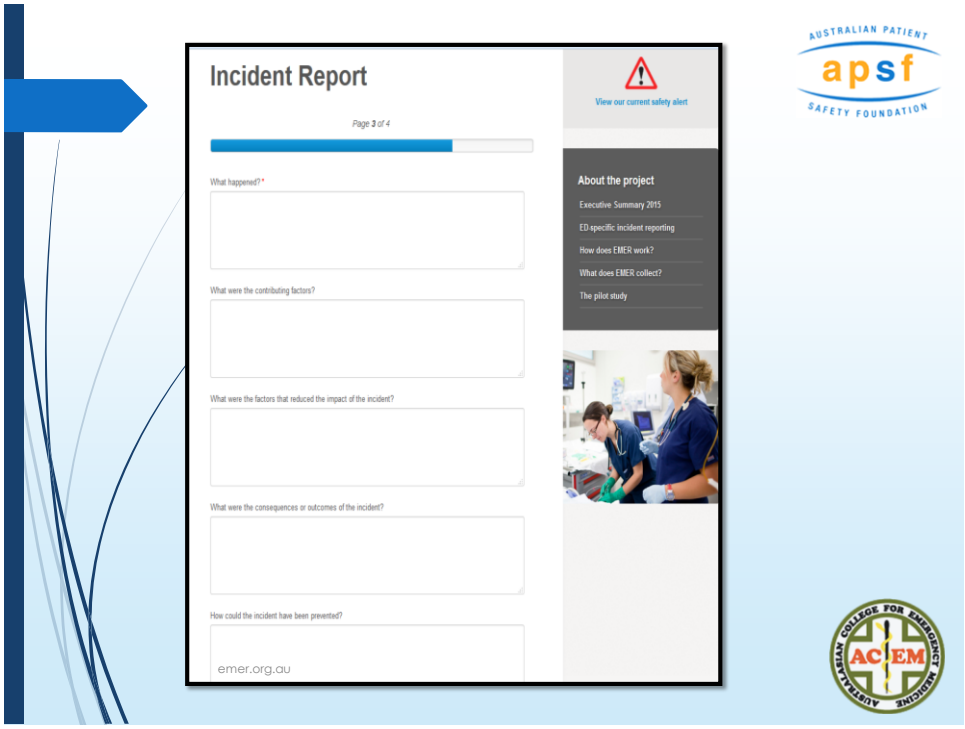
Incident Report
Page 3 of 4
What happened?*
What were the contributing factors?
What were the factors that reduced the impact of the incident?
What were the consequences or outcomes of the incident?
How could the incident have been prevented?
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View our current safety alert
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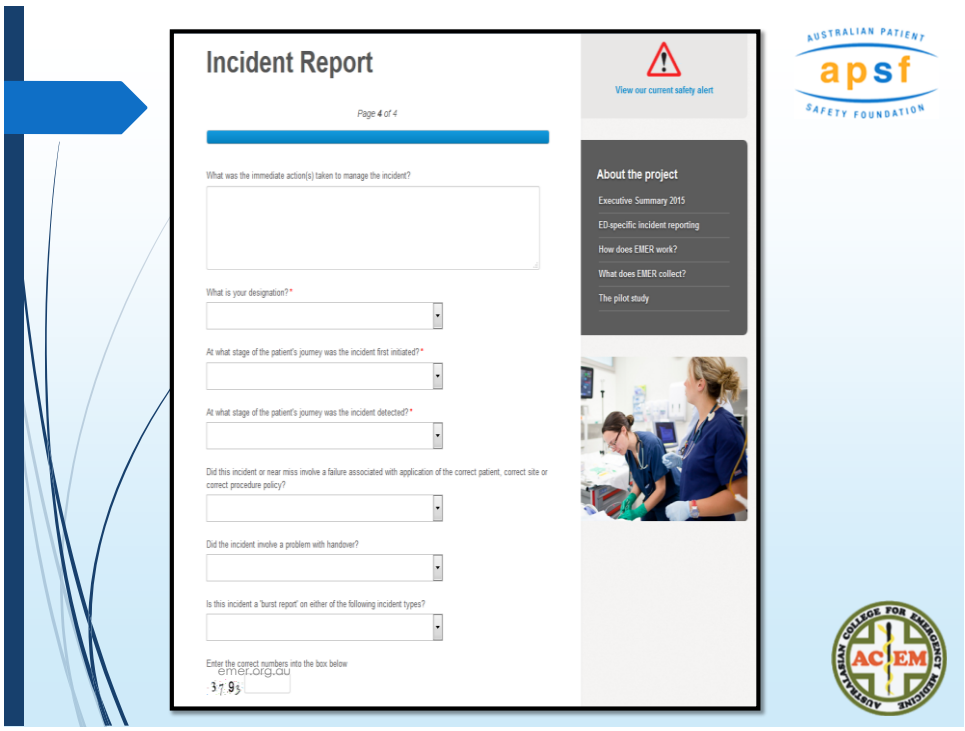
Incident Report
Page 4 of 4
What was the immediate action(s) taken to manage the incident?
What is your designation?*
At what stage of the patient's journey was the incident first initiated?*
At what stage of the patient's journey was the incident detected?*
Did this incident or near miss involve a failure associated with application of the correct patient, correct site or correct procedure policy?
Did the incident involve a problem with handover?
Is this incident a 'burst report' on either of the following incident types?
Enter the correct numbers into the box below
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37 95
View our current safety alert
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# EMER Results

