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 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. Six BETs are included in this issue of the journal.

- Does nimodipine reduce mortality and secondary ischaemic events after subarachnoid haemorrhage?
- Aspiration of breast abscesses
- Metoclopramide versus placebo with opioid
- Safety of inferior vena cava filters as primary treatment for proximal deep vein thrombosis
- Screw tipped needles for intraosseous access
- Plaster or collar and cuff after reducing dislocated elbow?

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Does nimodipine reduce mortality and secondary ischaemic events after subarachnoid haemorrhage?

Report by G Brown, Specialist Registrar
Checked by S Carley, Consultant

Abstract
A short cut review was carried out to establish whether nimodipine is better than placebo at reducing mortality and neurological sequelae in patients with subarachnoid haemorrhage. Altogether 465 papers were found using the reported search, of which one 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 this best paper are tabulated. A clinical bottom line is stated.

Clinical scenario
A 24 year old man presents to the emergency department after a sudden headache and collapse. He presents with a GCS of 13 and a weakness of the left side. Computed tomography confirms a subarachnoid bleed. You refer him to the neurosurgeons who suggest giving him nimodipine to reduce cerebral vasospasm. You are too embarrassed to ask why.

Three part question
In [patients with proven subarachnoid haemorrhage] is [nimodipine better than placebo] at [resolving mortality and neurological sequelae]?

Search strategy

Search outcome
Altogether 465 papers found. One recent Cochrane systematic review identified. No relevant papers published after the date of the systematic review. The review was critically appraised (see table 1).

Comment(s)
SAH is a devastating illness. Treatment with calcium antagonists seems to offer a decrease in secondary ischaemic events in these patients. This is shown by the reduction in mortality and clinical findings. Although not specifically investigated in the BET, oral nimodipine appears to be the first choice of drug.

► CLINICAL BOTTOM LINE
Oral nimodipine is an important adjuvant treatment for SAH.


Aspiration of breast abscesses

Report by S Thirumalaikumar, Clinical Fellow
Checked by S Kommu, Senior House Officer

Abstract
A short cut review was carried out to establish whether needle aspiration was an alternative to incision and drainage in the management of breast abscess. Altogether 63 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 lactating woman attends the emergency department with a history of pain in the breast. The patient has been taking antibiotics prescribed by her general practitioner for two days without relief. On examination she has an abscess in her left breast. You wonder whether needle aspiration is an option or whether she needs formal incision and drainage.

Three part question
In [a patient with a breast abscess] is [needle aspiration as good as incision and drainage] in [achieving resolution and minimising recurrence]?

Search strategy
Medline 1966-01/04 using the OVID interface. [breast abscess$.mp OR {(exp breast OR breast$.mp) AND (exp abscess OR abscess$.mp)}] AND (aspiration.mp OR exp needles OR needle$.mp).

Search outcome
Altogether 63 papers were found, of which six were relevant to the question and of sufficient quality for inclusion (see table 2).

Comment(s)
There are no good studies to answer the question. Most of the studies involved small numbers and are uncontrolled descriptions of case series. In these series the smaller the abscess the better is the outcome and lower is the recurrence rate. Needle aspiration may be more effective when combined with antibiotics—but again there are no controlled studies to allow us to conclude this definitely. A randomised controlled trial is 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>Cochrane Stroke Group 2002 Netherlands</td>
<td>Papers selected from the Cochrane Stroke Group Trials Register (last searched November 2001), hand search of two Russian journals (1990-1995), contacted trialists and pharmaceutical companies to identify further studies</td>
<td>Systematic review and meta-analysis</td>
<td>Number of relevant papers (Ca antagonists and SAH)</td>
<td>11 papers with 2804 randomised patients</td>
<td>This is a well performed review article. Many of the data are pooled across four different types of Ca antagonists. However, the authors also show that the greatest benefit seems to be when nimodipine is used (as compared with the other Ca antagonists) and when it is given orally rather than IV.</td>
</tr>
</tbody>
</table>

Clinical bottom line
Needle aspiration may be an effective first treatment in small breast abscesses.


Metoclopramide versus placebo with opioid

Report by W Alsalim, Specialist Registrar
Checked by W C Leung, Lecturer, John Butler, Consultant

Abstract
A short cut review was carried out to establish whether metoclopramide reduced nausea and vomiting after the administration of morphine. Altogether 405 papers were found using the reported search, of which one 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 this best paper are tabulated. A clinical bottom line is stated.

