Towards evidence based emergency medicine: best BETs from the Manchester Royal Infirmary

Edited by K Mackway-Jones

Best evidence topic reports (BETs) summarise the evidence pertaining to particular clinical questions. They are not systematic reviews, but rather contain the best (highest level) evidence that can be practically obtained by busy practising clinicians. The search strategies used to find the best evidence are reported in detail in order to allow clinicians to update searches whenever necessary. Each BET is based on a clinical scenario and ends with a clinical bottom line which indicates, in the light of the evidence found, what the reporting clinician would do if faced with the same scenario again. The BETs published below were first reported at the Critical Appraisal Journal Club at the Manchester Royal Infirmary or placed on the BestBETs website. Each BET has been constructed in the four stages that have been described elsewhere. The BETs shown here together with those published previously and those currently under construction can be seen at http://www.bestbets.org. Four BETs are included in this issue of the journal.

- Terlipressin or somatostatin for the treatment of bleeding oesophageal varices
- Magnetic resonance imaging or bone scintigraphy in the diagnosis of plain x-ray occult scaphoid fractures
- Diagnostic utility of arterial blood gases for investigation of pulmonary embolus
- Intranasal midazolam in patients with fits

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Terlipressin or somatostatin for the treatment of bleeding oesophageal varices

Report by Russel Boyd, Consultant
Checked by John Butler, Consultant
doi: 10.1136/emj.2005.025692

Abstract
A short cut review was carried out to establish whether terlipressin or somatostatin is more effective at reducing acute bleeding in adults with known oesophageal varices. Altogether 170 papers were found using the reported search, of which four presented the best evidence to answer the clinical question. The author, date and country of publication, patient group studied, study type, relevant outcomes, results, and study weaknesses of these best papers are tabulated. A clinical bottom line is stated.

Clinical scenario
A 55 year old man presents to the Emergency Department with massive haematemesis. He has known oesophageal varices. He is tachycardic, peripherally shut down and continues to actively vomit fresh blood. You wonder if pharmacological treatment with terlipressin or somatostatin will be effective in reducing the bleeding.

Three part question
In [adults with known varices] is [terlipressin or somatostatin] more effective at [reducing acute bleeding]?

Search strategy

Search outcome
Altogether 170 papers were identified of which four were relevant to the clinical question. These four papers are shown in table 1.

Comment(s)
Four randomised controlled studies exist in this area. No significant difference in rates of cessation of bleeding were found between patients treated with either terlipressin or somatostatin.

> CLINICAL BOTTOM LINE
There appears to be no significant difference between terlipressin and somatostatin in their ability to control bleeding. The logistical advantage of four hourly bolus administration of terlipressin over the need for continuous infusions of somatostatin and the lower cost of terlipressin will be relevant when choosing between them.

Magnetic resonance imaging or bone scintigraphy in the diagnosis of plain x-ray occult scaphoid fractures

Report by Bernard Foex, Consultant, Peter Speake, House Officer
Checked by Rick Body, Clinical Research Fellow
doi: 10.1136/emj.2005.025700

Abstract
A short cut review was carried out to establish whether magnetic resonance scanning or bone scintigraphy is better at identifying scaphoid fractures not apparent on plain x-rays. Altogether 11 papers were found using the reported search, of which four presented the best evidence to answer the clinical question. The author, date and country of publication, patient group studied, study type, relevant outcomes, results, and study weaknesses of these best papers are tabulated. A clinical bottom line is stated.

Clinical scenario
An adult presents to the Emergency Department review clinic two weeks after falling onto his outstretched hand. A scaphoid fracture was suspected but no fracture was seen on plain scaphoid views. He continues to have scaphoid tenderness. You wonder whether a magnetic resonance scan would be better than a bone scan in confirming or excluding a scaphoid fracture.

Three part question
In an adult with a [clinically suspected scaphoid fracture] is [magnetic resonance imaging better than bone scintigraphy]{0} at [reaching a diagnosis]{0}?

Search strategy

Search outcome
Altogether 23 papers were found. Only three addressed the question. One further paper was found by searching the references. These four papers are shown in table 2.

Comment(s)
Only 145 patients appear to have been entered into any sort of comparison between the two imaging modalities. Magnetic resonance imaging appears slightly superior in diagnosing occult scaphoid fractures. Magnetic resonance imaging also allows accurate diagnosis of clinically significant soft tissue injuries, which may otherwise be missed. It is also quicker to perform than a bone scan. However, some patients with claustrophobia will not tolerate it.

