

BEST EVIDENCE TOPIC REPORTS

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

Edited by K Mackway-Jones

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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 Infirmary¹ or placed on the BestBETs website. Each BET has been constructed in the four stages that have been described elsewhere.² The BETs shown here together with those published previously and those currently under construction can be seen at <http://www.bestbets.org>.³ 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?

K Mackway-Jones, Department of Emergency Medicine, Manchester Royal Infirmary, Oxford Road, Manchester M13 9WL, UK; kevin.mackway-jones@man.ac.uk

1 Carley SD, Mackway-Jones K, Jones A, *et al*. Moving towards evidence based emergency medicine: use of a structured critical appraisal journal club. *J Accid Emerg Med* 1998;15:220–2.

2 Mackway-Jones K, Carley SD, Morton RJ, *et al*. The best evidence topic report: a modified CAT for summarising the available evidence in emergency medicine. *J Accid Emerg Med* 1998;15:222–6.

3 Mackway-Jones K, Carley SD. [bestbets.org](http://www.bestbets.org): Odds on favourite for evidence in emergency medicine reaches the worldwide web. *J Accid Emerg Med* 2000;17:235–6.

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

Medline 1966-01/04 using the Ovid interface. [subarachnoid.mp OR exp subarachnoid hemorrhage] AND [nimodipine.mp OR exp nimodipine] Limit to human, English AND abstracts.

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.

Rinkel GJE, Feigin VL, Algra A, *et al*. Calcium antagonists for aneurysmal subarachnoid haemorrhage. *Cochrane Library*. Issue 4. Oxford: Update Software, 2002.

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

Table 1

Author, date and country	Patient group	Study type (level of evidence)	Outcomes	Key results	Study weaknesses
Cochrane Stroke Group 2002 Netherlands	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	Systematic review and meta-analysis	Number of relevant papers (Ca antagonists and SAH) Number of papers specific to nimodipine Effect on poor outcome Ca antagonist v placebo Effect on fatality Clinical signs of secondary ischaemic neurological deficit CT evidence of secondary ischaemia Rebleeding after SAH	11 papers with 2804 randomised patients 8 trials with 1574 randomised patients RR of 0.82 (0.72 to 0.93) in favour of Ca antagonists RR of 0.89 (0.75 to 1.06) in favour of Ca antagonists RR of 0.67 (0.59 to 0.76) in favour of Ca antagonists RR of 0.80 (0.71 to 0.89) in favour of Ca antagonists RR of 0.77 (0.58 to 1.02) in favour of Ca antagonists	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.

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.

► CLINICAL BOTTOM LINE

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

Dixon JM. Outpatient treatment of non-lactational breast abscesses. *Br J Surg* 1992;**79**:56–7.

Tan SM, Low SC. Non-operative treatment of breast abscesses. *Aust N Z J Surg* 1998;**68**:423–4.

Hook GW, Ikeda DM. Treatment of breast abscesses with US-guided percutaneous needle drainage without indwelling catheter placement. *Radiology* 1999;**213**:579–82.

Schwarz RJ, Shrestha R. Needle aspiration of breast abscesses. *Am J Surg* 2001;**182**:117–19.

Imperale A, Zandrino F, Calabrese M, et al. Abscesses of the breast. US-guided serial percutaneous aspiration and local antibiotic therapy after unsuccessful systemic antibiotics. *Acta Radiol* 2001;**42**:161–5.

Leborgne F, Leborgne F. Treatment of breast abscesses with sonographically guided aspiration, irrigation and instillation of antibiotics. *AJR Am J Roentgenol* 2003;**181**:1089–91.

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 52 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.

Table 2

Author, date and country	Patient group	Study type (level of evidence)	Outcomes	Key results	Study weaknesses
Dixon JM, 1992, UK	18 consecutive patients with non-lactational breast abscesses Aspiration (10) v local anaesthetic drainage (7) or both (1)	Clinical trial	Clinical course Patient satisfaction	All abscesses resolved within 2 weeks All patients expressed satisfaction	Not randomised, small study
Tan SM and Low SC, 1998, Singapore	21 consecutive patients with breast abscess	Prospective case series	Clinical course Recurrences	19 patients successfully treated by needle aspiration 3	No control. Small study
Hook GW and Ikeda DM, 1999, USA	13 patients undergoing ultrasonically guided breast abscess aspiration	Case series	Clinical course	8 abscesses resolved completely after aspiration. 5 were referred for surgical management	No control. Very small study
Schwarz RJ and Shrestha R, 2001, USA	30 patients with 33 breast abscesses treated by needle aspiration	Prospective case series	Clinical course	18 cases require only single aspiration. 9 cases required multiple aspirations, 6 cases required incision and drainage	No control. Small study
Imperiale A, et al, 2001, Italy	26 patients with 28 abscesses undergoing ultrasound guided fine needle aspiration and antibiotic injection	Case series	Clinical course (serial ultrasonography)	27 abscesses resolved over 7 weeks. One required surgical drainage	No control. Small study
Leborgne F and Leborgne F, 2003, Uruguay	73 patients with breast abscesses undergoing sonographically guided aspiration and antibiotic instillation	Case series	Clinical course	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	No control

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\$.mp OR exp Vomiting, anticipatory OR emesis\$.mp OR nausea\$.mp) AND (exp metoclopramide OR metoclopramide\$.mp) 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.