December 2012 – May 2017

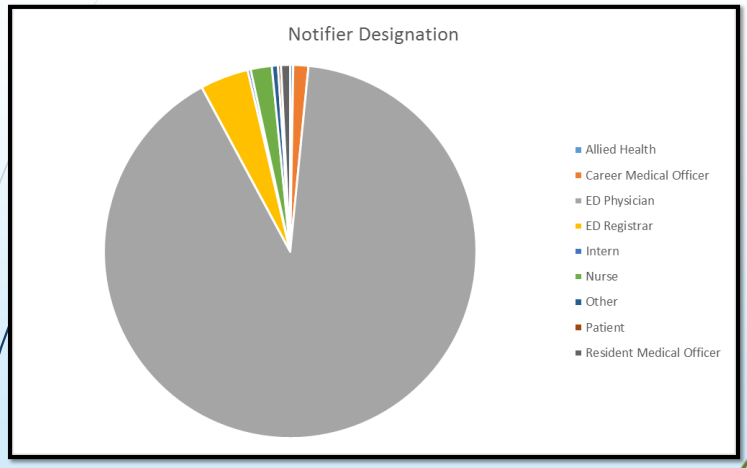
# Triage Category

**Total patients = 381**

| Triage | Count of 'What was the subjects triage score on presentation?' |
|---|---|
| Category 1 - Immediately life-threatening | 36 |
| Category 2 - Imminently life-threatening | 90 |
| Category 3 - Potentially life-threatening or important time-critical treatment or severe pain | 143 |
| Category 4 - Potentially life-serious or situational urgency or significant complexity | 81 |
| Category 5 - Less urgent | 4 |
| Unknown | 22 |
| **Grand Total** | **376** |

5 Patients no triage allocated

# Reporter

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# Device

| Device Category | Acquisition<br>Sessions |
|---|---|
| | 8,621<br>% of Total: 100.00% (8,621) |
| 1. desktop | 7,001 (81.21%) |
| 2. mobile | 1,222 (14.17%) |
| 3. tablet | 398 (4.62%) |

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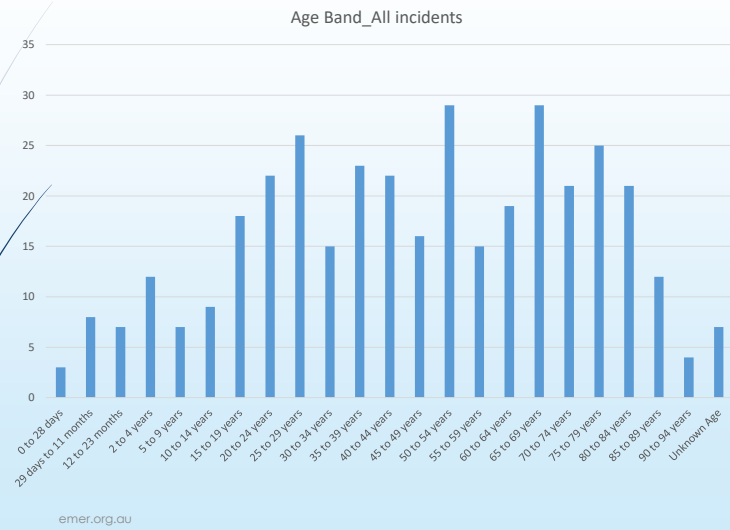
# Age Band

