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 Infirmary1 or placed on the BestBETs web site. 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.org3 Eight BETs are included in this issue of the journal.

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

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 Infirmary1 or placed on the BestBETs web site. 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.org3 Eight BETs are included in this issue of the journal.

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

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$.mp or radiograph.mp OR exp radiography OR radiography.mp] AND [exp cervical vertebrae OR cervical spine.mp OR exp neck injuries OR neck injury$.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).

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.

> CLINICAL BOTTOM LINE
Local advice should be followed.


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

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]?

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>Kerberbaum KJ, et al 1990, USA</td>
<td>50 consecutive patients with significant head trauma</td>
<td>Prospective case series</td>
<td>Number of patients with significant upper cervical spine fractures</td>
<td>4 v 0</td>
<td>Sensitivity of CT not assessed</td>
</tr>
<tr>
<td>Woodring JH and Lee C, 1993, USA</td>
<td>216 consecutive patients with acute traumatic fractures, subluxations or dislocations of cervical vertebrae</td>
<td>Retrospective case series</td>
<td>Fractures seen at time on plain film trauma series</td>
<td>39%</td>
<td>Retrospective nature of study</td>
</tr>
<tr>
<td></td>
<td>CT of entire cervical spine and plain films performed on all patients</td>
<td></td>
<td>Fractures seen on plain films in retrospect</td>
<td>58%</td>
<td>CT sensitivity not assessed</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Subluxations and dislocations seen at time on plain films</td>
<td>64%</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Subluxations and dislocations seen on plain films in retrospect</td>
<td>93%</td>
<td></td>
</tr>
<tr>
<td>Link TM et al, 1995, Germany</td>
<td>202 patients with head injuries and GCS&lt;7</td>
<td>Prospective consecutive series</td>
<td>Number of fractures of C1 or C2 identified by CT or radiography</td>
<td>28 (13.9% of patients)</td>
<td>Wide age range (3-86)</td>
</tr>
<tr>
<td></td>
<td>37 (18.3% of patients) had fractures of occipital condyles, C1 or C2</td>
<td></td>
<td>Number of fractures of C1 or C2 identified by plain radiographs alone</td>
<td>17 (60.7% of those identified by CT)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Mean time to perform (conventional) CT of upper cervical spine</td>
<td>8 minutes</td>
<td></td>
</tr>
<tr>
<td>Aciati AE et al, 1998, Australia</td>
<td>91 major trauma patients with injuries to head or neck, or multiple injuries</td>
<td>Prospective consecutive case series</td>
<td>Total patients identified with unstable cervical injury</td>
<td>6 (6.6%)</td>
<td>CT not uniformly performed - possible that significant number of false negative radiographs missed.</td>
</tr>
<tr>
<td></td>
<td>12 with abnormal or equivocal radiographs had CT scans. 48 unconscious or uncooperative with normal radiographs had passive flexion-extension views</td>
<td></td>
<td>Patients identified as having unstable cervical injury with normal initial radiographs by flexion-extension views</td>
<td>1 (1.1%)</td>
<td></td>
</tr>
<tr>
<td>Berne JD et al, 1999, USA</td>
<td>58 high risk blunt trauma patients, with inability to evaluate cervical spine clinically, ICU</td>
<td>Prospective consecutive case series</td>
<td>Number of patients with unstable injuries</td>
<td>12 (20.7%)</td>
<td>Radiographic protocol violations in 9 patients of original 67 meeting criteria</td>
</tr>
<tr>
<td></td>
<td>All patients underwent plain lateral and AP +/- odontoid view when possible in non-intubated patients, and subsequent complete cervical helical CT (C0 to T1)</td>
<td></td>
<td>Number of patients with unstable injuries</td>
<td>8 (13.8%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CT v radiography</td>
<td></td>
<td>Sensitivity</td>
<td>18/20 (90%) v 12/20 (60%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Specificity</td>
<td>38/38 (100%)</td>
<td></td>
</tr>
<tr>
<td>Schenarts PJ et al, 2001, USA</td>
<td>1356 blunt trauma patients, aged over 14, with altered mental status (mean GCS 11) requiring CT evaluation of 2 or more body systems</td>
<td>Prospective consecutive case series</td>
<td>Number of patients in whom cervical spine injuries identified overall</td>
<td>70 (5.2% of all eligible patients)</td>
<td>Unblinded radiological review</td>
</tr>
<tr>
<td></td>
<td>CT of C0-C3, in addition to five view plain film series, CT v radiography</td>
<td></td>
<td>Number of patients in whom cervical spine injuries identified</td>
<td>67 v 38</td>
<td>Haemodynamically unstable patients, those dying before plain films, those requiring immediate surgery excluded</td>
</tr>
</tbody>
</table>
Clinical Bottom Line

In high risk patients with reduced level of consciousness there is a high incidence of cervical spine injuries. In addition, CT scans cannot be used to reliably exclude cervical spine injury in the polytraumatised patient with altered mental status. The upper cervical spine should be scanned during CT scanning of the head in the polytraumatised patient with coma.

