

## 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. 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<sup>1</sup> or placed on the BestBETs website. Each BET has been constructed in the four stages that have been described elsewhere.<sup>2</sup> The BETs shown here together with those published previously and those currently under construction can be seen at <http://www.bestbets.org>.<sup>3</sup> Four BETs are included in this issue of the journal.

- ▶ Fasting before prilocaine Biers' block
- ▶ Ultrasound in the diagnosis of testicular torsion
- ▶ Primary split skin grafts for pretibial lacerations
- ▶ Serial x rays in battery ingestion

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## Fasting before prilocaine Biers' block

Report by Muhammad Ahmad, *Consultant in Emergency Medicine*

Checked by Gary Saynor, *Consultant in Emergency Medicine*

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### Abstract

A short cut review was carried out to establish whether a period of fasting increases the safety of Biers' block (intravenous regional anaesthesia). A total of 50 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 75 year old man presents to the emergency department with a wrist injury. X ray reveals a Colles' fracture with dorsal angulation requiring manipulation. The patient has had lunch one hour before presentation. Your colleague tells you that you should manipulate the fracture before your shift ends in an hour's time, but a passing anaesthetist says that you should wait at least five hours (six hours after food) before you do anything. The departmental manager points out that this means the patient should be admitted since they will "breach" the target time of four hours if you wait. If the patient is admitted the next available trauma list is in 36 hours. You wonder whether the patient should be fasted for four to six hours or if it is safe to reduce this fracture under Bier's block without any period of fasting.

### Three part question

In [patients with uncomplicated Colles' fracture] is [fasting before prilocaine Biers' block] necessary for [the prevention of life threatening complications]?

### Search strategy

Medline 1966–week 3 March 2005 and Embase 1980–week 13 2005 using the OVID interface, and *Cochrane Library* Issue 1 2005. Medline: [(biers adj block.mp. OR exp nerve block/OR exp anesthesia, local/OR exp anesthesia, conduction/)] AND [(exp fasting/OR fasting.mp.)] Limit to Human and English. A total of 40 papers found. Embase: [biers adj block.mp. OR exp nerve block/OR exp regional anesthesia/OR exp intravenous anesthesia/] AND [ exp dietary restriction/OR exp food deprivation/OR fasting.mp.] Limit to Human and English. A total of 28 papers found. *Cochrane Library*: "biers block" [all fields] OR Colles' Fracture (Mesh) AND Fasting (Mesh). A total of 32 articles found.

### Search outcome

Overall 50 papers were found, of which 47 were not relevant to the study question. All the references in the relevant papers were searched and two more papers were found. Four papers are included in table 1.

### Comment(s)

The evidence found does not address the question directly and is limited to postal surveys. All studies showed that major complications are extremely rare in both groups and, where the question was addressed, there is no evidence of increased rate of complications in patients who were not fasted.

Table 1

Author, date, and country	Patient group	Study type	Outcomes	Key results	Study weaknesses
Bartholomew K and Sloan JP, 1990, UK	Patients with Colles' fracture reduced under Biers' block	Questionnaire survey to 106 emergency departments	Serious complications	No serious or fatal complications	
Lowen R and Taylor J, 1994, Australia	Patients with Colles' fracture reduced under Biers' block	Questionnaire survey to 120 emergency departments 97% response rate	Complications Departments that fast their patients	Convulsions—2 35%	
Kendall JM <i>et al</i> , 1995, UK	Patients with Colles' reduced under Biers' block	Postal survey to 150 emergency departments. 58% response	Complications	No significant adverse effect	Poor response
O'Sullivan I <i>et al</i> , 1996, UK	Patients with Colles' fracture who were treated under Biers' block	Questionnaire survey to 282 emergency departments 77% response	Complications in fasted and unfasted patients	No difference	

### ► CLINICAL BOTTOM LINE

The limited evidence available suggests there is no need to fast patients prior to Biers' block. Further research is required.

**Bartholomew K, Sloan JP.** Prilocaine for Biers' block; how safe is safe? *Arch Emerg Med* 1990;7:189–95.

**Lowen R, Taylor J.** Biers' block—the experience of Australian emergency departments. *Med J Aust* 1994;160:108–11.

**Kendall JM, Allen PE, McCabe SE.** A tide of change in the management of an old fracture. *J Accid Emerg Med* 1995;12:187–8.

**O'Sullivan I, Brooks S, Maryosh J.** Is fasting necessary before prilocaine Biers' block? *J Accid Emerg Med* 1996;13:105–7.

## Ultrasound in the diagnosis of testicular torsion

Report by Zain Kapasi, Senior House Officer in Emergency Medicine

Checked by Steve Halliday, Senior House Officer in Emergency Medicine

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### Abstract

A short cut review was carried out to establish whether colour Doppler ultrasound is more sensitive than clinical examination in ruling out testicular torsion. A total of 284 papers were found using the reported search, of which seven 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 15 year old boy presents to the emergency department with gradual onset testicular pain which has been present for the last six hours. On examination he has marked tenderness on the left side with normally placed testicles. There is a moderate left sided swelling and mild erythema, and he describes some recent dysuria. You wonder if colour Doppler ultrasound can help you to accurately rule out torsion and thus prevent this boy going for surgery unnecessarily?