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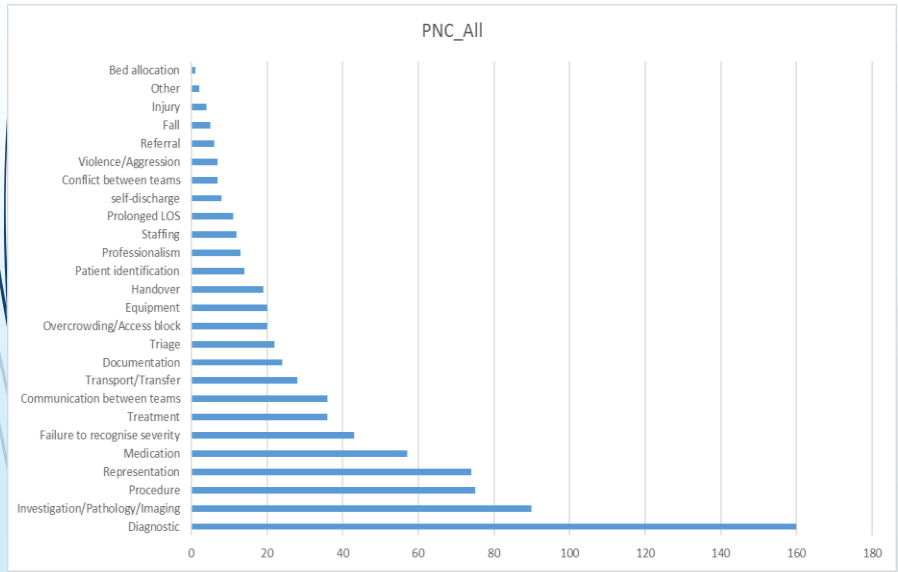
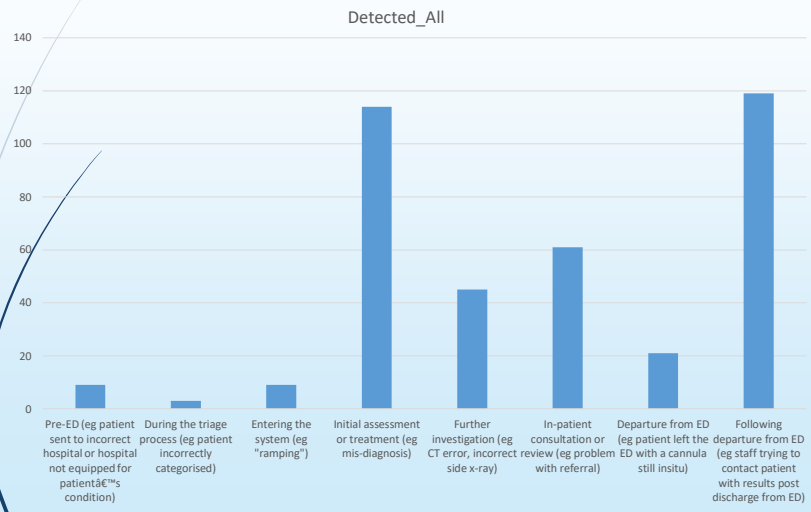
# Category



## "At what stage of the patient's journey was the event detected?




## EMER Output

# There are lessons to be learnt from medical errors and patient deaths.

- **EMER** provides the opportunity to collect incidents, which, after analysis and reporting, can be used to improve patient safety in your ED.

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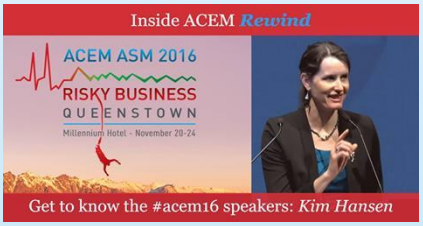
# How to we share EMER's information?

- ACEM Bulletin
- Publications - EMA, BMJ
- Conferences – ASM, ICEM, SMACC, IFSQH etc
- Site champions network, EMER newsletters
- Twitter - *Follow us @EmergMedER*
- Hospital education sessions
- Patient Safety Alerts
- Video

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EMER

Emergency Medicine Events Register

## Patient Safety Alert

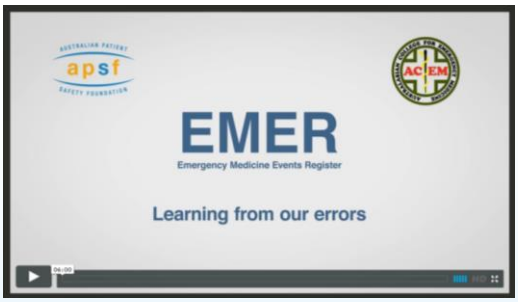
**Subject: Testicular Torsion**

Testicular torsion in young males is over-represented in the EMER database. Currently, 3% of incidents (7/235) involved a probable testicular torsion. All incidents in the EMER database are coded into categories by an expert panel. The most common incident categories in reports involving torsion is **delay to treatment, conflict between teams** and **diagnostic error.**

The management of testicular torsion is rapid surgical exploration to maximise the chance of a positive outcome. The patient should be given analgesia and kept fasted. Ultrasound scanning should not delay surgical exploration.[1] Referral and treatment pathways should be established by the ED Leadership team in advance.