Comment(s)

The results of most of the studies outlined above indicate that in high risk patients with reduced level of consciousness there is an incidence of upper cervical spine injury between 5.2% and 13.9% (with the patients in the study by Berne et al having an incidence of 35%). The sensitivity of plain radiography has usually been found to be between 39% and 61%. If the incidence of cervical spine injury is estimated as 8%, and the sensitivity of plain films taken to be 50%, this means that 4%, or 1 in 25, of polytrauma patients with a reduced level of consciousness will have an upper cervical spine injury not evident on plain radiographs. The missed spinal injuries included unstable fractures in all studies where stability was considered. It should be noted that not all studies limited themselves to the upper cervical spine, though the majority of missed injuries occurred either here or in the C7/T1 region, where this could not be adequately visualised on plain radiographs. Further studies involving helical CT scanning of the entire cervical spine are planned.

Possible drawbacks of routine CT imaging of the upper cervical spine include adverse events occurring as a result of spending longer periods in the CT scanner. Such events were not specifically sought in any of the studies described. Spiral CT scanners, with faster scanning times, should minimise this risk. In addition, CT scans cannot be used to reliably exclude ligamentous injuries—other imaging modalities are required for this.

Search strategy

Medline 1966–07/02 using the OVID interface. [Exp spinal injuries OR exp spinal fractures OR ((exp odontoid process OR exp axis OR exp atlas OR exp atlanto-axial joint OR exp cervical vertebral OR odontoid.mp OR cervical.mp OR dens.mp OR cervical spine.mp) AND (exp “wounds and injuries” OR trauma.mp OR exp fractures OR exp fractures, open OR exp dislocations OR fracture.mp OR dislocation.mp)) AND (exp confusion OR exp coma OR exp coma, post-head injury OR exp cranioencebral trauma OR head trauma.mp OR exp brain injuries OR head inj.mp OR exp intubation, intratracheal OR exp craniocerebral trauma OR head trauma.mp OR exp brain injuries OR head inj.mp OR exp intubation, intratracheal OR exp intubation OR exp delirium, dementia, amnestic, cognitive disorders OR altered mental status.mp OR unconscious.mp OR intubated.mp OR rapid sequence induction.mp OR coma.mp OR confusion.mp OR unevaluable.mp)] AND [exp “sensitivity-and-specificity” OR sensitivity.mp OR exp diagnosis OR exp pathology OR specificity.mp] OR exp tomography, x-ray computed OR computed tomography, OR exp x-rays OR x-ray$ OR x-ray$.mp] LIMIT to human AND English.

Search outcome

Altogether 572 papers were found of which 566 were irrelevant or of insufficient quality for inclusion. The remaining six papers are shown in table 2.

Comment(s)

The results of most of the studies outlined above indicate that in high risk patients with reduced level of consciousness there is an incidence of upper cervical spine injury between 5.2% and 13.9% (with the patients in the study by Berne et al having an incidence of 35%). The sensitivity of plain radiography has usually been found to be between 39% and 61%. If the incidence of cervical spine injury is estimated as 8%, and the sensitivity of plain films taken to be 50%, this means that 4%, or 1 in 25, of polytrauma patients with a reduced level of consciousness will have an upper cervical spine injury not evident on plain radiographs. The missed spinal injuries included unstable fractures in all studies where stability was considered. It should be noted that not all studies limited themselves to the upper cervical spine, though the majority of missed injuries occurred either here or in the C7/T1 region, where this could not be adequately visualised on plain radiographs. Further studies involving helical CT scanning of the entire cervical spine are planned.

Possible drawbacks of routine CT imaging of the upper cervical spine include adverse events occurring as a result of spending longer periods in the CT scanner. Such events were not specifically sought in any of the studies described. Spiral CT scanners, with faster scanning times, should minimise this risk. In addition, CT scans cannot be used to reliably exclude ligamentous injuries—other imaging modalities are required for this.

Clinical Bottom Line

The upper cervical spine should be scanned during CT scanning of the head in the polytraumatised patient with reduced level of consciousness.