### Three part question

[In patients with testicular pain] is [ultrasound better than clinical examination] at [ruling out testicular torsion]?

### Search strategy

Medline 1966–March week 4 2005, Embase 1980–week 13 2005, and *Cochrane Library* Issue 1 2005. Medline: (exp spermatic cord torsion/OR testi\$ adj torsion.mp) OR (exp testis/AND torsion.mp). AND (exp ultrasonography/OR ultraso\$.mp.). Limit to Human and English Language. A total of 223 articles found. Embase: [(exp testis torsion/OR testi\$ adj torsion.mp.)] AND [(exp echography/OR exp Doppler Flowmetry/or exp Doppler Echography/or exp Color Ultrasound Flowmetry/OR ultraso\$.mp.)] Limit to Human and English Language. A total of 284 papers found. *Cochrane Library*: [torsion (mesh this term only) AND testis (mesh explode) OR spermatic cord torsion (mesh explode)] AND (ultrasonography (mesh explode)). Four articles found.

### Search outcome

Overall 284 papers were found, of which seven were relevant and of sufficient quality for inclusion (see table 2).

### Comment(s)

Some of the studies that were found are over 10 years old and the technology available for ultrasound has changed considerably since that time. New ultrasound techniques that attempt to identify a twisted cord as opposed to blood flow to the testicle appear promising. The results presented do not suggest that ultrasonography alone can rule out testicular torsion. It may be that it can perform this function in cases with low or even moderate clinical suspicion—but this question has not been addressed.

### ► CLINICAL BOTTOM LINE

Ultrasound examination is a useful addition to clinical examination and experience but should not overrule clinical suspicion.

**Dewire DM, Begun FP, Lawson RK, et al.** Color Doppler ultrasonography in the evaluation of the acute scrotum. *J Urol* 1992;147:89–91.

**Schwaibold H, Fobbe F, Klan R, et al.** Evaluation of acute scrotal pain by color-coded duplex sonography. *Urol Int* 1996;56:96–9.

**Hendrikx AJ, Dang CL, Vroegindewij D, et al.** B-mode and colour-flow duplex ultrasonography: a useful adjunct in diagnosing scrotal diseases? *Br J Urol* 1997;79:58–65.

Table 2

Author, date, and country	Patient group	Study type	Outcomes	Key results	Study weaknesses
Dewire DM <i>et al</i> , 1992, USA	20 patients separated clinically into 3 groups (trauma, inflammation, ischaemia)	Diagnostic cohort	Correct diagnosis of torsion	Correctly predicted the need for surgery in 89%	Small study numbers Data 12 years old
Schwaibold H <i>et al</i> , 1996, Germany	31 patients with painful scrotums	Diagnostic cohort	Correct diagnosis of testicular torsion	Definitive diagnosis in 83%	Results from 1988 to 1991
Hendriks AJ <i>et al</i> , 1997, Netherlands	215 patients with scrotal complaints	Diagnostic cohort	38% of torsions missed	Clinical examination 7.6%; ultrasound 7.6%	No direct comparison of clinical v ultrasound
Baker LA <i>et al</i> , 2000, USA	130 patients with equivocal clinical suspicion of torsion	Diagnostic cohort	Correct diagnosis of torsion by ultrasound	Sensitivity 88.9%, specificity 98.8%	No direct comparison of clinical v ultrasound
Kravchick S <i>et al</i> , 2001, Israel	38 boys with scrotal pain and borderline clinical findings	Diagnostic cohort	Correct diagnosis of torsion	Ultrasound 88.9% sensitive, 90% specific; clinical assessment 47.4% accuracy	No sensitivity or specificity for clinical assessment
Yuan Z <i>et al</i> , 2001, China	17 pre-op acute scrotums, 17 normal scrotums	Diagnostic cohort	Correct diagnosis of testicular torsion	48% accuracy at torsion pick-up	Small study numbers No direct comparison of clinical v ultrasound
Stehr M and Boehm R, 2003, Germany	132 children with acute scrotum	Diagnostic cohort	% of torsions reported normal by ultrasound in a group with clinically suspected torsion	3.8%	Indirect comparison of clinical examination and ultrasound

**Baker LA**, Sigman D, Mathews RI, *et al*. An analysis of clinical outcomes using colour doppler testicular ultrasound for testicular torsion. *Pediatrics* Mar 2000;**105**(3 Pt 1):604–7.

**Kravchick S**, Cytron S, Leibovici O, *et al*. Color Doppler sonography: its real role in the evaluation of children with highly suspected testicular torsion. *Eur Radiol* 2001;**11**:1000–5.

**Yuan Z**, Luo Q, Chen L, *et al*. Clinical study of scrotum scintigraphy in 49 patients with acute scrotal pain: a comparison with ultrasonography. *Ann Nucl Med* 2001;**15**:225–9.

**Stehr M**, Boehm R. Critical validation of colour Doppler ultrasound in diagnostics of acute scrotum in children. *Eur J Pediatr Surg* 2003;**13**:386–92.