Clinical scenario
A 32 year old man attends the emergency department having been kicked on his right leg by a horse. He is complaining of severe pain in the leg and examination shows deformity. You make the clinical diagnosis of a fracture. You ask for an opioid to relieve his pain; the nurses insist you give metoclopramide as well. You wonder whether there is any evidence to support their assertion that metoclopramide should be given routinely with opioids.
The incidence of nausea and vomiting with opioid is very low in these groups of patients. This study did not provide evidence that prophylactic metoclopramide is effective.


Three part question
In [patients treated with opioids] is [metoclopramide better than nothing] in [reducing nausea and vomiting]?

Search strategy
MEDLINE 1966-01/04 using the Ovid interface. [(exp vomiting OR exp Nausea OR vomit$OR exp Vomiting, anticipatory OR exp emesis$ OR nausea$) AND (exp metoclopramide OR metoclopramide$) AND (randomised controlled trial.mp OR exp clinical trials OR exp random allocation OR exp randomized controlled trials OR double-blind trial.mp OR exp double-blind method OR exp clinical trials) LIMIT to human AND English.

Search outcome
Altogether 405 papers were found of which one is relevant and of sufficient quality for inclusion (see table 3).

Comment(s)
While many studies evaluated the effects of metoclopramide postoperatively, only this one evaluated the effects in the emergency department. Because of the low incidence of nausea and vomiting in both groups of this study, it is not possible to make a specific conclusion regarding the prophylactic effect of metoclopramide in reducing opioid associated nausea and vomiting.

► CLINICAL BOTTOM LINE
The incidence of nausea and vomiting with opioid is very low in these groups of patients. This study did not provide evidence that prophylactic metoclopramide is effective.

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>Dixon JM, 1992, UK</td>
<td>18 consecutive patients with non-lactational breast abscesses aspiration (10) vs local anaesthetic drainage (7) or both (1)</td>
<td>Clinical trial</td>
<td>Clinical course</td>
<td>All abscesses resolved within 2 weeks</td>
<td>Not randomised, small study</td>
</tr>
<tr>
<td>Tan SM and Low SC, 1998, Singapore</td>
<td>21 consecutive patients with breast abscesses</td>
<td>Prospective case series</td>
<td>Clinical course</td>
<td>19 patients successfully treated by needle aspiration</td>
<td>No control, Small study</td>
</tr>
<tr>
<td>Hook GW and Ikedo DM, 1999, USA</td>
<td>13 patients undergoing ultrasonically guided breast abscess aspiration</td>
<td>Case series</td>
<td>Recurrences</td>
<td>8 abscesses resolved completely after aspiration</td>
<td>No control, Very small study</td>
</tr>
<tr>
<td>Schwarz RJ and Shrestha R, 2001, USA</td>
<td>30 patients with 33 breast abscesses treated by needle aspiration</td>
<td>Prospective case series</td>
<td>Clinical course</td>
<td>18 cases require only single aspiration, 9 cases required multiple aspirations, 6 cases required incision and drainage</td>
<td>No control, Small study</td>
</tr>
<tr>
<td>Imperiale A, et al, 2001, Italy</td>
<td>26 patients with 28 abscesses undergoing ultrasound guided fine needle aspiration and antibiotic injection</td>
<td>Case series</td>
<td>Clinical course (serial ultrasonography)</td>
<td>27 abscesses resolved over 7 weeks. One required surgical drainage</td>
<td>No control, Small study</td>
</tr>
<tr>
<td>Leborgne F and Leborgne F, 2003, Uruguay</td>
<td>73 patients with breast abscesses undergoing sonographically guided aspiration and antibiotic instillation</td>
<td>Case series</td>
<td>Clinical course</td>
<td>38 cases cured after a single aspiration, 18 cured after 2 aspirations and 8 cured after multiple aspirations Surgical rescue required in 3 cases and 6 patients refused a second aspiration</td>
<td>No control</td>
</tr>
</tbody>
</table>

Safety of inferior vena cava filters as primary treatment for proximal deep vein thrombosis

Report by Debbie Dawson, Clinical Research Nurse
Checked by Kerstin Hogg, Clinical Research Fellow

Abstract
A short cut review was carried out to establish whether inferior vena cava filters were better than standard anticoagulation therapy in reducing pulmonary emboli in patients with proximal vein lower limb DVTs. Altogether 463 papers were found using the reported search, of which one 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 this best paper are tabulated. A clinical bottom line is stated.

