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. Each BET has been constructed in the four stages that have been described elsewhere. The four topics covered in this issue of the journal are:

- Signs and symptoms of oesophageal coins
- Immobilisation of suspected scaphoid fractures
- Activated charcoal in tricyclic antidepressant overdose
- 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$.mp OR exp foreign bodies OR foreign body.mp OR foreign bodies.mp) AND (exp pediatrics OR pediatric$.mp OR paediatric$.mp OR child$.mp) AND (ingest$.mp OR swallow$.mp OR esophagus OR esophagus.mp OR esophag-
geal.mp OR oesophagus.mp OR oesophageal.mp) LIMIT to human AND english.

Search outcome
Altogether 435 papers were found of which 428 were irrelevant or of insufficient quality. The remaining seven papers are shown in table 1.

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.

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 a simple 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 fractures.mp) AND scaphoid$.mp] AND [exp casts, surgical OR cast$.mp OR plaster.mp OR exp splints OR splint$.mp OR exp immobilisation OR immobi-

isation.mp]) LIMIT to human AND english.

Search outcome
Altogether 131 papers were found of which 127 were irrelevant to the study question or of insufficient quality for inclusion. The remaining four papers are shown in table 2.

Comment
There is no direct evidence to answer the questions posed. The only prospective randomised controlled trial shows that patients return to work sooner if they are treated with a supportive bandage, but the follow up was too short to show any complications of this approach. It appears that the adverse event rate (fracture) is low (1%–5%) in the target population. In this subpopulation of fractures the adverse event rate (delayed union or non-union) is also low (10%–20%)—thus the overall long term complication rate for clinically suspected scaphoid fractures is tiny (0.1%–1%). None of the studies include enough patients to show any effect on this.

Clinical bottom line
There is no evidence to answer the question posed. Further work is needed in this area.


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 SU, Andersen JC, 1989, 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>
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<th>Study weaknesses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crome et al, 1977, UK*</td>
<td>Health volunteers given 75 mg nortriptyline, 10 g medicinal 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, UK*</td>
<td>48 patients with suspected TCA overdose. All had gastric lavage 10 g medicinal ± nothing</td>
<td>PRCT</td>
<td>Plasma TCA concentration</td>
<td>No difference in rate of fall noted</td>
<td>Small numbers with complications. Small charcoal dose. 18 patients excluded</td>
</tr>
<tr>
<td>Karkkainen and Neuvonin, 1986, Germany*</td>
<td>6 healthy volunteers. Each took 75 mg nortriptyline 50 g charcoal within 5 min</td>
<td>Experimental</td>
<td>Plasma TCA absorption</td>
<td>No significant difference Decreased by 99%</td>
<td>Small dose of TCA</td>
</tr>
<tr>
<td>Hulten et al, 1988, Multinational*</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>Unrealistic time to charcoal admin</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 tricyclic$.mp OR TCA$.mp OR exp desipramine OR exp nortriptyline OR desipramine OR amitriptyline) AND [exp charcoal OR charcoal.mp]) LIMIT to human AND english.

**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$.mp OR exp peritonitis OR peritonitis.mp] OR [exp pain OR pain$.mp] AND [abdom$.mp OR exp stomach OR stomach.mp OR tummy.mp]) AND [exp analgesia OR exp morphine OR exp analgesia, opioid OR analgesi$.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>
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<th>Outcomes</th>
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<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, Clinical diagnosis</td>
<td>Proportional to dosage, Not affected</td>
<td>Papaveretum no longer used</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, Tenderness score, Incorrect diagnosis</td>
<td>Significantly better with papaveretum (p&lt;0.0001), Significantly better with papaveretum (p&lt;0.0001)</td>
<td>Papaveretum no longer used</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, Incorrect diagnosis, Accuracy of provisional diagnosis</td>
<td>Significantly better with morphine (p&lt;0.001), No difference</td>
<td>Papaveretum no longer used</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, Delay in diagnosis</td>
<td>Significant changes in both morphine groups, No diagnostic delay in any group</td>
<td>Very small numbers</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, Sensitivity and specificity of ultrasound diagnoses, Appropriateness of the decision to operate</td>
<td>Greater in morphine group, No significant difference, No significant difference</td>
<td></td>
</tr>
</tbody>
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PRCT = prospective randomised controlled trial.

Search outcome

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Clinical bottom line

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The BMA library supplied the papers.

Immobilisation of suspected scaphoid fractures

Kathryn Gow and Rob Williams

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