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

Edited by K Mackway-Jones

Best evidence topic reports (BETs) summarise the evidence pertaining to particular clinical questions. They are not systematic reviews, but rather contain the best (highest level) evidence that can be practically obtained by busy practising clinicians. The search strategies used to find the best evidence are reported in detail in order to allow clinicians to update searches whenever necessary. The BETs published below were first reported at the Critical Appraisal Journal Club at the Manchester Royal Infirmary or placed on the BestBETs 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 the bestbets web site (http://www.bestbets.org). Ten BETs are included in this issue of the journal.

- Investigating microscopic haematuria in blunt abdominal trauma
- How to remove a tick
- Plaster or functional splint in gamekeepers thumb
- Perimortem caesarean section
- Topical antibiotics in acute bacterial conjunctivitis
- Bell’s palsy and acyclovir
- Tape stripping the stratum corneum and the effectiveness of EMLA
- Staples or sutures for repair of scalp laceration in adults
- Staples or sutures in children with scalp lacerations
- Tangential views or computed tomography in suspected depressed skull fracture

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Investigating microscopic haematuria in blunt abdominal trauma

Report by Fiona Saunders, Specialist Registrar
Search checked by Jon Argall, Senior Clinical Fellow

Abstract

A short cut review was carried out to establish whether it is necessary to carry out further imaging in order to identify clinically significant renal injury in patients with microscopic haematuria after blunt abdominal trauma. Altogether 57 papers were found using the reported search, of which 10 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 presents to the emergency department following a road traffic accident. He is found to have loin pain and tenderness and microscopic haematuria on dipstick testing. He is not hypotensive and has no other major injuries. You wonder whether radiological imaging is necessary to exclude significant injury to the renal tract?

Three part question

[In adults with microscopic haematuria after blunt abdominal trauma is radiological imaging necessary] to [identify clinically significant renal injury]?

Search strategy

Medline 1966–10/01 using the OVID interface, Embase 1988–10/01. [exp haematuria OR haematuria.mp] AND microscopic.mp AND trauma.mp

Search outcome

Altogether 55 publications identified, 15 of these have direct relevance to the three part question. A further two relevant papers were referenced in these. Of these 17 papers 10 were of sufficient quality for inclusion (see table 1).

Comment(s)

Numerous retrospective and prospective diagnostic cohort studies attempt to answer the same question. Many are of a high standard and large size. Only those in which the whole cohort underwent diagnostic imaging have been included. Most measured the same variables and used comparable definitions of significant renal injury. Combining the data from the included studies there are 2302 cases of microscopic haematuria after blunt abdominal trauma, in patients who were not shocked and had no major associated injuries. Of these one had a clinically significant renal injury.

Clinical bottom line

Radiological imaging of the renal tract is not indicated in adults with microscopic haematuria after blunt abdominal trauma, provided they are not shocked and have no major associated injuries.


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Clinical scenario
A 27 year old hiker attends with what appears to be a tick in the skin of his right leg. You seek the advice of your colleagues on the best method of removal, the registrar advises you to pull it straight out, another registrar suggests to pull out anticlockwise, the consultant denounces them as fools and says to pull clockwise. Sister suggests suffocating the tick with vaseline and a staff nurse thinks that nail varnish is better for this, a passing porter suggests burning it off with a lighten fix and the patient himself claims that his mother always recommended 70% isopropyl alcohol (for the removal of ticks). Confused you wonder whether there is any evidence for any of the suggested methods.

Three part question
In [patients with ticks attached to their skin] is [any of the popular methods better than the others] for [removal of an intact tick]?

Search strategy
Medline 1966–04/02 using the OVID interface. [exp ticks OR ticks.mp OR arachnïs.mp OR tick.mp OR acarines.mp OR ixodes.mp OR parasites$ OR bloodsucker.mp OR dermacentor.mp OR amblyomma.mp OR ceratopogidae.mp] AND [exp”bites and stings” OR bite$.mp] AND [exp foreign bodies OR removal.mp OR excis.mp]

Search outcome
Altogether 40 papers found of which 38 were irrelevant or of insufficient quality for inclusion. The remaining two are shown in table 2.

