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…
EMER
Emergency Medicine Events Register
Emer.org.au
Incident Report

Page 1 of 4

Country
Australia

How is the organisation funded

On what date did the incident occur? (Please use date picker on right hand side)

Date

Weekend
Public Holiday

Time
20:30 to 05:00

About the project
Executive Summary 2015
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 image score on presentation

Which medical speciality(ies) was involved in the incident?
Ambulance Service
Anaesthesic
Dentistry
Cardiac Surgery
Critical Care
Dermatology
Drug & Alcohol
Emergency Medicine
ENT
Endocrinology
Facial Plastic Surgery
Haematology
Obstetrics & Gynaecology
Radiology
Rehabilitation Medicine
Respiratory
Rheumatology
Urology
Vascular Surgery

What was the patient's age at the time of the incident

Gender

Clinical presentation
emer.org.au
Incident Report

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?

emer.org.au

Incident Report

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 noticed?

At what stage of the patient's journey was the incident detected?

Did the 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 leadership?

Is this incident a serious reportable event of the following incident types?

Enter the correct response into the box below

emer.org.au

About the project

Executive Summary 2015

EOR-specific incident reporting

How does EOR work?

What does EOR indicate?

The pilot study
**EMER Results**

December 2012 – May 2017

**Triage Category**

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

5 Patients no triage allocated

demer.org.au
“At what stage of the patient’s journey was the event detected?

Detected_All

- Pre-ED (e.g., patient sent to incorrect hospital or hospital not equipped for patient’s condition)
- During the triage process (e.g., patient incorrectly categorized)
- Entering the system (e.g., "ramping")
- Initial assessment or treatment (e.g., mis-diagnosis)
- Further investigation (e.g., CT error, incorrect side x-ray)
- In-patient consultation or review (e.g., problem with referral)
- Departure from ED (e.g., patient left the ED with a cannula still in situ)
- Following departure from ED (e.g., staff trying to contact patient with results post discharge from ED)

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.

emer.org.au

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
DIAGNOSTIC ERRORS IN EMER

Emergency Medicine Events Register

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, occurs in 1% of all ED visits in a Norwegian hospital^1 (when 3% of fractures were missed) and is a leading cause of litigation. 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%).

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

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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

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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

Medical Specialty Involved (All vs Deaths)
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.

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*