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. 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>
<td></td>
</tr>
</tbody>
</table>
penicillin OR penicillin$ OR benzylpenicillin.mp OR exp metronidazole OR metronidazole.mp OR flagyl.mp} LIMIT to human AND English language.

Search outcome
Altogether 198 papers were found, 197 of which were irrelevant or of insufficient quality. The remaining paper is shown in table 3.

Comment(s)
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 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 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. One paper was a systematic review of 11 other relevant papers up to 1997 that were also found on our search. Only one other relevant paper was found after this date. Therefore the systematic review and the remaining paper are included in table 4.

Comment(s)
The EAST Practice Management Group have recently performed an excellent quality systematic review on this subject that included all other studies except Gonzalez et al. They give figures that show that the number needed to treat with antibiotics to prevent an intrathoracic infection is six. They caution that the available studies are 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, 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>Gonzalez RP and Holevar MK, 1998, USA</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 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 for EAST practise management guidelines work group, 2000, USA</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% (14/338) Placebo group 14% (49/332) p=0.001</td>
<td>This well conducted systematic review pointed out that of the 9 primary studies found, Demitriates et al gave a single dose of antibiotics to all pts before randomisation thus they excluded it from further pooling results. Of the 8 other studies, only 4 were double blind 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></td>
<td></td>
<td></td>
<td>Empyema</td>
<td>Antibiotic group 0.6% (2/338) Placebo group 8.7% (29/332) p=0.0001</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Total thoracic infection rate</td>
<td>Antibiotic group 5.0% (14/277) Placebo group 23.2% (77/332) p&lt;0.0001 (note ?small adding up error in total figures published by journal)</td>
<td></td>
</tr>
</tbody>
</table>

www.emjonline.com
CLINICAL BOTTOM LINE
Administration of prophylactic antibiotics to patients requiring chest tube thoracostomy for isolated chest injuries reduces the incidence of intrathoracic infection especially empyema with an number needed to treat of six. The ideal regimen is 24 hours of a first generation cephalosporin.


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 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 patient attends the emergency department having sustained a blunt head injury. On examination they have clinical signs of raised intracranial pressure from the rapid sequence intubation. You wonder whether the pretreatment with lignocaine will attenuate the rise in intracranial pressure from the rapid sequence intubation.

Three part question
In [head injured patients with signs of raised intracranial pressure who need RSI and ventilation] is [pretreatment with lignocaine better than placebo] at [attenuating the rise in intracranial pressure associated with RSI]?

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

Search outcome
Altogether 85 papers were found of which three were relevant to the question. These are shown in table 5.

Comment(s)
Some 40%–60% of patients with coma producing brain injuries will have intracranial hypertension. The National Emergency Airway Course recommends a pretreatment dose of lignocaine (1.5 mg/kg) given three minutes before induction when intubating head injured patients. Analysing the results of the above search there seems to be little high quality evidence available to show that intravenous lignocaine suppresses the rises in intracranial pressure associated with rapid sequence intubation in head injured patients.

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>Compared response to suctioning</td>
<td>Change in baseline ICP</td>
<td>Reduced with lignocaine and thiopentone</td>
<td>Unblinded, Questionable randomisation</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Change in ICP on suctioning</td>
<td>No effect</td>
<td></td>
</tr>
<tr>
<td>Yano M et al, 1982, USA</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 intrathoracic 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></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Comparison of routes</td>
<td>Intrathoracic route more effective</td>
<td></td>
</tr>
</tbody>
</table>