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>Cecie K, et al, 1983, USA</td>
<td>156 patients having IVP for haematuria following trauma</td>
<td>Retrospective diagnostic cohort study</td>
<td>Number with significant renal injury</td>
<td>0/123 patients with microscopic haematuria</td>
<td>Presence of shock or other injuries not addressed Includes children Includes children</td>
</tr>
<tr>
<td>Nicolaien GS et al, 1985, USA</td>
<td>306 patients with blunt renal trauma</td>
<td>Prospective diagnostic cohort study</td>
<td>Number with significant renal injury</td>
<td>0/221 patients with blunt trauma, microscopic haematuria and no shock</td>
<td>Includes children</td>
</tr>
<tr>
<td>Fortune JB et al, 1985, USA</td>
<td>195 patients having IVP following blunt trauma</td>
<td>Retrospective diagnostic cohort study</td>
<td>Number with significant renal injury</td>
<td>0/116 patients with microscopic haematuria</td>
<td>Includes children</td>
</tr>
<tr>
<td>Kisa E et al, 1986, USA</td>
<td>50 patients having IVP for blunt abdominal trauma</td>
<td>Retrospective diagnostic cohort study</td>
<td>Number with significant renal injury</td>
<td>0/43 patients with microscopic haematuria</td>
<td>Advocate imaging for patients whose microscopic haematuria does not resolve in 24 hours - rationale for this</td>
</tr>
<tr>
<td>Cass AS et al, 1986, USA</td>
<td>831 patients with haematuria following blunt trauma</td>
<td>Retrospective diagnostic cohort study</td>
<td>Number with significant renal injury</td>
<td>1/494 patients with microscopic haematuria and no shock</td>
<td></td>
</tr>
<tr>
<td>Hardeman SW et al, 1987, USA</td>
<td>506 patients with blunt trauma and haematuria</td>
<td>Prospective diagnostic cohort study</td>
<td>Number with significant renal injury</td>
<td>0/365 with microscopic haematuria, no shock and no major injuries</td>
<td></td>
</tr>
<tr>
<td>Thomasen RB et al, 1988, USA</td>
<td>102 patients undergoing IVP after blunt trauma</td>
<td>Retrospective diagnostic cohort study</td>
<td>Number with significant renal injury</td>
<td>0/76 patients with renal contusions</td>
<td></td>
</tr>
<tr>
<td>Eastham JA et al, 1992, USA</td>
<td>317 patients with blunt trauma, microscopic haematuria and no shock</td>
<td>Retrospective diagnostic cohort study</td>
<td>Number with significant renal injury</td>
<td>0/28 patients with renal contusions</td>
<td></td>
</tr>
<tr>
<td>McAndrew JD et al, 1994, USA</td>
<td>1103 patients undergoing radiographic evaluation of the renal tract for suspected renal trauma</td>
<td>Retrospective diagnostic cohort study</td>
<td>Number with significant renal injury</td>
<td>0/605 patients with blunt trauma, microscopic haematuria and no shock - 1 had a significant renal injury, but also associated lethal head injury</td>
<td></td>
</tr>
<tr>
<td>Moller CM et al, 1995, Denmark</td>
<td>114 patients suspected of having renal trauma</td>
<td>Retrospective diagnostic cohort study</td>
<td>Number with significant renal injury</td>
<td>0/65 patients with microscopic haematuria</td>
<td>Includes children</td>
</tr>
</tbody>
</table>

**How to remove a tick**

**Report by Stewart Teece, Clinical Research Fellow**

**Search checked by Ian Crawford, Clinical Research Fellow**

**Abstract**
A short cut review was carried out to establish whether there was any evidence to decide between the various described methods of tick removal. Altogether 40 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.

**Kisa E, Schenk WG. Indications for emergency intravenous pyelography in blunt abdominal trauma: a reappraisal. J Trauma 1986;26:1086–9.**


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>Needham GR, 1985, USA</td>
<td>29 American dog ticks and 22 lone star ticks attached to a female Dorset sheep</td>
<td>Experimental</td>
<td>Ease of removal and retained mouthparts. Testing with petroleum jelly, nail polish, 70% isopropyl alcohol and hot match (passive removal) and clockwise pull or straight pull with quick or steady even pressure (mechanical)</td>
<td>Failure of removal with passive methods. Removal with mechanical method steady even pressure most likely to give intact removal</td>
<td>Statistical significance not assessed</td>
</tr>
<tr>
<td>De Boer R and van den Bogard AE, 1993, Netherlands</td>
<td>Ixodes Ricinus attached to the skin of pigs and sheep</td>
<td>Experimental</td>
<td>Ease of removal, retained mouthparts. Testing with gasoline, nail polish and methylated spirit or by straight pull or rotation around axis</td>
<td>Failure of removal by chemical methods within 30 minutes. Straight pull less likely to leave mouthparts than rotation (0.01&lt;p&lt;0.02)</td>
<td></td>
</tr>
</tbody>
</table>