## Primary split skin grafts for pretibial lacerations

Report by Sunil Dasan, *Specialist Registrar*  
Checked by Kambiz Hashemi, *Consultant*  
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### Abstract

A short cut review was carried out to establish whether primary split skin grafting is better than simple wound edge approximation at reducing time to healing in patients with pretibial flap lacerations. A total of 72 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 69 year old woman has slipped and caught her leg on a chair. She attends your emergency department with a large flap laceration to the anterior aspect of her right leg. She has no other injuries, no other significant past medical history, and has good social support. You want her wound to heal quickly so that she may get back to her normal activities as soon as possible. You wonder whether a primary split skin

graft or a simpler procedure using the existing flap would be best to achieve this.

### Three part question

In [patients with pretibial flap lacerations] is [a primary skin graft better than simple wound edge approximation] at [reducing the time to healing]?

### Search strategy

Medline 1966–week 4 March 2005, Embase 1980–week 13 2005, and *Cochrane Library* Issue 1 2005. Medline: [pretibia\$.mp OR pretibia\$.mp] AND [exp wounds and injuries/OR lacerat\$.mp. OR injur\$.mp OR exp skin flaps/OR exp skin transplantation] limit to human and English language. A total of 64 articles found. Embase: [pre-tibia\$.mp. OR pretibia\$.mp.] AND [exp injury/OR lacerat\$.mp OR exp skin transplantation/or exp skin graft/or skin flap/] limit to human and English language. A total of 54 articles found. *Cochrane Library*: Pretibial [all fields]. A total of 23 records found.

### Search outcome

A total of 72 papers were found of which only one was relevant and of sufficient quality for inclusion (see table 3).

### Comment(s)

Earlier studies only compared primary split skin grafting with grafting after failed conservative management or studied conservative management alone. This study shows that primary split skin grafting under local anaesthetic shortens the time to full healing of pretibial flap lacerations by nearly four weeks though a larger prospective randomised controlled trial would be needed to confirm this. Early mobilisation has been shown to be beneficial in the elderly after such a procedure which makes management as an outpatient the preferred option.

Table 3

Author, date, and country	Patient group	Study type	Outcomes	Key results	Study weaknesses
Haiart DC <i>et al</i> , 1990, UK	25 patients with pretibial lacerations Primary excision under local anaesthetic and split skin graft versus defatting of flap and steristrips	Prospective randomised controlled trial	Proportion of defect not covered at 10 days Further operative treatment Duration of hospitalisation Time to complete healing	0% v 26.9% 0 v 4 patients 11.0 v 16.1 days 13.2 v 40.7 days	Small numbers No independent assessment of wounds

### ► CLINICAL BOTTOM LINE

A primary split skin graft performed under local anaesthetic significantly reduces the healing time for pretibial flap lacerations and can be done successfully as an outpatient procedure.

Haiart DC, Paul AB Chalmers R, *et al*. Pretibial lacerations: a comparison of primary excision and grafting with "defatting" the flap. *Br J Plast Surg* 1990;43:312-14.

## Serial x rays in battery ingestion

Report by Stewart Teece, *Specialist Registrar*  
Checked by Kevin Mackway-Jones, *Professor*  
doi: 10.1136/emj.2005.027516

### Abstract

A short cut review was carried out to establish whether serial x rays were necessary in cases of battery ingestion where the battery has passed through the oesophagus. A total of 104 papers were found using the reported search, of which none presented any evidence to answer the clinical question. It is concluded that there is no evidence available to answer this question. Further research is needed.

### Clinical scenario

A mother brings her 3 year old to the department, concerned that she has swallowed a battery. X ray reveals a metallic opacity in the abdomen which could very likely be a battery. You reassure the mother but she is concerned about the passage of the battery and wants to come back for a repeat film. You wonder whether you should perhaps make sure that it's passing distally to prevent it decaying inside the body.

### Three part question

In [children who have swallowed batteries] do [serial abdominal x rays] reduce the [incidence of perforation and need for later intervention]?

### Search strategy

Medline 1966–April week 4 2005 and Embase 1980–week 19 2005 using the OVID interface. Medline: [Battery.mp OR batteries.mp] AND [ingestion.mp OR swallow\$.mp OR eat\$.mp] AND {perforat\$.mp OR corrode.mp OR exp corrosion OR corrosion.mp}. A total of 28 papers found. Embase: [exp electric battery OR battery.mp OR batteries.mp] AND [ingestion.mp OR exp ingestion OR exp swallowing OR swallow\$.mp OR eat\$.mp] AND exp duodenal perforation OR exp perforation OR perforate\$.mp OR corrode\$.mp OR exp corrosion OR corrosion.mp]. A total of 21 papers found.

### Search outcome

Overall 29 papers found, of which none contained any data to answer the question posed.

### Comment(s)

A number of authors expressed a personal view that serial x rays were necessary to ensure that the battery had been passed, but none offered any direct evidence for this. Other authors felt that "nature should be allowed to take its course", but again none offered supporting evidence.

### ► CLINICAL BOTTOM LINE

Some research is required to clarify whether there is a need for serial x rays after battery ingestion. In the mean time local expert advice should be followed.