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 practicing 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 and are placed on the BestBETS web site. 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. Eight BETs are included in this issue of the journal.

1. Swimmers view or supine oblique views to visualise the cervicothoracic junction
2. Computed tomography and the exclusion of upper cervical spine injury in trauma patients with altered mental state
3. Antibiotics in compound depressed skull fractures
4. Antibiotics in patients with isolated chest trauma
5. Lignocaine (lidocaine) premedication before rapid sequence induction in head injuries
6. Ultrasound or computed tomography in paediatric blunt abdominal trauma
7. Routine use of antibiotic ointment and wound healing
8. Factor VIIa for intractable blood loss in trauma

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### Swimmers view or supine oblique views to visualise the cervicothoracic junction

**Report by Nasreen Contractor, Specialist Registrar**

**Checked by Martin Thomas, Specialist Registrar**

**Abstract**

A short cut review was carried out to establish whether swimmer's views were better than superior oblique views at visualising the C7/T1 junction. Eleven 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 36 year old man is brought to the emergency department after a road traffic accident. He complains of neck pain. A “pulled” lateral is taken, but fails to show the C7/T1 junction. You wonder whether a pair of supine oblique views or a swimmer's view would be best to visualise this region.

**Three part question**

In a [trauma patient in whom standard lateral views of the cervical spine are inadequate] is a [swimmer's view better than supine oblique views] at [visualising the C7/T1 junction]?

**Search strategy**

Medline 1966-07/02 using the OVID interface. [supine oblique.mp OR trauma oblique.mp OR swimmers view.mp OR twining.mp] AND [exp X-Rays OR x-ray$.mp or radiograph.mp OR exp radiography OR radiography.mp] AND [exp cervical vertebrae OR cervical spine.mp OR exp neck injuries OR neck injur$.mp OR cervicothoracic junction.mp] LIMIT to human AND English.

**Search outcome**

Altogether 11 papers were found of which only one was relevant to the original question (see table 1).

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### Table 1

<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>Ireland AJ et al, 1998, UK</td>
<td>427 consecutive patients who attended with acute trauma requiring cervical spine radiographs. 60 patients required additional swimmers view. 62 required additional paired supine oblique views.</td>
<td>Two phase prospective study</td>
<td>Able to visualise the vertebral bodies and posterior elements of the cervicothoracic junction</td>
<td>37% of the swimmers group and 38% of the supine oblique group were judged satisfactory. When vertebral bodies not shown adequately, 70% of supine obliques and 37% swimmers showed posterior elements adequately</td>
<td>9 patients from supine oblique group lost, therefore not included in calculations</td>
</tr>
</tbody>
</table>
Comments
While there are numerous articles expressing personal views, there is only this one paper that attempts to answer the question. This paper showed no difference in visualising the vertebral bodies of C7/T1 junction between swimmers or supine obliques, but supine obliques did visualise the posterior elements better. But 9 of 62 of supine oblique data were lost, which could have swayed the results either way. Therefore more research is needed in this area.

Abstract
A short cut review was carried out to establish whether CT scans of the upper cervical spine are necessary in trauma patients with altered mental status and normal plain radiographs. A total of 572 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 20 year old man is brought into the emergency department having been hit by a high speed vehicle while crossing the road. He has a large haematoma to the head and is confused and combative. Plain radiographs of his cervical spine are normal, as are radiographs of his chest and pelvis. You request a CT brain scan and a CT of his upper cervical spine, as you have heard that plain radiographs can miss injuries in this area. The radiologist does not agree that this is indicated as the plain radiographs of the cervical spine appear normal. You wonder if there is any evidence to support your request.

Three part question
In [trauma patients with altered mental status] is [plain radiography as good as CT] at [diagnosing significant upper cervical spine injuries]?