Comment(s)

Given that ticks have a respiratory rate of 3–15 breaths per hour suffocation would seem unlikely to work as the above studies showed, however anecdotal evidence suggests lignocaine gel may be efficacious in aiding removal.

CLINICAL BOTTOM LINE

Current evidence suggests that a straight slow method is best for removal without leaving the mouthparts.


Plaster or functional splint in gamekeepers thumb

Report by Steve Jones, Specialist Registrar
Search checked by Ian Crawford, Clinical Research Fellow

Abstract

A short cut review was carried out to establish whether a plaster of Paris or functional splint was better for treatment of ulnar collateral ligament rupture. Altogether 50 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 paper are tabulated. A clinical bottom line is stated.

Clinical scenario

A young poacher comes into the emergency department complaining of a sore thumb after a night pillaging the local squire’s estate. He smells strongly of game birds and clinically he has a rupture of the ulnar collateral ligament of his thumb. You wonder whether to plaster him or place him in a functional splint in the first instance?

Three part question

In a [rupture of the ulnar collateral ligament of the thumb] is [plaster immobilisation better than functional splinting of spica] at [reducing instability, arthrosis and pain]?

Search strategy

Medline 1966–04/02 using the OVID interface. {[(exp Collateral ligaments OR exp ligaments OR exp ligaments, articular OR ligament$.af) AND (exp Thumb OR thumb.af)} OR (gamekeeper$.af OR skier$.af)] AND [exp Immobilization OR exp Casts, surgical OR exp Splints OR plaster.af OR splint$.af OR spica.af] LIMIT to human AND English.

Search outcome

Altogether 50 papers were found of which only one was of sufficient quality for inclusion (see table 3).

Comment(s)

In this single study immobilisation of the thumb with a moveable splint was strongly preferred by the patients and the functional results of this technique were equal to plaster cast immobilisation after both surgical and non-surgical treatment.

CLINICAL BOTTOM LINE

Functional splintage should be used in this group of patients rather than plaster casts.


Perimortem caesarean section

Report by Russell Boyd, Consultant
Search checked by Stewart Teece, Clinical Research Fellow

Abstract

A short cut review was carried out to establish whether there is any evidence to show that perimortem caesarean section in...
Abstract
A short cut review was carried out to establish whether there is any evidence to show if topical antibiotic therapy reduces time to remission in acute bacterial conjunctivitis. Altogether 1231 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 paper are tabulated. A clinical bottom line is stated.

Clinical scenario
A 35 year old pregnant woman is brought into the resuscitation room of the emergency department in established cardiac arrest of three minutes duration. Full basic life support has been present since arrest; initial application of advanced protocols has not re-established circulation. You wonder whether emergency caesarean section could be life saving for either fetus or mother.

Three part question
In [a third trimester pregnant female in cardiac arrest] is [emergency caesarean section section effective] at [improving outcome for mother or fetus]?

Search strategy
Medline 1966–04/02 using the OVID interface. [(exp heart arrest OR exp cardiopulmonary resuscitation OR exp resuscitation OR cardiac arrest.mp OR resuscitation.mp OR perimortem.mp) AND (exp cesarean section OR cesarean.mp OR caesarean.mp OR cesarian.mp OR pregnant.$mp OR gravid.$mp OR uterine.mp)] LIMIT to human AND English Language

Search outcome
Altogether 1210 articles were identified, one of which was a summary of case reports up to 1985. This is summarised in table 4. Thirteen were case reports after 1985. The remaining 1196 reports were excluded as they were either case reports pre-1985 or failed to answer the three part question.

Comment(s)
Of the 15 cases reported after 1985 there were six maternal and 11 fetal survivors (including one set of twins), four of these cases had survival of both parties. Success rates seem high but reporting bias will be strongly influential in cases of this type, with only two of the 13 papers reporting loss of both mother and child in three cases. Although there is no quality evidence in this field, and there is no chance of controlled trials.