<table>
<thead>
<tr>
<th>Table 1</th>
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<tbody>
<tr>
<td>Author, date, and country</td>
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<tr>
<td>Walker S et al, 1992, Germany</td>
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<tr>
<td>Padgett G et al, 1994, Italy</td>
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<td>Feu F et al, 1996, Spain</td>
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<tr>
<td>Walker S et al, 1996, Germany</td>
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Diagnostic utility of arterial blood gases for investigation of pulmonary embolus

Report by Margaret Maloba, Specialist Registrar
Checked by Kerstin Hogg, Specialist Registrar
doi: 10.1136/emj.2005.025718

Abstract
A short cut review was carried out to establish the diagnostic utility of arterial blood gas analysis in patients with suspected pulmonary embolus. Altogether 459 papers were found using the reported search, of which six presented the best evidence to answer the clinical question. The author, date and country of publication, patient group studied, study type, relevant outcomes, results, and study weaknesses of these best papers are tabulated. A clinical bottom line is stated.

Clinical scenario
A 28 year old woman presents to the Emergency Department with acute suspected pulmonary embolus (PE). You wonder whether normal arterial blood gases are sufficient to rule out PE.

Three part question
In [patients with clinical diagnosis of PE] do [arterial blood gases] aid in [making a definite diagnosis]?

Search strategy
Medline OVID1966–2005 Feb week 1 and Embase OVID 1980–2005 week 7: (exp pulmonary embolism/OR pulmonary embolus.mp.) AND (exp embolism/OR embol$.mp. OR exp thromboembolism/OR thromboembol$.mp.) AND (exp blood gas analysis/OR arterial blood gas$.mp.)

Search outcome
Altogether 459 papers were found of which six directly addressed the question. These six papers are shown in table 3.

Comment(s)
Pulmonary angiography, the gold standard diagnostic tool in PE, has unacceptably high mortality and morbidity. At present, it cannot routinely be used in clinical practice. A reliable, cost effective, non-invasive test if identified would be of great use.

CLINICAL BOTTOM LINE
Arterial blood gas analysis alone is of limited diagnostic utility in suspected PE.
Intranasal midazolam in patients with fits

Report by Martin Smith, Consultant
Checked by Simon Carley, Consultant
doi: 10.1136/emj.2005.025726

Abstract
A short cut review was carried out to establish whether intranasal midazolam was effective for stopping fits. Altogether 36 papers were found using the reported search, of which four presented the best evidence to answer the clinical question. The author, date and country of publication, patient group studied, study type, relevant outcomes, results, and study weaknesses of these best papers are tabulated. A clinical bottom line is stated.

Clinical scenario
A 14 year old boy with known epilepsy attends the Emergency Department having had a fit at school. His teacher is with him. She tells you that he was fitting for approximately 20 minutes. She also tells you that they have rectal diazepam at school but the staff were reluctant to administer it. You check the patient and find him to be postictal but otherwise well. You wonder if midazolam, which can be administered intranasally, would successfully terminate epileptic fits.

Three part question
In [a fitting patient with no intravenous access] can [intranasal midazolam] stop [the fit]?

Search strategy
Medline OVID 1966 to 2005 Feb week 2 and Embase OVID 1980–2004 Week 7: [exp epilepsy/OR epilepsy.mp OR exp seizures/OR seizure$.mp OR convulsion$.mp. OR fit$.mp.] AND [ exp midazolam/OR midazolam.mp. OR exp midazolam$mp$] stop [the fit].
benzodiazepines/OR benzodiazepines.mp. AND [exp administration intranasal/OR nasal$.mp. OR nose.mp.]

Search outcome
Altogether 36 papers were identified. On reading the abstracts four papers were found to be of interest to the question. These four papers are shown in table 4.

Comment(s)
The standard of evidence is poor. Properly conducted trials comparing the efficacy of intranasal midazolam are needed.

<table>
<thead>
<tr>
<th>Author, date, and country</th>
<th>Patient group</th>
<th>Study type (level of evidence)</th>
<th>Outcomes</th>
<th>Key results</th>
<th>Study weaknesses</th>
</tr>
</thead>
<tbody>
<tr>
<td>O’Regan ME et al, 1996, UK</td>
<td>19 epileptic children in the neurophysiology laboratory given intranasal midazolam</td>
<td>Experimental</td>
<td>Electroencephalographic (EEG) evidence or clinical cessation of fits</td>
<td>15/19 patients showed either EEG changes or clinical improvement</td>
<td>Population different from that seen as an emergency. No control of other medications. Small numbers.</td>
</tr>
<tr>
<td>Kendall JL et al, 1997, USA</td>
<td>2 patients in the Emergency Department</td>
<td>Case report</td>
<td>Clinical evidence of cessation of fits</td>
<td>Both patients stopped fitting</td>
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<tr>
<td>Scheepers M et al, 1998, UK</td>
<td>2 patients in the Emergency Department</td>
<td>Case report</td>
<td>Clinical evidence of cessation of fits</td>
<td>Both patients stopped fitting</td>
<td></td>
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<tr>
<td>Mahmoudian T and Zadeh MM, 2004, Iran</td>
<td>70 children aged 2 months to 15 years Intravenous diazepam v intranasal</td>
<td>Clinical trial</td>
<td>Time to seizure control 2.94 min v 3.58 min</td>
<td>No randomisation</td>
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**CLINICAL BOTTOM LINE**
Intranasal midazolam appears to be effective at controlling seizures.