Computed tomography and the exclusion of upper cervical spine injury in trauma patients with altered mental state
Report by Martin Thomas, Specialist Registrar
Checked by Stewart Teece, Clinical Research Fellow

<table>
<thead>
<tr>
<th>Table 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Author, date and country</td>
</tr>
<tr>
<td>Kirshenbaum KJ, et al 1990, USA</td>
</tr>
<tr>
<td>Woodring JH and Lee C, 1993, USA</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
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<td></td>
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<tr>
<td>Link TM et al, 1995, Germany</td>
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<tr>
<td>Aciiri AE et al, 1998, Australia</td>
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<tr>
<td>Berne JD et al, 1999, USA</td>
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<td></td>
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<tr>
<td>Schenarts PJ et al, 2001, USA</td>
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</tr>
</tbody>
</table>
Antibiotics in compound depressed skull fractures

Report by Baha Ali, Senior Clinical Fellow
Checked by Angaj Ghosh, Senior Clinical Fellow

Abstract
A short cut review was carried out to establish whether antibiotics reduce the incidence of meningitis in patients with compound depressed skull fracture. Altogether 198 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 23 year old man attends the emergency department having been assaulted outside a nightclub with a hammer. He has sustained an isolated head injury with no loss of consciousness and is fully alert and oriented. He has a compound depressed left parietal skull fracture (confirm and defined by CT scan). No surgical intervention is considered. You wonder whether the administration of antibiotics will reduce the chance of meningitis developing.

Three part question
In an adult with compound depressed skull fracture does [the administration of antibiotics] reduce [the incidence of meningitis]?

Search strategy
Medline 1996–07/02 using the OVID interface. [(exp skull fractures OR skull fracture§.mp) OR (exp fractures, open OR compound fracture§.mp OR depressed fracture§.mp) AND exp skull OR skull§.mp OR cranium§.mp OR calvarium§.mp)] AND (exp antibiotics OR antibiotic§.mp OR exp pharmacology OR specificity.mp) OR exp tomography, x-ray computed OR computed tomography.mp OR exp x-rays OR x-ray§.mp] LIMIT to human AND English.

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>Mendelow AD et al, 1983, Edinburgh</td>
<td>223 patients were admitted to the Edinburgh Royal Infirmary (head and spinal injury unit) with depressed fracture of the skull over the 8-year period 1971-1978. 176 patients with compound depressed skull fracture</td>
<td>Retrospective study</td>
<td>107 patient had ampicillin and sulphonamide, one patient developed meningitis and ventriculitis. 45 patients had other prophylactic antibiotics. four developed meningitis and brain abscess. 19 patient had no antibiotics, one developed meningitis</td>
<td>Early treatment with ampicillin and sulphonamide, in addition to adequate surgical debridement, is recommended in patient with compound depressed skull fractures.</td>
<td>The group designated (other combinations) was made up of patient on a variety of antibiotics, the number on each antibiotic being too small for individual analysis. They accepted that, there are other factors related to the occurrence of the infection.</td>
</tr>
</tbody>
</table>
The incidence of infectious complications other than meningitis in the non-antibiotic group was higher than in the group given antibiotics.

**CLINICAL BOTTOM LINE**

The results of this study do not provide a definitive answer regarding the role of antibiotics in preventing meningitis. There is very little evidence about giving antibiotic in depressed compound skull fracture. Local advice should be followed.


### Antibiotics in patients with isolated chest trauma requiring chest drains

**Report by John Butler, Specialist Registrar**

**Checked by Ian Sammy, Consultant, and Joel Desmond, Research Fellow**

**Abstract**

A short cut review was carried out to establish whether the administration of antibiotics reduces the incidence of intra-thoracic infection in patients who have had a chest drain inserted after trauma. Altogether 321 papers were found using the reported search, of which two 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 25 year old man is stabbed in the chest during a pub brawl. He sustains an isolated chest injury that requires a tube thoracostomy. You wonder whether the administration of prophylactic antibiotics will reduce the incidence of intrathoracic infection in this patient.

**Three part question**

In [patients suffering isolated penetrating chest injuries which require tube thoracostomy] does [the administration of prophylactic antibiotics] reduce [the incidence of intrathoracic infection]?

**Search strategy**

Medline 1966 to 8/02 using the OVID interface. ({exp thoracic injuries OR chest injury.mp OR exp Chest tubes OR exp Thoracostomy OR chest drain.mp OR chest tube$.mp OR thoracostomy.mp } AND {exp antibiotic prophylaxis OR antibiotic prophylaxis.mp OR exp antibiotics OR antibiotics.mp OR prophylactic antibiotics.mp}) LIMIT to human AND English.

