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.1 Each BET has been constructed in the four stages that have been described elsewhere.2 The BETs shown here together with those published previously and those currently under construction can be seen at http://www.bestbets.org.3 The four topics covered in this issue of the journal are:

- Use of the McCoy laryngoscope in patients with suspected cervical spine fracture
- White cell count and diagnosing appendicitis in pregnancy
- Oral acyclovir in acute cutaneous herpes zoster
- Urinary trypsinogen to rule out acute pancreatitis in patients with abdominal pain


Use of the McCoy laryngoscope in patients with suspected cervical spine fracture
Report by Simon Carley, Specialist Registrar
Search checked by John Butler, Specialist Registrar

Clinical scenario
A 24 year old man is brought to the emergency department after a fall. He has reduced conscious level and requires intubation to secure his airway. As a cervical injury cannot be excluded you attempt intubation in the neutral position with manual in-line cervical spine stabilisation. At laryngoscopy using a size 4 Macintosh blade you are unable to visualise the cords (grade 3 view) but manage to intubate the patient using a gum elastic bougie. Later, when discussing the case with an anaesthetist, you hear that the McCoy laryngoscope is said to give a better view than a conventional laryngoscope when patients are intubated in the neutral position. You

<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>Laurent SC et al, 1996, UK</td>
<td>167 elective patients intubated in the neutral c-spine position. Each patient had laryngoscopy performed with both Macintosh and McCoy (both size 3 blades)</td>
<td>Controlled clinical trial</td>
<td>Cormack view at laryngoscopy Number of patients whose Cormack score improved</td>
<td>Grade 3 or 4 view in 33% of cases with Macintosh v 5% with McCoy (p&lt;0.001). View improved by one or more Cormack grades in 57% of patients using McCoy laryngoscope</td>
<td>Elective setting. Only a size 3 blade used. There were no grade 4 views in this study.</td>
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<tr>
<td>Uchida T et al, 1997, Canada</td>
<td>50 female patients undergoing elective surgery, patients were kept in the neutral position by an assistant using in-line cervical immobilisation. Either a size 3 Macintosh or a size 3 McCoy blade was used</td>
<td>Controlled clinical trial</td>
<td>Percentage of grade 3 or 4 views at laryngoscopy Number of patients in whom view improved with McCoy</td>
<td>76% with Macintosh v 16% with McCoy blade (p&lt;0.01) View was improved in 74% of cases using Cormack score. The 2 patients scoring grade 4 with the Macintosh did not improve with the McCoy</td>
<td>Only female patients studied. Elective setting. All patients were first examined using the Macintosh before using the McCoy.</td>
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</table>
wonder is there is any evidence to back this up before you go and buy some more equipment for the emergency department.

Three part question
In [patients requiring intubation with the neck in the neutral position] is [a McCoy laryngoscope better than an Macintosh laryngoscope] at [optimising the view of the laryngeal inlet]?

Search strategy
Medline 1966–06/00 using the OVID interface. ({McCoy.mp} AND {exp intubation, intratracheal OR exp laryngoscopy OR “laryngoscope”.mp}) LIMIT to human AND english.

Search outcome
Altogether 27 papers found of which 25 were irrelevant or of insufficient quality. The remaining two papers are shown in the table 1.

Comments
Failure to intubate a trauma patient because the larynx cannot be visualised is a feared scenario, yet in-line cervical stabilisation makes the view at laryngoscopy difficult. These studies demonstrate a clear advantage to the McCoy blade as compared with the Macintosh blade. In particular the incidence of grade 3 views markedly reduces with the McCoy blade. Both studies fail to assess the ability to actually intubate the patient, rather they just analyse the view of the cords. However, visualising the cords is a useful proxy marker for ease of intubation.

Clinical bottom line
A McCoy laryngoscope is a useful aid in difficult intubation, and should be available when rapid sequence induction is attempted in the patient in whom a cervical spine injury is suspected.