Topical antibiotics in acute bacterial conjunctivitis

Report by Ian Crawford, Clinical Research Fellow
Search checked by Don Othoro, Senior House Officer

Abstract
The meta-analysis indicates that acute bacterial conjunctivitis is frequently a self limiting condition, as early (days 2–5) clinical remission occurred in 64% (95% CI 57% to 71%) of those treated with placebo.

Clinical scenario
One evening after the emergency eye centre has closed you assess a patient and diagnose acute bacterial conjunctivitis. Your usual practice is to prescribe topical antibiotic therapy. Having recently attended a BestBETs course you wonder if this has been shown to reduce the time to clinical remission.

Three part question
In [patients with acute bacterial conjunctivitis] is [the use of topical antibiotic therapy better than placebo] at [reducing the time to clinical remission]?

Search strategy
Medline 1966–04/02 using the OVID interface, Cochrane Library Issue 1, 2002. Medline: (exp Chloramphenicol OR chloramphenicol.af OR exp Chlorotetracycline OR chlorotetracycline.af OR exp Ciprofloxacin OR ciprofloxacin.af OR exp Framycetin OR framycetin.af OR exp Fusidic acid OR fusidic acid.af OR exp Gentamicins OR gentamicin.af OR exp Neomycin OR neomycin.af OR exp Ofloxacin OR ofloxacin.af OR exp Polymyxin B OR polymyxin.af OR lomefloxacin.af OR propamidine.af OR exp Anti-Infective agents OR anti-infective agent$.af OR antib$.af) AND (exp Conjunctivitis OR conjunctivtis.af OR exp BACTERIAL) AND (ANTIBIOTICS) LIMIT to human AND English Language

Search outcome
Altogether 1231 papers were found of which three were relevant and had been meta-analysed by the Cochrane Eyes and Vision Group. This review was last updated on the 27 October 1999. No further relevant papers were identified after this date. This paper is shown in table 5.

Comment(s)
The meta-analysis indicates that acute bacterial conjunctivitis is frequently a self limiting condition, as early (days 2–5) clinical remission occurred in 64% (95% CI 57% to 71%) of those treated with placebo.

CLINICAL BOTTOM LINE
The use of topical antibiotic therapy does reduce the time to clinical remission in patients with acute bacterial conjunctivitis.

Bell’s palsy and acyclovir

Report by Man-Cheuk Yuen, Senior Medical Officer, Kwong Wah Hospital, Hong Kong

Search checked by Ian Crawford, Clinical Research Fellow

Abstract
A short cut review was carried out to establish whether acyclovir improves functional recovery in Bell’s palsy. Altogether 49 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 papers are tabulated. A clinical bottom line is stated.

Clinical scenario
A 45 year old man presents to the emergency department with a one day history of left side facial weakness. Physical examination confirms that the patient has an incomplete left sided Bell’s palsy. As prednisone has a limited role in improving the recovery of incomplete Bell’s palsy and medical literature postulates a viral aetiology in Bell’s palsy, you wonder whether acyclovir would improve the outcome for this patient.

Three part question
In [an adult patient with Bell’s palsy] does [acyclovir] improve [functional recovery]?

Search strategy

Search outcome
Altogether 49 papers were found of which two were relevant and had been included in a systematic review by the Cochrane Neuromuscular Disease Group. A meta-analysis was not performed, as the two studies were not directly compatible. This review was last updated on the 19 November 2001. No further relevant papers were identified after this date. These papers are shown in table 6.

Comment(s)
The results from the Adour trial suggest that treatment with acyclovir and prednisolone is more effective than treatment with prednisolone alone. However, the results from the De Diego trial suggest that treatment with prednisolone alone is more effective than treatment with acyclovir alone. Both studies are small and a significant number of patients were lost to follow up in each. A large PRCT with a real placebo control group is needed to clarify the effectiveness of acyclovir in the treatment of Bell’s palsy.

Clinical bottom line
Current evidence does not support the use of acyclovir alone in Bell’s palsy. The combination of acyclovir and prednisone may have a small benefit in the final functional recovery.