**Search outcome**

Altogether 321 papers were found, of which 308 were irrelevant or of insufficient quality. The remaining paper is shown in table 3.

**Comment(s)**

The identified references were small and these studies look at chest drains inserted under differing clinical situations and by differing grades of clinicians.

### Table 4

<table>
<thead>
<tr>
<th>Author 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>Gonzalez RP et al</td>
<td>139 patients with isolated chest injuries either blunt (34) or penetrating (105) with ISS scores of 9 or 10 requiring tube thoracostomy.</td>
<td>Double blind PRCT</td>
<td>Empyema/pneumonia</td>
<td>Antibiotic group - No infection v placebo group - 2 empyemas, 2 pneumonias. Fisher’s exact test p=0.05</td>
<td>Sample size not justified Small number of positive cases in the placebo group.</td>
</tr>
<tr>
<td>Luchette FA et al</td>
<td>4 double blinded PRCTs, 5 PRCTs and 2 meta-analyses Search methodology - Medline search 1977-1997 using chest tubes, human, drainage, tube thoracostomy, infection, empyema, bacterial infection prevention and control. (this identified 44 references of relevance) bibliographies of identified references were searched. Articles reviewed by 5 trauma surgeons, 2 pharmacists and a health care economist.</td>
<td>Meta-analysis</td>
<td>Pneumonia</td>
<td>Antibiotic group 4.1%</td>
<td>This well conducted systematic review pointed out that of the 9 primary studies found, Demetriates et al gave a single dose of antibiotics to all pts before randomisation thus they excluded it from further pooled results. Of the 8 other studies, only 4 were double blinded and only 3 had applied Center for Disease Control criteria for pneumonia and Empyema. Despite the weaknesses in the evidence the EAST group recommends that there is sufficient class 1 and 2 evidence to recommend 24 hours of a first generation cephalosporin.</td>
</tr>
<tr>
<td>MR, 1998, USA</td>
<td>2 empyemas, 2 pneumonias. Fisher’s exact test p=0.05</td>
<td>Emphyema</td>
<td>Antibiotic group 5.0%</td>
<td>Antibiotic group - No infection v placebo group - 2 empyemas, 2 pneumonias. Fisher’s exact test p=0.05</td>
<td></td>
</tr>
<tr>
<td>MR, 1998, USA</td>
<td>Antibiotic group 4.1%</td>
<td>14/338 Placebo group 14% [49/332] p=0.001</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MR, 1998, USA</td>
<td>Antibiotic group 0.6%</td>
<td>2/338 Placebo group 8.7% [29/332] P&lt;0.0001</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MR, 1998, USA</td>
<td>Antibiotic group 5.0%</td>
<td>17/338 Placebo group 23.2% [77/332] p&lt;0.0001 (note ?small adding up error in total figures published by journal)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Table 4**

**Antibiotics in patients with isolated chest trauma requiring chest drains**

**Report by John Butler, Specialist Registrar**

**Checked by Ian Sammy, Consultant, and Joel Desmond, Research Fellow**

**Abstract**

A short cut review was carried out to establish whether the administration of antibiotics reduces the incidence of intrathoracic infection in patients who have had a chest drain inserted after trauma. Altogether 321 papers were found using the reported search, of which two 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 25 year old man is stabbed in the chest during a pub brawl. He sustains an isolated chest injury that requires a tube thoracostomy. You wonder whether the administration of prophylactic antibiotics will reduce the incidence of intrathoracic infection in this patient.

**Three part question**

In [patients suffering isolated penetrating chest injuries which require tube thoracostomy] does [the administration of prophylactic antibiotics] reduce [the incidence of intrathoracic infection]?

**Search strategy**

Medline 1966 to 8/02 using the OVID interface. ({exp thoracic injuries OR chest injury.mp OR exp Chest tubes OR exp Thoracostomy OR chest drain.mp OR chest tube$.mp OR thoracostomy.mp } AND {exp antibiotic prophylaxis OR antibiotic prophylaxis.mp OR exp antibiotics OR antibiotics.mp OR prophylactic antibiotics.mp}) LIMIT to human AND English.

**Search outcome**

Altogether 321 papers were found, of which 308 were irrelevant or of insufficient quality. The remaining paper is shown in table 3.