White cell count and diagnosing appendicitis in pregnancy
Report by Rob Williams, Clinical Fellow
Search checked by Kevin Mackway-Jones, Consultant

Clinical scenario
A 27 year old woman who is 14 weeks pregnant, presents to the emergency department with the symptoms and signs of appendicitis. You refer the case to the acute surgical team who ask you to obtain a white cell count. You wonder whether this test has any value in this situation.

Three part question
In [pregnant women with a clinical diagnosis of appendicitis] is [a raised white cell count] useful in [diagnosis]?

Search strategy
Medline 1966–06/00 using the OVID interface. ({exp appendicitis OR appendicitis.mp} AND {exp leukocyte count OR leukocyte count$.mp OR neutrophil count$.mp OR white cell count$.mp} AND {exp pregnancy OR pregnancy.mp}) LIMIT to human AND english.

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

Comments
The only available studies deal with the wrong spectrum of patients. The women included all underwent appendicectomy; this is a selected sample of pregnant women presenting to emergency departments with the clinical signs and symptoms of appendicitis.

Clinical bottom line
There is no evidence to support the use of isolated white cell counts in the diagnosis of acute appendicitis in pregnant women.

Table 2

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<th>Study weaknesses</th>
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<tr>
<td>Doberneck RC, 1985, USA</td>
<td>29 pregnant women undergoing appendicectomy.</td>
<td>Retrospective survey</td>
<td>WCC &gt;10 000</td>
<td>Sensitivity 83%  Specificity 50%  Positive likelihood ratio 1.28  Negative likelihood ratio 0.45</td>
<td>Retrospective selection bias. Women undergoing appendicectomy only. Small numbers. Incomplete data.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>WCC &gt;15 000</td>
<td>Sensitivity 50%  Specificity 89%  Positive likelihood ratio 4.5  Negative likelihood ratio 0.56</td>
<td></td>
</tr>
<tr>
<td>Anderson B and Nielsen TF, 1999, Sweden</td>
<td>56 pregnant women undergoing appendicectomy.</td>
<td>Retrospective survey</td>
<td>WCC &gt;16 000</td>
<td>Sensitivity 60%  Specificity 5%  Positive likelihood ratio 0.63  Negative likelihood ratio 8.4</td>
<td>Retrospective selection bias. Women undergoing appendicectomy only. Small numbers. Incomplete data.</td>
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Oral acyclovir in acute cutaneous herpes zoster

Report by Polly Terry, Specialist Registrar
Search checked by Susan Buttress, Research Physiotherapist

Clinical scenario
A 56 year old immunocompetent man presents to the emergency department at 10 pm on a Saturday night with acute shingles. You know acyclovir is effective but wonder how quickly it needs to be started.

Three part question
In [immunocompetent adults with acute shingles] is [early acyclovir better than late acyclovir] at [promoting rash healing and minimising the painful period]?

Search strategy
Medline 1966–06/00 using the OVID interface. ([exp herpes zoster OR herpes zoster.mp OR shingles] AND [exp acyclovir OR acyclovir.mp OR exp antiviral agents OR antiviral agent$.mp OR anti viral.mp OR antiviral.mp]) AND maximally sensitive RCT filter LIMIT to human AND english.

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<tr>
<td>Jackson JL et al, 1997, USA</td>
<td>5 placebo controlled randomised clinical trials. All trials used acyclovir 800 mg 5 times daily within 72 h of onset</td>
<td>Meta-analysis</td>
<td>Pain at 6 months</td>
<td>Summary odds ratio 0.84 (0.36, 0.81) in patients treated with acyclovir</td>
<td></td>
</tr>
<tr>
<td>Whitley RJ et al, 1998, USA</td>
<td>6 randomised controlled double blind studies</td>
<td>Meta-analysis</td>
<td>Factors influencing duration of pain</td>
<td>Age, prodromal pain, acute pain intensity</td>
<td>No separate data for trials 1–3.</td>
</tr>
<tr>
<td>Wood MJ et al, 1998, UK</td>
<td>3 placebo controlled studies or oral acyclovir. All trials used acyclovir 800 mg 5 times daily. Early (&lt;48 h) v late (48–72 h) treatment</td>
<td>Meta-analysis</td>
<td>Resolution of zoster related pain in:</td>
<td>Hazard ratio 1.79 (1.43, 2.39)</td>
<td></td>
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</table>