Clinical scenario
A 40 year old man attends the emergency department with a one week history of a painful, swollen right leg. An iliofemoral deep vein thrombosis is diagnosed. He has no previous history of venous thromboembolism, however, his father has a history of PE. You decide to give him standard anticoagulation therapy. A passing physician states that in the patient is at high risk for developing a PE, and suggests referral for insertion of an inferior vena cava filter. You wonder if there is any evidence to support this assertion.

Three part question
In [patients with proximal lower limb DVT] are [inferior vena cava filters better than standard anticoagulation therapy] at...
[reducing pulmonary embolisation and minimising recurrence of DVT]?  

Search strategy
Medline 1966-01/04 using the Ovid interface. [exp venous thrombosis/OR deep vein thrombosis.mp OR DVT.mp OR exp deep vein thrombosis OR deep venous thrombo.mp] AND [exp vena cava filters/OR inferior vena cava filters.mp OR IVC$.mp] LIMIT to human and English.

Search outcome
Altogether 463 papers were found of which one was a PRCT relevant to the question (see table 4).

Comment(s)
The authors conclude that any initial beneficial effects of the filter group were counter balanced by the increased rate of recurrent DVT, without any significant difference in mortality. There is only one RCT to be found in the literature addressing this question, while there is an abundance of literature supporting the use of anticoagulants as effective treatment for proximal DVT.

▷ CLINICAL BOTTOM LINE
Standard anticoagulants are the first treatment of choice for someone with a proximal DVT who has no contraindications to the treatment.

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### 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>Talbot-Stern J and Paoloni R, 2000, Australia</td>
<td>122 patients which 63 were given metoclopramide</td>
<td>PRCT, double blind</td>
<td>At 30 min At 60 min</td>
<td>No significant difference</td>
<td>Small study</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Nausea at 30 min and 60 min</td>
<td>Metoclopramide 3.2% v placebo 6.8% at 30 min Metoclopramide 4.8% v placebo 3.4% at 60 min</td>
<td>Numbers did not add up</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Vomiting at 30 min and 60 min</td>
<td>Metoclopramide 0% v placebo 0% at 30 min. Metoclopramide 0% v placebo 1.7% at 60 min</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>Side effect</td>
<td>Metoclopramide 7.9% v placebo 3.4%</td>
<td></td>
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</tbody>
</table>

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### 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>Decousus H, et al, 1998, France</td>
<td>400 patients with proximal vein thrombosis. 200 randomised to receive an IVCF and 200 to receive no IVCF. Patients also randomised to receive LMWH or unfractionated heparin. Follow up data recorded day 12 and two years</td>
<td>PRCT (two by two factorial design) Multicentre (44 sites)</td>
<td>Rate of recurrent VTE at 12 days: filter group/ no filter group</td>
<td>2 (1.1%) had had symptomatic or asymptomatic PE/9 (4.8%) had had symptomatic or asymptomatic PE/6 (3.4%) had symptomatic PE/12 (6.3%) had symptomatic PE</td>
<td>Overall 6 patients died of PE, no breakdown in the paper of filter compared with no filter</td>
</tr>
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<td></td>
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<td>Recurrent VTE at two years: filter group/ no filter group</td>
<td>37 (20.8%) at 2y had had recurrent DVT (95% CI, p = 0.03). (16 had thrombosis at the filter site)/21 (11.6%) at 2y had had recurrent DVT</td>
<td>The study was powered for 400 patients per group (800), however a steering committee interrupted the study because of slow recruitment rate</td>
</tr>
<tr>
<td></td>
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<td>Death at 12 days: filter group/no filter group</td>
<td>5 (2.5%), no PE/5 (2.5%), 4 PE</td>
<td></td>
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<td></td>
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<td></td>
<td>Death at two years: filter group/no filter group</td>
<td>43 (21.6%)/40 (20.1%)</td>
<td></td>
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<td></td>
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<td></td>
<td>Major bleeding: filter group/no filter group</td>
<td>17 (8.8%)/22 (11.8%)/16 (8.5%)/23 (12%)</td>
<td></td>
</tr>
</tbody>
</table>

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### Screw tipped needles for intrasosseous access

Report by Simon Carley, Consultant  
Checked by Russel Boyd, Consultant

**Abstract**
A short cut review was carried out to establish whether screw tipped intrasosseous needles were better than standard intrasosseous needles. Altogether 35 papers were found using the reported search, of which one 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 this best paper are tabulated. A clinical bottom line is stated.