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>Sheikh A et al, 1999, UK</td>
<td>527 patients, from 3 studies, with acute bacterial conjunctivitis randomised to receive either topical antibiotic preparation or placebo</td>
<td>Meta-analysis</td>
<td>Early (days 2–5) clinical remission</td>
<td>RR 1.31 (99% CI 1.11 to 1.55)</td>
<td>Inclusion criteria of swab proven acute bacterial conjunctivitis in only 2 of the 3 studies</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Late (days 6–10) clinical remission</td>
<td>RR 1.27 (99% CI 0.92 to 1.74)</td>
<td>Different topical antibiotic preparations in each of the 3 studies</td>
</tr>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td>Selected specialist care patient populations</td>
</tr>
</tbody>
</table>

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>Adour KK et al, 1996, USA</td>
<td>119 patients presented within the first 72 hours Acyclovir and prednisolone v placebo and prednisolone Acyclovir 2000 mg per day for 10 days Prednisolone 1 mg/kg for 5 days tapered to 10 mg/day for next 5 days</td>
<td>PRCT Visual assessment of motor recovery by FPRP &amp; FPRI</td>
<td>Small treatment effect was demonstrated in the acyclovir and prednisolone group (p=0.04)</td>
<td>Small study 20% patients (16.8%) were lost to follow up</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Electrical testing</td>
<td>Acyclovir and prednisolone group had less partial nerve degeneration (p=0.05)</td>
<td>No intention to treat analysis</td>
</tr>
<tr>
<td>De Diego JJ et al, 1998, Spain</td>
<td>113 patients presenting within the first 96 hours Acyclovir alone v prednisolone alone Acyclovir 2400 mg per day for 10 days Prednisolone 1 mg/kg for 10 days tapered to zero over the next 6 days</td>
<td>PRCT Visual assessment of motor recovery by FPRP</td>
<td>Prednisone was beneficial (p=0.0338)</td>
<td>Small study 12 patients (10.6%) were lost to follow up</td>
<td>No real placebo control group</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Electrical testing</td>
<td>Prednisone had less degeneration of marginal branch of facial nerve (p=0.02)</td>
<td>No intention to treat analysis</td>
</tr>
</tbody>
</table>
Table 7

<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>Singer AJ et al, 1998, USA</td>
<td>68 adult patients requiring intravenous cannulation in the ED. Patients were randomised to receive tape stripping. All measurements made on 100 mm VAS. Scotch tape was applied and stripped 20 times to remove the stratum corneum.</td>
<td>PRCT</td>
<td>Pain during cannulation</td>
<td>Less with tape stripping 29.7 mm v 39 mm p = 0.017</td>
<td>Adult patients No blinding of person performing IV cannulation convenience sample rather than sequential</td>
</tr>
</tbody>
</table>

Search outcome

Altogether 47 papers were found of which one was relevant to the three part question. This paper is shown in table 7.

Comment(s)

The single study found shows a small benefit to tape stripping, but only involves adult patients undergoing venepuncture. It is debatable whether the small differences in VAS seen are clinically important (normally at least a change of 10 mm would be considered significant). In our practice EMLA is almost exclusively used in children. There is an amount of pain that is attributable to the tape stripping procedure, though this is a low value. However, applying the tape and stripping it 20 times is likely to be distressing for many children. This adult study does not investigate the probable difficulties in applying this technique in children. It is our perception that they would find the tape stripping distressing. For this reason we do not feel that it is possible to extrapolate the results of this study to children.

Clinical Bottom Line

Tape stripping the stratum corneum increases the effectiveness of EMLA in adults by a small degree. Its effectiveness in children is unknown.

Search checked by Simon Carley, Specialist Registrar

Staples or sutures for repair of scalp laceration in adults

Report by Kerstin Hogg, Clinical Research Fellow

Abstract

A short cut review was carried out to establish whether staples are better than sutures for scalp wound repair in adults. Altogether 42 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

An elderly lady is admitted to the emergency department after collapsing in the street. She has a 3 cm laceration in the left parietal area. Neurological examination and skull radiograph
are normal. You have examined and cleaned the wound, but wonder whether staples would be a better option than sutures for wound closure.

Three part question
In [adults with scalp laceration] are [staples better than sutures] for [ease of application and patient comfort]?