Patient Safety Alert No. 1 /09/11/2015. Follow us on Twitter at @EmergMedER Information obtained from Emergency Medicine Events Registry – an online, anonymous incident reporting system for Emergency Department doctors in Australia and New Zealand. Contact: emer@acem.org.au. Reference: 1. Deakin, A. and Shepherd, M. (2015). 'Knickers in a twist'. Emergency Medicine Australasia. doi: 10.1111/1742-6723.12473





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# DIAGNOSTIC ERRORS IN EMER

Emergency Medicine Events Register

## EMER

381 incidents reported

160 diagnostic errors

27 deaths

# Diagnostic error in EMER

- Cardiovascular
- Fractures
- Sepsis

# Using voluntary reports from physicians to learn from diagnostic errors in the emergency department

- Sepsis
- Acute coronary syndromes
- Fractures

- Most diagnostic errors relate to **common disease conditions**

- Systems factors: high workload, inefficient ED processes

Okafor et al, April 2016 Emergency Medical Journal

# Diagnostic errors (N= 160)

- Acute Myocardial Infarct (8)
- Pulmonary Embolism (6)
- **Aortic dissection** (7) Carotid artery dissection (2)
- Stroke (5) **(Cardiovascular = 28)**

- **Fractures (15)**
- **Testicular torsion** (8)
- Pneumothorax (4)
- Meningitis (4) Sepsis (3) **(Sepsis =10)**
- **Epidural abscess** (3)
- Ruptured spleen (3)

# Case 1

- **"Chest pain and back pain**
- Presented via ambulance
- Triage to fast track as ***back pain*** *(only cubicle)*
- Ambulance notes lost
- Doctor saw, diagnosed as musculoskeletal pain
- CT lumbar spine
- Discharged home (positive D Dimer post discharge)
- Found dead 12 hours later.
- Aortic dissection

# Why is aortic dissection misdiagnosed?

- Lost history – chest then back pain
- Pain resolved
- Right upper quadrant pain
- "Rule out acute coronary syndrome"
- Misread imaging

## Diagnostic error: Missed fractures in emergency medicine

The following incident was submitted to the Emergency Medicine Events Register (EMER – http://www.emer.org.au). EMER is an anonymous, confidential and protected incident-reporting system that is supported by ACEM. Anyone working in emergency medicine can enter a near miss or AE by following the link from the website. It should only take 5 min and will help to inform practice and improve patient safety in emergency medicine.

The case presented in Box 1 demonstrates the failure of an ED registrar to correctly identify a triquetral fracture on X-ray. A diagnostic error is broadly defined as any mistake or failure in the diagnostic process leading to a misdiagnosis, a missed diagnosis or a delayed diagnosis. Failure to diagnose a fracture accounts for up to 80% of ED diagnostic errors,[1] occurs in 1% of all ED visits in a Norwegian hospital[2] (when 3% of fractures were missed) and is a leading cause of litigation.[1] The rate of missed fractures in emergency radiology is highest in the extremities (foot, 7.6%; hand, 5.4%; wrist, 4.1%; ankle, 2.8%), the knee (6.3%), elbow (6.0%) and hip (3.9%).[3]

This missed fracture highlights a system issue (lack of timely X-ray reporting) that could potentially result in significant patient harm. According to Reason (p. 768), a systems approach to error 'concentrates on the conditions under which individuals work and tries to build defences to avert errors or mitigate their effects'.[4] Such an approach is characteristic of high-reliability organisations, which

BOX 1. *Data reported into EMER from an adverse event*

Clinical presentation – Injured wrist
Incident description – ED registrar interpreted XR as normal – missed the triquetral fracture
Contributing factors – Small fracture, inexperience, no ED consultant review of XR, delayed reporting of XR
Action taken – Patient phoned to come in, did represent for plaster and referral to fracture clinic
Factors that reduced the impact – XR reported 24 h later by radiology, results phoned through to ED consultant, patient presented for plaster
Prevention – Further education of ED registrars, supervision by ED consultant
Consequence or Outcome – 1-day pain
Time of Incident – 00.00–00.59 hours
Reporter – ED Physician