Talbot-Stern J, Paoloni R. Prophylactic metoclopramide is unnecessary with intravenous analgesia in the ED. *Am J Emerg Med* 2000;18:653-7.

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 40year old man attends the emergency department with a one week history of a painful, swollen right leg. An ilio-femoral 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 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

Table 3

Author, date and country	Patient group	Study type (level of evidence)	Outcomes	Key results	Study weaknesses
Talbot-Stern J and Paoloni R, 2000, Australia	122 patients which 63 were given metoclopramide	PRCT, double blind	At 30 min At 60 min Nausea at 30 min and 60 min Vomiting at 30 min and 60 min Side effect	No significant difference Metoclopramide 3.2% v placebo 6.8% at 30 min Metoclopramide 4.8% v placebo 3.4% at 60 min Metoclopramide 0% v placebo 0% at 30 min. Metoclopramide 0% v placebo 1.7% at 60 min Metoclopramide 7.9% v placebo 3.4%	Small study Numbers did not add up

[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.

Decousus H, Leizorovicz A, Parent F, et al. A clinical trial of vena caval filters in the prevention of pulmonary embolism in patients with proximal deep-vein thrombosis. Prevention du Risque d'Embolie Pulmonaire par Interruption Cave Study Group. *N Engl J Med* 1998;338:409-15.

Screw tipped needles for intraosseous access

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

Abstract

A short cut review was carried out to establish whether screw tipped intraosseous needles were better than standard intraosseous 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

Table 4

Author, date and country	Patient group	Study type (level of evidence)	Outcomes	Key results	Study weaknesses
Decousus H, et al, 1998, France	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	PRCT (two by two factorial design) Multicentre (44 sites)	Rate of recurrent VTE at 12 days: filter group/ no filter group Recurrent VTE at two years: filter group/ no filter group Death at 12 days: filter group/no filter group Death at two years: filter group/no filter group Major bleeding: filter group/no filter group/ LMWH/UFH	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 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 5 (2.5%), no PE/5 (2.5%), 4 PE 43 (21.6%)/40 (20.1%) 17 (8.8%)/22 (11.8%)/16 (8.5%)/ 23 (12%)	Overall 6 patients died of PE, no breakdown in the paper of filter compared with no filter The study was powered for 400 patients per group (800), however a steering committee interrupted the study because of slow recruitment rate

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 screw 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 and show a clear benefit for the standard needle, however the most important clinical outcome is 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.

► CLINICAL BOTTOM LINE

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

Jun H, Haruyama AZ, Chang KS, *et al.* Comparison of a new screw tipped intraosseous needle versus a standard bone marrow aspiration needle for infusion. *Am J Emerg Med* 2000;18:135-9.

Plaster or collar and cuff after reducing dislocated elbow

Report by Katherine Potier, *Specialist Registrar*
Checked by Simon Carley, *Consultant*

Abstract

A short cut review was carried out to establish whether an above elbow plaster cast was better than a collar and cuff sling 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

Medline 1966-01/04 using the Ovid interface. [exp elbow joint OR elbow.mp. OR exp elbow] AND [dislocation.mp. OR exp dislocations OR dislocat\$.mp.] AND [exp Immobilization/OR immobilisation.mp. OR (collar and cuff).mp. OR exp Casts, Surgical/OR plaster.mp OR plaster of paris.mp.] LIMIT human AND English language.

Table 5

Author, date and country	Patient group	Study type (level of evidence)	Outcomes	Key results	Study weaknesses
Jun H, <i>et al</i> , 2000, USA	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.	Randomised experimental study. 42 medical students were randomised as to which needle they used first	First attempt (written instruction and demo) Time to placement Ease of insertion (10 point VAS) Success rate Second attempt (practised) Time to placement Ease of insertion (10 point VAS) Success rate	Less for standard (33 s v 54 s p=0.19) Less for standard (3.2 v 6.3 p<0.001) 83% for standard v 76% for screw tip p=NS Less for screw tip (32 s v 27 s p=NS) Less for standard (2.5 v 5 p<0.001) 79% for standard v 95% for screw tip. p<0.05	Experimental model was bone only (rather than bone plus flesh) Poor model for "adult" bone Difficult to know whether skills will degrade to "unpractised" level with time Comparison was against "standard bone marrow" needle rather than "standard IO needle"

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 ligament 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.