Search strategy
Medline 1966–04/02 using the OVID interface and Cochrane Library, Issue 1 2002. Medline: [(exp Sutures OR sutur$.mp OR exp Suture Techniques OR stitch$.mp) AND (exp Surgical Staplers OR exp Surgical Stapling OR stapl$.mp) AND (exp Scalp OR scalp.mp OR exp Craniofascial OR head.mp OR head injur$.mp)] Cochrane: (SURGICAL-STAPLERS*:ME) AND (SUTURES*:ME).

Search outcomes
Altogether 42 papers found of which 39 were irrelevant. One additional paper was identified from a reference (see table 8).

Comment(s)
There have been no large studies looking at the advantages of stapling wounds. It seems that stapling is cheaper than suturing, but the above studies have used a variety of different parameters to estimate cost. There are no large prospective, randomised studies targeting adults with scalp lacerations, assessing patient comfort, ease of application and risk of needlestick injury.

CLINICAL BOTTOM LINE
Staples are a quicker and cheaper method of scalp wound closure.

Staples or sutures in children with scalp lacerations

Report by Kerstin Hogg, Clinical Research Fellow
Search checked by Simon Carley, Specialist Registrar

Abstract
A short cut review was carried out to establish whether staples are better than sutures for scalp wound repair in children. Eight 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 paper are tabulated. A clinical bottom line is stated.

Clinical scenario
An 8 year old boy is brought to the emergency department by his parents, after tripping and hitting his head on the table

<table>
<thead>
<tr>
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<th>Key results</th>
<th>Study weaknesses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ritchie AJ and Rocke LG, 1989, Northern Ireland</td>
<td>200 patients attending A&amp;E over a 6 month period, with scalp lacerations</td>
<td>Prospective randomised study</td>
<td>Speed of repair</td>
<td>Average 49 sec to close stapled wound and 6 min 20 sec to close sutured wound</td>
<td>39% of patients missed the second wound review at 3 weeks</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Patient discomfort</td>
<td>Wound repair with staples was less painful than with sutures</td>
<td>Cost only takes into account price of material equipment</td>
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<td></td>
<td></td>
<td></td>
<td>Cost</td>
<td>£4.25 per stapled wound, £2 per sutured wound</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Wound complications</td>
<td>No difference in wound complications</td>
<td></td>
</tr>
<tr>
<td>Brickman KR and Lambert RW, 1989, USA</td>
<td>76 emergency patients with scalp, trunk, and extremity lacerations</td>
<td>Observational study looking at stapled wounds</td>
<td>Time efficiency</td>
<td>Most wounds were closed within 30 sec</td>
<td>67% of wounds were scalp lacerations</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Cosmesis</td>
<td>One scalp wound and one leg wound dehisced</td>
<td>17 patients lost at 7 day follow up</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Wound complications</td>
<td>Two stapled wounds dehisced</td>
<td>37% also contacted 6 months later</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Cost efficiency</td>
<td>Most wound closures with staples cost $5.11 compared with $9–$11 for suture closure</td>
<td>Paper does not use physicians time to calculate cost, nor does it include the cost of suture kits for stapling</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Patient satisfaction</td>
<td>None were dissatisfied</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Physician satisfaction</td>
<td>As a new technique they found it easy and rapid</td>
<td></td>
</tr>
<tr>
<td>MacGregor FB et al, 1989, Scotland</td>
<td>100 consecutive patients presenting to A&amp;E with superficial lacerations</td>
<td>Prospective randomised study</td>
<td>Speed of repair</td>
<td>Mean time per staple 18.6 sec, mean time per suture 124 sec</td>
<td>Not all lacerations involved the scalp</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Cost</td>
<td>5 staples £4.14, 5 sutures £2.36</td>
<td>Times included skin preparation</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Ease of removal</td>
<td>No difference</td>
<td>Physicians time not used to calculate costs</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Wound complications at time of removal</td>
<td>No difference</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Patient acceptability</td>
<td>More patients found staples acceptable. No local anaesthetic applied for stapling</td>
<td></td>
</tr>
<tr>
<td>Orlinsky M et al, 1995, USA</td>
<td>Patients presenting to the accident department with linear lacerations of the scalp, extremities and trunk</td>
<td>Prospective randomised study</td>
<td>Time efficiency</td>
<td>Average speed of stapling 8.3 seconds per cm, and for suturing 63.2 seconds per cm</td>
<td>Unable to report wound healing outcomes as follow up poor</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Cost of repair</td>
<td>Average cost of wound repair by staple, £7.08 if no suture kit used, and £17.69 if kit used. Average cost suture repair was £21.58</td>
<td></td>
</tr>
</tbody>
</table>

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>
</table>
edge. He has a 2 cm laceration over the occipital region. You examine the wound and wonder whether staples might be an easier alternative to sutures.