**Clinical scenario**
A 50 year old alcoholic man presents to the emergency department by ambulance. He is known to have been fitting for the past 20 minutes. He has a SaO₂ of 90% on oxygen mask and tolerates an oral airway. You are unable to obtain
IV access and his vigorous movements will make central venous access difficult and possibly dangerous. You decide to place an intraosseous needle in the sternum. You use your standard IO needle but struggle to get through the bone cortex. Your consultant suggests buying some screw tipped cannula to aid insertion. You wonder if they would be any better.

Three part question
In [patients requiring IO access] is a screwed tipped IO needle better than a standard needle at [rapidly easing insertion and ensuring correct placement]?

Search strategy
Medline 1966-01/04 using the Ovid interface. [exp Infusions, intraosseous OR IO.mp. OR intraosseous.mp.] AND [screw.mp.]

Search outcome
Altogether 35 papers were found of which one was relevant to the three part question (see table 5).

Comment(s)
A previous study by the above authors showed no benefit for standard IO needles compared with standard bone marrow needles for IO access. In clinical practice IO infusion is a comparatively rare event, often performed by junior staff with little prior experience of the procedure, the levels of training/experience used in this study are probably realistic. The time differences for insertion are not clinically important. The ease of insertion scores are important as these are important in successful placement of the IO needle. The study shows an improvement in successful placement of the screw tipped needle once the students had practised the technique. The authors conclude that there is no benefit to screw tip needles. We believe that the potential improvement in successful placement with little difference in time to successful placement is clinically important.

Table 5

<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>Jun H, et al, 2000, USA</td>
<td>Medical students received instruction on use of screw tip IO, or normal bone marrow aspiration needle. They were then tested on simulated IO infusion on ribs and turkey thighs. Two attempts, one after demo, one practised.</td>
<td>Randomised experimental study. 42 medical students were randomised as to which needle they used first</td>
<td>First attempt (written instruction and demo) Time to placement</td>
<td>Less for standard (33s v 54s p = 0.19)</td>
<td>Experimental model was bone only (rather than bone plus flesh)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Ease of insertion (10 point VAS)</td>
<td>Less for standard (3.2 v 6.3 p &lt; 0.001)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Success rate</td>
<td>83% for standard v 76% for screw tip p = NS</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Second attempt (practised) Time to placement</td>
<td>Less for screw tip (32s v 27s p = NS)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Ease of insertion (10 point VAS)</td>
<td>Less for standard (2.5 v 5 p &lt; 0.001)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Success rate</td>
<td>79% for standard v 95% for screw tip. p &lt; 0.05</td>
</tr>
</tbody>
</table>

CLINICAL BOTTOM LINE
Screw tip IO needles are more difficult to insert but have a higher success rate.


Plaster or collar and cuff after reducing dislocated elbow

Report by Katherine Potier, Specialist Registrar
Checked by Simon Carley, Consultant Registrar
Abstract
A short cut review was carried out to establish whether an above elbow plaster cast was better than a collar and cuff after reduction of a dislocated elbow. No papers addressing this question were found using the reported search.

Clinical scenario
A 24 year old woman presents to the emergency department after a fall on her left arm. Clinical and radiological examination reveals a posterior dislocation of the elbow joint. You reduce this in the department using propofol for sedation. You wonder what form of immobilisation should be used. In the past you have used a collar and cuff but your SHO (who has just done orthopaedics) states that the patients should have an above elbow plaster cast.

Three part question
In [an adult who has had a dislocated elbow reduced] is [collar and cuff or an above elbow plaster] better at [reducing pain, recurrence and post-reduction complication]?

Search strategy
Search outcome
Altogether 89 papers of which none were relevant to the original question.

Comment(s)
This is a real life scenario. Our current practice is to initially immobilise using a collar and cuff with or without a wool and crepe bandage. In the absence of fracture or significant ligamental rupture, the biomechanics of the elbow should result in stability once reduced.

► CLINICAL BOTTOM LINE
There is no published evidence. Local advice (collar and cuff in our case) should be followed.
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K Mackway-Jones

doi: 10.1136/emj.2004.014902

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