Comments
All three meta-analyses used three core papers—but there was enormous variation in selection of the other papers. Thus selection bias may have occurred.

Clinical bottom line
Early oral acyclovir (less than 48 hours after onset of rash) will significantly shorten the duration of herpes related pain in shingles.

Table 3

Urinary trypsinogen to rule out acute pancreatitis in patients with abdominal pain

Report by John Butler, Specialist Registrar
Search checked by Magnus Harrison, Research Fellow

Clinical scenario
A 45 year old woman attends the emergency department with a four hour history of acute epigastric pain. She has a history of alcohol use. Examination reveals epigastric tenderness but no peritonism. You consider pancreatitis and wonder whether a single urinary trypsinogen measurement can be used to rule out this diagnosis.

Three part question
In [patients with abdominal pain and a suspicion of pancreatitis] can [a urinary trypsinogen test] [rule out pancreatitis]?

Search strategy
Medline 1966–06/00 using the OVID interface. ([exp abdominal pain OR abdominal pain.mp OR exp pancreatitis OR exp pancreatitis, acute necrotising OR exp pancreatitis, alcoholic OR pancreatitis.mp] AND exp trypsin OR exp trypsinogen OR trypsin$.mp OR trypsinogen$.mp)) AND sensitivity.tw LIMIT to human AND english.

Search outcome
Altogether 74 papers found of which 71 were irrelevant or of insufficient quality for inclusion. The remaining three papers are shown in table 4.

Comments
The sensitivity of urinary trypsinogen is around 95%. Its clinical efficacy is much higher than the tests that are commonly used.
Clinical bottom line
Urinary trypsinogen can be used as a sensitive tool to exclude pancreatitis in emergency departments.


### Table 4

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</tr>
</thead>
<tbody>
<tr>
<td>Kemppainen EA <em>et al</em>, 1997, Finland</td>
<td>500 consecutive patients attending an emergency department with abdominal pain.</td>
<td>Diagnostic cohort</td>
<td>Urinary trypsinogen (50 ng/ml)</td>
<td>Sensitivity 94% (92–96%) Specificity 95% (93–97%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Urinary trypsinogen vs serum amylase vs urinary amylase</td>
<td></td>
<td>Serum amylase (300 IU)</td>
<td>Sensitivity 85% Specificity 91%</td>
<td></td>
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<tr>
<td></td>
<td>Urinary trypsinogen vs serum amylase</td>
<td></td>
<td>Urinary amylase (2000 IU/l)</td>
<td>Sensitivity 83% Specificity 88%</td>
<td></td>
</tr>
<tr>
<td>Tenner S <em>et al</em>, 1997, USA</td>
<td>189 patients. 139 with pancreatitis, 50 without.</td>
<td>Diagnostic cohort</td>
<td>Urinary trypsinogen (10 ng/ml)</td>
<td>NPV 100%</td>
<td></td>
</tr>
<tr>
<td>Kylanpaa-Back ML <em>et al</em>, 2000, Finland</td>
<td>525 consecutive patients with abdominal pain presenting to 2 emergency departments.</td>
<td>Diagnostic test study</td>
<td>Diagnosis of pancreatitis</td>
<td>Sensitivity 96% (94–97%) Specificity 92% (90–95%)</td>
<td>Gold standard was serum and urinary amylase, clinical features and CT.</td>
</tr>
</tbody>
</table>