Three part question
In [children with scalp lacerations] are [staples better than sutures] for [ease of application and patient comfort]?

Search strategy
Medline 1966–04/02 using the OVID interface and Cochrane Library, Issue 1 2002. Medline: [(exp Sutures OR sutur$.mp OR exp Suture Techniques OR stitch$.mp) AND (exp Surgical Staplers OR exp Surgical Stapling OR stapl$.mp) AND (exp Scalp OR scalp.mp OR exp Craniocerebral Trauma OR head.mp OR head injur$.mp) AND (exp child OR exp adolescence OR exp child, abandoned OR exp child, exceptional OR exp child, hospitalized OR exp child, institutionalized OR exp child of impaired parents 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)]. Cochrane: SURGICAL-STAPLERS*:ME AND SUTURES*:ME AND CHILD*:ME

Search outcome
Medline: eight papers were found of which seven were irrelevant. The remaining paper was also found in Cochrane (three papers found, two irrelevant). The paper is shown in table 9.

Comment(s)
The evidence seems encouraging that staples are a cheaper, faster and effective way of closing scalp wounds in children, but larger studies are required to confirm this.

CLINICAL BOTTOM LINE
Staples may turn out to be more effective at scalp wound closure in children, but further research is awaited.


Table 9

<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>Kanegaye JT et al, 1997, USA</td>
<td>88 patients age 13 months to 16 years, attending emergency department with scalp lacerations</td>
<td>Prospective randomised study</td>
<td>Patient pain (self reported)</td>
<td>No statistical difference between scores.</td>
<td>No fixed protocol for local anaesthetic administration</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Patient restraint</td>
<td>Some form of immobilisation used in 45% staple group and 60% suture group.</td>
<td>Costs assume repair by a physician</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Speed of repair</td>
<td>Staples were 6 times faster than sutures per wound, and 8 times faster per cm wound repaired. Taking into account skin preparation time, stapling was twice as fast. Fellows were one and a half times faster at stapling than residents.</td>
<td>Group size too small to effectively establish rate of wound complications</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Parental satisfaction</td>
<td>No difference between groups</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Cost of repair</td>
<td>Staples cost 39% less than sutures per wound closure, even when paying a fellow rather than a resident.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Wound complications at 7 days</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Needlestick injuries</td>
<td>One glove punctured during staple repair, and two needles lost during suturing.</td>
<td></td>
</tr>
</tbody>
</table>

Tangential views or computed tomography in suspected depressed skull fracture

Report by Magnus Harrison, Specialist Registrar

Search checked by Steve Jones, Specialist Registrar

Abstract
A short cut review was carried out to establish whether CT scans are better than tangential skull radiographs at detecting depressed skull fractures. No papers answering this question were found using the reported search.

Clinical scenario
A 35 year old man alleges that he has been assaulted. He claims that he was hit on the head with a hammer. He is only complaining of pain around the site of the injury. On examination there is haematoma present, but no laceration. Standard skull views reveal no bony injury. You suspect a depressed skull fracture and wonder whether a tangential radiograph of the site of the injury, or a CT scan would be better able to detect it.

Three part question
In [patients presenting with head injury and suspicion of depressed skull fracture] is [tangential radiograph or CT scan better] at [detecting depressed skull fracture].

Search strategy
Medline 1966–04/02 using the OVID interface. [exp skull fractures OR exp skull fracture, depressed OR (skull.mp OR cranium.mp OR calvarium.mp) AND (fracture.mp AND depressed.mp)] AND [exp x-rays OR x-rays.mp OR roentgenogram.mp OR tangential.mp OR oblique.mp] AND [exp tomography, x-ray computed OR ct.mp OR tomography.mp OR ct scan$.mp] LIMIT to human AND English.

www.emjonline.com
Search outcome
Altogether 40 papers were found. None of the papers answered the three part question.

Comment(s)
Intuitively it would seem that CT scan is the best method available to investigate such injuries. However, there is no evidence to show that it is better than tangential skull views.

CLINICAL BOTTOM LINE
Local neurosurgical advice should be followed.