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.

The BETS published below were first reported at the Critical Appraisal Journal Club at the Manchester Royal Infirmary. Every BET has been constructed in the four stages that have been described elsewhere.

The four topics covered in this issue of the journal are:

1. Signs and symptoms of oesophageal coins
2. Immobilisation of suspected scaphoid fractures
3. Activated charcoal in tricyclic antidepressant overdose
4. Acute analgesia in non-traumatic abdominal pain

---

**Signs and symptoms of oesophageal coins**

Report by Vincent Choudhery, Specialist Registrar

Search checked by Sue Maurice, Consultant

**Clinical scenario**

A 3 year old boy is brought into the emergency department by his mother. She says that he swallowed a coin two hours earlier. The boy is asymptomatic. You wonder whether any investigation needs to be done to exclude oesophageal impaction.

**Three part question**

In [children who have swallowed coins] is [history and examination] accurate at [ruling out oesophageal impaction]?

**Search strategy**

Medline 1966 to 12/99 using the OVID interface. ({exp numismatics OR coin$.mp OR exp foreign bodies OR foreign body.mp OR foreign bodies.mp} AND {exp pediatrics OR paediatric$.mp OR child$.mp} AND {ingest$.mp OR swallow$.mp OR exp esophagus OR esophagus.mp OR esopha-...
Immobilisation of suspected scaphoid fractures
Report by Kathryn Gow, Medical Student
Search checked by Rob Williams, Clinical Fellow

Clinical scenario
A 25 year old man attends the emergency department with a one day old wrist injury caused by falling onto his outstretched hand. He is tender in his anatomical snuff box and also on longitudinal thumb compression, but he is in very little pain on normal everyday movements. You send him for a scaphoid series of x rays which reveal no fracture. You arrange for him to return to the department in two weeks time for a repeat radiological and clinical examination. You wonder whether his wrist should be immobilised in a plaster cast or whether some elastic support bandage will suffice.

Three part question
In [patients with clinical signs of scaphoid fracture but no fracture on first x ray] is [plaster casting] necessary for [immediate management and the prevention of long term complications]?

Search strategy
Medline 1966 to 12/99 using the OVID interface. [((exp fractures OR exp fractures, closed OR exp fractures, malunited OR exp fractures, ununited OR fracture$.mp) AND scaphoid$.mp) AND [exp casts, surgical OR cast$.mp OR plaster.mp OR exp splints OR splint$.mp OR exp immobilisation OR immobilisation.mp]] LIMIT to human AND english.

Comments
All studies show that a significant number of children with oesophageal coins are asymptomatic.

Clinical bottom line
All children with a history of coin ingestion should have further investigation to exclude oesophageal impaction.

Table 2

<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>Duncan and Thurston, 1985, UK</td>
<td>108 patients with a diagnosis of clinical fracture of the scaphoid</td>
<td>Retrospective survey</td>
<td>Proportion of patients found to have a fracture</td>
<td>0 of 108 (0%)</td>
<td></td>
</tr>
<tr>
<td>DaCruz et al, 1988, UK</td>
<td>150 wrists immobilised on plaster with suspected scaphoid fracture</td>
<td>Retrospective survey</td>
<td>Fracture rate</td>
<td>8 of 150 (5.33%)</td>
<td></td>
</tr>
<tr>
<td>Sjolin and Andersen, 1988, Denmark</td>
<td>108 clinically suspected scaphoid fractures</td>
<td>PRCT</td>
<td>Fracture rate</td>
<td>7 of 108</td>
<td>Only 2 weeks follow up</td>
</tr>
<tr>
<td>Jacobsen et al, 1995, Denmark</td>
<td>231 clinically suspected scaphoid fractures</td>
<td>Retrospective survey</td>
<td>Proportion of patients found to have a fracture</td>
<td>3 of 231 (1.3%)</td>
<td></td>
</tr>
</tbody>
</table>

PRCT = prospective randomised controlled trial.
Table 3

<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>Crone et al, 1977, UK¹</td>
<td>Health volunteers given 75 mg nortriptyline 10 g medicoal at 30 min</td>
<td>Experimental</td>
<td>Plasma nortriptyline level</td>
<td>60% decreased</td>
<td>Small dose of TCA</td>
</tr>
<tr>
<td>Crome et al, 1983, UK²</td>
<td>48 patients with suspected TCA overdose. All had gastric lavage</td>
<td>PRCT</td>
<td>Plasma TCA concentration Clinical signs</td>
<td>No difference in rate of fall noted</td>
<td>No significant difference Decreased by 99%</td>
</tr>
<tr>
<td>Karkkainen and Neuvonin, 1986, Germany³</td>
<td>6 healthy volunteers. Each took 75 mg amitriptyline 50 g charcoal within 5 min</td>
<td>Experimental</td>
<td>Plasma TCA absorption</td>
<td>No significant difference</td>
<td>Unrealistic time to charcoal</td>
</tr>
<tr>
<td>Hulten et al, 1988, Multinational⁴</td>
<td>77 patients over 14 years old with TCA overdose. All had gastric lavage 20 g charcoal ± nothing</td>
<td>PRCT</td>
<td>Plasma TCA concentration Clinical signs</td>
<td>No significant difference in peak or half life</td>
<td>No significant difference Control group differed from charcoal group at baseline</td>
</tr>
</tbody>
</table>

PRCT = prospective randomised controlled trial.