# Missed fractures

- Delayed reporting (Radiology)
- Delayed follow up test results (ED)

# Case 3

- **"Fevers, lethargy. History aortic valve replacement**
- Seen in waiting room by junior doctor after 1 hour and after 3 hours by consultant. No treatment space to examine.
- Normal obs but only 1 set in 4 hours. Normal bloods
- **Infective endocarditis considered** but no signs seen on exam
- Sent home.
- 1/52 represented to cardiologist - infected metallic aortic valve. Died in hospital

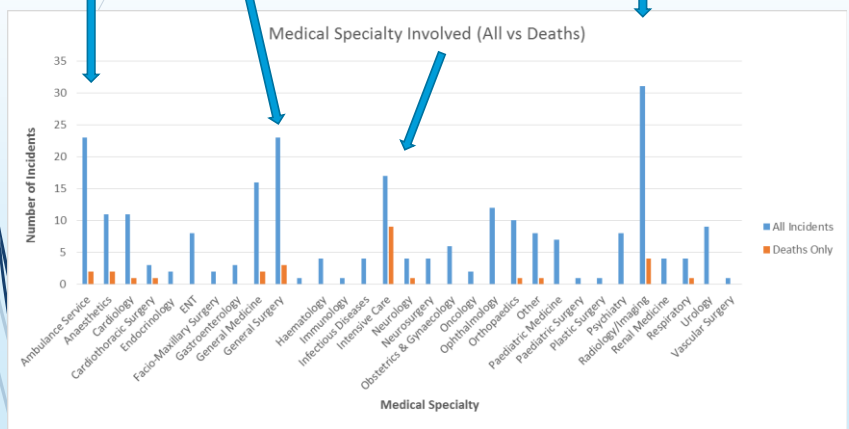
# Diagnostic Errors in EDs Contributing factors

- Overcrowding = busy ED not safe
- Supervision (*how we supervise*/ratio junior to senior)
- Inexperience / access to expertise
- Night duty + poor decision making (our ED solution)

***What conditions do we normalise, as a specialty?***

# Specialty involved

Ambulance | General Surgery | Intensive Care | Imaging



## Suspected torsion testes

- Misdiagnosis and delays to diagnosis
- Adult/ paediatric
- Urology/ general surgery
- Delays caused by obtaining ultrasound
- Delays caused by transfer

## EMER BENEFITS

# Benefits …

- Identify and analyse recurrent ***diagnostic pitfalls*** in our profession –rich repository
- Incorporate into CPD, education and training
- Responsive - Review of **Australasian Triage Scale** (Cat 2 Suspected torsion testis), safety alerts, case reports

# Benefits …

To reporter

- Debrief / healing
- Reflective practice, self enquiry

To colleagues

- Learn from each other's errors, near miss, good saves
- Address ***cognitive*** and ***systems*** contributions in EM

# Benefits …

Opportunity using incidents to work with other Specialty Colleges and State Hospital systems.

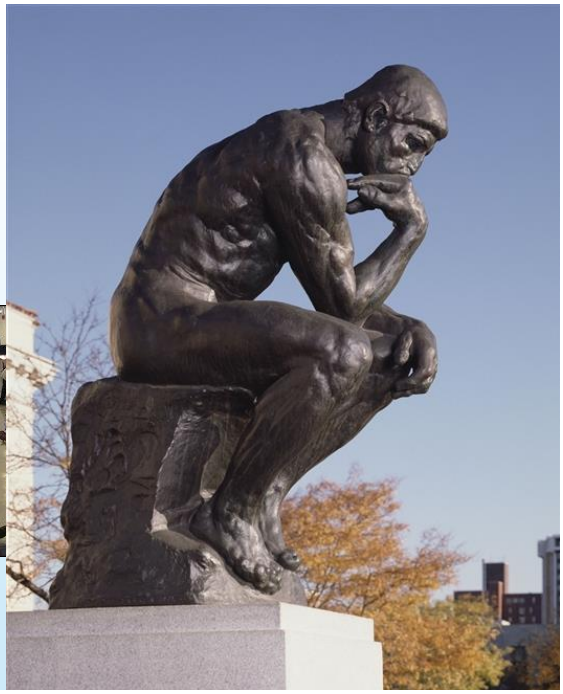
The Royal Australian and New Zealand College of Radiologists

ROYAL AUSTRALASIAN COLLEGE OF SURGEONS

# Conclusions

- Systems and cognitive contributions to diagnostic error inextricably linked in ED environment

***Improved ED processes and teamwork are imperative to reducing diagnostic error in ED***

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