**Comment(s)**

The identified references were small and these studies look at chest drains inserted under differing clinical situations and by differing grades of clinicians.
Lignocaine premedication before rapid sequence induction in head injuries

Report by John Butler, Specialist Registrar
Checked by Rupert Jackson, Specialist Registrar

Abstract
A short cut review was carried out to establish whether pretreatment with lignocaine (lidocaine) reduces the rise in intracranial pressure associated with intubation of head injured patients. Altogether 85 papers were found using the reported search, of which three were relevant to the question. These are shown in table 5.

Search strategy
Medline and Embase 1966–07/02 using the OVID interface. [exp Lignocaine OR lidocaine$.mp OR lignocaine$.mp] AND [exp Intracranial pressure OR intracranial pressure.mp OR ICP.mp] LIMIT to human AND English AND remove duplicates.

CLINICAL BOTTOM LINE
There is no high quality evidence to support the use of a pretreatment dose of lignocaine in addition to neuromuscular block in patients with head injuries requiring a rapid sequence intubation in the emergency department. Its use remains controversial.


Ultrasound or computed tomography in paediatric blunt abdominal trauma

Report by Ross Murphy, Senior Clinical Fellow
Checked by Angaj Ghosh, Senior Clinical Fellow

Abstract
A short cut review was carried out to establish whether computed tomography is superior to ultrasonography at identifying intra-abdominal injury in children. Altogether 123 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.

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>Donegan MF et al, 1980, USA</td>
<td>10 ventilated comatose patients on ICU / IV lignocaine 1.5 mg/kg v N/Saline</td>
<td>Double blind PRCT</td>
<td>Change in ICP on suctioning</td>
<td>Lignocaine attenuated rise in ICP</td>
<td>Small numbers; Patients not paralysed</td>
</tr>
<tr>
<td>White PF et al, 1982, USA</td>
<td>15 comatose patients with diffuse axonal injury on ICU</td>
<td>RCT</td>
<td>Change in ICP on suctioning</td>
<td>Reduced with lignocaine and thiopentone</td>
<td>No effect</td>
</tr>
<tr>
<td></td>
<td>Compared response to suction with:</td>
<td></td>
<td></td>
<td>Unblinded</td>
<td>Questionable randomisation</td>
</tr>
<tr>
<td></td>
<td>9 ventilated</td>
<td></td>
<td></td>
<td>Unblinded</td>
<td></td>
</tr>
<tr>
<td></td>
<td>9 patients with severe head injury (GCS&lt;8) All patients had mild cranial high BP. All ventilated</td>
<td>RCT compared response on suctioning. IV lignocaine v intratracheal lignocaine. Readings at 1, 3, 5, 10, 15 min</td>
<td>Change in baseline ICP</td>
<td>No change in baseline ICP</td>
<td>Unblinded</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Change in ICP on suctioning</td>
<td>Both methods reduced ICP</td>
<td>Small numbers</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Comparison of routes</td>
<td>Intratracheal route more effective</td>
<td>Patients not paralysed</td>
</tr>
</tbody>
</table>
Clinical scenario
A 6 year old boy presents to the emergency department after falling out of a fast moving car. He is extremely distressed and appears to have sustained multiple injuries including a large laceration to his head, bruising and deformity to both forearms and his left lower leg. After initial assessment and stabilisation you decide to paralyse, intubate, and ventilate him before performing a head CT. However you are also concerned about the possibility of an intra-abdominal injury. You wonder whether an ultrasound or CT would be better at identifying this.

Three part question
In [a paediatric patient with blunt abdominal trauma] is [an ultrasound scan] better at identifying [intra-abdominal injury] than [a CT scan]?