www.emjonline.com
Table 6

<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>Kaufman RA et al, 1984, USA</td>
<td>95 children with suspected intra-abdominal injury Abdominal CT with contrast vs abdominal ultrasound</td>
<td>Diagnostic test study</td>
<td>Intra-abdominal fluid or organ injury identified on initial CT or ultrasound identified at any stage by any means</td>
<td>2 false negative and 6 false positive CT scans 18 false negative and 3 false positive ultrasound scans</td>
<td>No real gold standard</td>
</tr>
<tr>
<td>Rossi D et al, 1993, Belgium</td>
<td>38 children with intra-abdominal injuries Abdominal CT with contrast vs abdominal ultrasound</td>
<td>Diagnostic test study</td>
<td>Intra-abdominal fluid or organ injury identified on initial CT or ultrasound identified at any stage by any means</td>
<td>CT identified 30 out of 31 cases with intra-abdominal fluid. Ultrasound identified 37 out of 38 cases with intra-abdominal fluid CT identified organ injury in 33 out of 38 cases. Ultrasound identified organ injury in 14 out of 31 cases</td>
<td>Retrospective Not all patients had both tests No real gold standard</td>
</tr>
<tr>
<td>Akgur FM et al, 1997, Turkey</td>
<td>60 children with blunt abdominal trauma who had abnormal findings on abdominal ultrasound Abdominal CT vs abdominal ultrasound</td>
<td>Diagnostic test study</td>
<td>Intra-abdominal fluid or organ injury identified at any stage by any means</td>
<td>CT identified the source of intra-abdominal fluid in 3 patients in whom ultrasound could not identify a source</td>
<td>Sample group selective No real gold standard</td>
</tr>
<tr>
<td>Richardson MC et al, 1997, UK</td>
<td>26 children with blunt abdominal trauma Abdominal CT vs contrast vs abdominal ultrasound</td>
<td>Diagnostic test study</td>
<td>CT missed 1 injury. Ultrasound diagnosed organ specific injury in 22 out of 24 patients. Ultrasound diagnosed organ specific injury in 12 out of 24 patients. Both correctly identified 2 cases of no injury</td>
<td>CT identified 7 intra-abdominal injuries not identified on ultrasound</td>
<td>Retrospective Sample group selective No real gold standard</td>
</tr>
<tr>
<td>Patrick DA et al, 1998, USA</td>
<td>100 children who had abdominal CT and ultrasound performed as investigations for blunt abdominal trauma Abdominal CT vs abdominal ultrasound performed by an emergency physician</td>
<td>Diagnostic test study</td>
<td>Intra-abdominal fluid. Organ injury identified identified on initial CT or ultrasound identified at any stage by any means</td>
<td>CT identified 7 intra-abdominal injuries not identified on ultrasound</td>
<td>Retrospective Sample group selective No real gold standard</td>
</tr>
<tr>
<td>Richards JR et al, 2002, USA</td>
<td>744 consecutive children undergoing ultrasonography for trauma</td>
<td>Prospective cohort study</td>
<td>Detection of haemoperitoneum</td>
<td>US 56.5% sensitivity, 97% specificity</td>
<td>No real gold standard</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.

Search outcome
Altogether 123 papers were found, of which 117 were irrelevant or of insufficient quality. The remaining six papers are shown in table 6.

Comment(s)
The studies do seem to indicate that CT is better than ultrasound at identifying intra-abdominal injury in children. However, as it is impossible to confirm most of the injuries identified on imaging, it is also difficult to compare the two imaging techniques with a definite gold standard.

This also needs to be considered in the light of the clinical scenarios encountered by emergency physicians. Because of the need for transport and the time it takes to perform CT, children with blunt abdominal trauma need to be stable and have no other injuries requiring urgent treatment. Most will also require sedation. Ultrasound can be performed in the resuscitation room, is much quicker, and is much less distressing to a terrified child.

> CLINICAL BOTTOM LINE
CT is better than ultrasound at identifying intra-abdominal injury in children.

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.

> CLINICAL BOTTOM LINE
There is not enough evidence here to change current practice. A large multicentre study is indicated to provide more relevant answers.


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 recombinant factor VIIa 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

<table>
<thead>
<tr>
<th>Author, date and country</th>
<th>Patient group</th>
<th>Study type (level of evidence)</th>
<th>Key results</th>
<th>Outcomes</th>
<th>Study weaknesses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dire DJ et al, 1995, USA</td>
<td>465 patients with minor uncomplicated soft tissue wounds necessitating suturing attending an emergency department: Puncture wounds, wounds over 12 hours old, underlying fracture or neurovascular complication, allergies to agents used, antibiotics within previous 7 days and pregnant or immunocompromised patients were excluded</td>
<td>Double blind randomised controlled trial</td>
<td>Evidence of infection</td>
<td>Antibiotic ointment is better at reducing infection than petrolatum alone</td>
<td>No mention of methods of randomisation</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Wounds treated differently initially</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Subjective measurements</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Patients responsible for own wound care</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Dubious recruitment strategy</td>
</tr>
</tbody>
</table>

Table 7

Search outcome
Altogether 59 papers were found of which two were relevant. The details are shown in 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 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, Shortening of PTR and APTT, Increase in factor VII levels, Mortality</td>
<td>Reduction from 25 - 49 units, to 1 - 2 units, to 8 - 12 seconds and 48 - 110 seconds respectively, from 0.7 - 0.92 IU/ml, to 18 - 44 IU/ml</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.