 Activated charcoal in tricyclic antidepressant overdose
Report by Claire Park, Medical Student
Search checked by Katrina Richell-Herren, Research Fellow

Clinical scenario
A 25 year old woman attends the emergency department having taken an overdose of amitriptyline. You wonder whether she will benefit from treatment with activated charcoal.

Three part question
In [adults who have taken a tricyclic antidepressant (TCA) overdose] is [activated charcoal] effective at [reducing drug absorption and reducing complication rates]?

Search strategy
Medline 1966 to 12/99 using the OVID interface. (Exp antidepressant, tricyclic$ OR TCA$ OR exp desipramine OR exp nortriptyline OR desipramine OR amitriptyline) AND [exp charcoal OR charcoal.mp]) LIMIT to human AND english.

Search outcome
Altogether 79 papers were found of which 69 were irrelevant and six of insufficient quality for inclusion. The remaining four papers are shown in table 3.

Comment
There are two types of study reported. The first is experimental and shows significant effect from rapid administration of charcoal to volunteers taking therapeutic doses of TCAs. The second type is clinical and show no benefit from charcoal administered at various times after overdose of TCAs. However both clinical studies use low charcoal doses after gastric lavage.

Clinical bottom line
There is no convincing evidence that activated charcoal is effective in preventing TCA absorption or complication rates after TCA overdose. More work is needed in this area.


Analgesia and assessment of abdominal pain
Report by Kevin Mackway-Jones, Consultant
Search checked by Magnus Harrison, Research Fellow

Clinical scenario
A 12 year old girl presents to the emergency department with “tummy ache”. The history and examination are suggestive of appendicitis. You call the surgical team but they are unable to attend for one hour as they are busy in theatre. You wonder if giving analgesia will affect the accuracy of the surgical diagnosis.

Three part question
In a [patients with abdominal pain] does [analgesia prior to surgical consultation] affect [the accuracy of surgical diagnosis]?

Search strategy
Medline 1966 to 12/99 using the OVID interface. (exp abdominal pain OR abdominal pain$ OR exp peritonitis OR peritonitis.mp) OR [(exp pain OR pain$.mp) AND (abdom$ OR exp stomach OR stomach.mp OR tummy$.mp)] AND [exp analgesia OR exp morphine OR exp analgesia, opioid OR analgesi$.mp] AND maximally sensitive RCT filter LIMIT to human and english.
Altogether 78 papers were found of which 73 were irrelevant or of insufficient quality for inclusion. The remaining five papers are shown in table 4.

**Comment**
All the studies show considerable benefit to the patient from pain relief with either no change in diagnostic accuracy or an improvement.

**Clinical bottom line**
Patients with acute, atraumatic abdominal pain should have analgesia administered without delay.

---

### Table 4

<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>Zoltie and Cust, 1986, UK</td>
<td>288 patients with acute abdominal pain</td>
<td>PRCT</td>
<td>Pain relief</td>
<td>Proportional to dosage</td>
<td>Not affected</td>
</tr>
<tr>
<td></td>
<td>Buprenorphine 200 µg v buprenorphine 400 µg v placebo</td>
<td></td>
<td>Clinical diagnosis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attard et al, 1992, UK</td>
<td>100 consecutive patients admitted to a surgical firm</td>
<td>PRCT</td>
<td>Pain score</td>
<td>Significantly better with papaveretum (p&lt;0.0001)</td>
<td>Papaveretum no longer used</td>
</tr>
<tr>
<td></td>
<td>Papaveretum 20 mg v normal saline</td>
<td></td>
<td>Tenderness score</td>
<td>Significantly better with papaveretum (p&lt;0.0001)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Incorrect diagnosis</td>
<td>2 after papaveretum v 9 after saline</td>
<td></td>
</tr>
<tr>
<td>Pace and Burke, 1996, USA</td>
<td>71 adult patients with acute, atraumatic abdominal pain in an emergency department</td>
<td>PRCT</td>
<td>Pain score</td>
<td>Significantly better with morphine (p&lt;0.001)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Morphine IV (35) v normal saline (36)</td>
<td></td>
<td>Accuracy of provisional diagnosis</td>
<td>No difference</td>
<td></td>
</tr>
<tr>
<td>LoVecchio et al, 1997, USA</td>
<td>48 patients with acute abdominal pain</td>
<td>PRCT</td>
<td>Change in physical examination</td>
<td>Significant changes in both morphine groups</td>
<td>Very small numbers</td>
</tr>
<tr>
<td></td>
<td>Morphine 10 mg v morphine 5 mg v placebo</td>
<td></td>
<td>Delay in diagnosis</td>
<td>No diagnostic delay in any group</td>
<td></td>
</tr>
<tr>
<td>Vermeulen et al, 1999, Switzerland</td>
<td>340 patients aged 16 years or more with suspected appendicitis</td>
<td>PRCT</td>
<td>Pain relief</td>
<td>Greater in morphine group</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Morphine IV (175) v placebo (165)</td>
<td></td>
<td>Sensitivity and specificity of ultrasound diagnoses</td>
<td>No significant difference</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Appropriateness of the decision to operate</td>
<td>No significant difference</td>
<td></td>
</tr>
</tbody>
</table>

PRCT = prospective randomised controlled trial.

---

**Search outcome**
Altogether 78 papers were found of which 73 were irrelevant or of insufficient quality for inclusion. The remaining five papers are shown in table 4.

**Comment**
All the studies show considerable benefit to the patient from pain relief with either no change in diagnostic accuracy or an improvement.

**Clinical bottom line**
Patients with acute, atraumatic abdominal pain should have analgesia administered without delay.


The BMA library supplied the papers.