Search strategy
Medline 1966-07/02 using the OVID interface. [exp abdominal injuries OR “abdominal injur$” .mp OR “abdominal trauma” .mp] AND [exp tomography, x-ray computed OR “computed tomograph$” .mp OR “computerised tomograph$” .mp OR CT.mp] AND [exp ultrasonography OR ultrasonography.mp OR exp ultrasonics OR ultrasonics.mp Or ultrasound.mp] AND [exp adolescence OR exp child OR exp child of impaired parents OR exp child, abandoned OR exp child, exceptional OR exp child, hospitalised OR exp child, institutionalised OR exp child, preschool OR exp child, unwanted OR exp disabled children OR exp homeless youth/ OR exp infant OR exp only child OR child$ .mp OR exp Pediatrics OR pediatric$ .mp OR paediatric$ .mp] LIMIT to human AND English.
Routine use of antibiotic ointment and wound healing

Report by A Van Zyl, D Abbott, D Andrews, P Reaves, Senior House Officers
Checked by Hamish Simpson, Consultant
Abstract
A short cut review was carried out to establish whether topical antibiotics improved the outcome of simple wounds. Altogether 71 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 26 year old man attends the emergency department with a simple laceration requiring suturing. You wonder whether application of a topical antibiotic ointment will promote healing and reduce incidence of infection.

Three part question
In [adults with non-contaminated lacerations] does [the application of topical antibiotics] reduce [the incidence of secondary infection, the length of time dressings are required and achieve a better cosmetic result]?

Search strategy
Medline 1966–07/02 using the OVID interface. {((exp administration, topical OR topical therapy.mp) AND (exp antibiotics OR antibiotic$.mp) OR “topical antibiotic$“.mp) AND (exp ointments OR ointments.mp)) AND [exp Staphylococcal infections OR exp Skin OR superficial wound$.mp OR exp Wound healing OR exp Wound infection OR exp”Wounds and Injuries”] LIMIT to human AND English.

Search outcome
Altogether 71 papers were found of which 70 were irrelevant or of insufficient quality for inclusion. The remaining paper is shown in table 7.

Comment(s)
Although this study suggests that antibiotic ointment reduces incidence of infection there are a number of reasons at the moment why we would be reluctant to change current clinical practice. The intensive wound care used in the study may not mirror our own practice. Long term results and patients own assessment of outcome may be better indicators of the benefit of topical antibiotics, than the short-term effects measured in this trial.

Factor VIIa for intractable blood loss in trauma

Report by Jon Argall, Senior Clinical Fellow
Checked by Stewart Teece, Clinical Research Fellow
Abstract
A short cut review was carried out to establish whether factor VIIa is indicated in patients suffering intractable blood loss after trauma. Altogether 39 papers were found using the reported search, of which two 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 29 year old man is brought into the resuscitation area having jumped out of a fourth floor window. He has abdominal and pelvic injuries but no chest, head, or limb injuries. He is bleeding intractably and the orthopaedic team and surgical team cannot agree on a plan of management. You suggest that factor VIIa would help to stabilise the patient and reduce his requirement for transfusion.

Three part question
In [trauma patients with major blood loss and intractable bleeding requiring massive transfusion] does [recombinant factor VIIa] reduce [morbidity and mortality]?}

Search strategy
Medline 1966–07/02 using the OVID interface. [exp Factor VII OR exp Factor VIIa OR (factor adj5 VII).af OR (factor

Search outcome
Altogether 59 papers were found of which two were relevant. The details are shown in table 8.

Table 8

<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>Kenet et al, 1999, Israel</td>
<td>One 19 year old male soldier with life threatening bleeding from IVC</td>
<td>Case report</td>
<td>Mortality</td>
<td>Slowing of blood loss and surgical control of bleeding was achieved with example two doses of recombinant factor VIIa</td>
<td>Only one case example</td>
</tr>
<tr>
<td>Martinowitz et al, 2001, Israel</td>
<td>Seven massively bleeding, multi transfused, coagulopathic trauma patients were treated with recombinant factor VIIa after failure of conventional methods to achieve haemostasis</td>
<td>Case series</td>
<td>Reduction in transfusion requirements</td>
<td>Reduction from 20 - 31.8 seconds, to 8 - 12 seconds and 46 - 110 seconds to 28 - 46 seconds respectively</td>
<td>Small study No controls</td>
</tr>
</tbody>
</table>

Comment(s)
More studies are needed.

CLINICAL BOTTOM LINE
Factor VIIa may have a role as a temporising adjunct to surgical haemostasis. Further research is needed.

Antibiotics in compound depressed skull fractures

Baha Ali, Angaj Ghosh and K Mackway-Jones

_Emerg Med J_ 2002 19: 552-553
doi: 10.1136/emj.19.6.552

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