

diagnostic test under consideration. Despite this weakness all the above studies except one reported sensitivities below 95%, especially in alcohol related pancreatitis cases.

#### ► CLINICAL BOTTOM LINE

In patients presenting to the emergency department with acute abdominal pain a normal serum amylase concentration is not sufficiently sensitive to rule out the diagnosis of acute pancreatitis.

**Steinberg WM**, Goldstein SS, Davis ND, *et al.* Diagnostic assays in acute pancreatitis. *Ann Intern Med* 1985;102:576–80.

**Lin XZ**, Wang SS, Tsai YT, *et al.* Serum amylase, isoamylase, and lipase in the acute abdomen. Their diagnostic value for acute pancreatitis. *J Clin Gastroenterol* 1989;11:47–52.

**Clavien PA**, Robert J, Meyer P, *et al.* Acute pancreatitis and normoamylasemia. Not an uncommon combination. *Ann Surg* 1989;210:614–20.

**Winslet M**, Hall C, London NJ, *et al.* Relation of diagnostic serum amylase levels to aetiology and severity of acute pancreatitis. *Gut* 1992;33:982–6.

## Ultrasonic guidance and the complications of central line placement in the emergency department

### Report by Joel Dunning, *RCS Research Fellow* Checked by James Williamson, *Clinical Fellow*

#### Abstract

A short cut review was carried out to establish whether ultrasonic guidance reduces the complication rate during central line placement in the emergency department. Altogether 349 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

You are evaluating a 90 kg acutely dyspnoeic diabetic woman in the emergency department. She has a history of left ventricular failure and was an inpatient only two weeks ago with a small myocardial infarction. Her BP is only 90/50 and you feel that she is a high risk patient with poor peripheral venous access who may need high dependency care possibly with inotropes, and you therefore decide that a central line would be of great benefit. Your department has just bought a handheld USS probe and you wonder whether it is worth having a go with this rather than your usual blind landmark technique.

Table 5

Author, date and country	Patient group	Study type (level of evidence)	Outcomes	Key results	Study weaknesses
Randolph AG <i>et al.</i> , 1996, USA	Eight randomised controlled studies identified from Medline search from 1966 to 1995 Studies were using operators with low experience but no studies were in the emergency department	Meta-analysis	Meta-analysis of the relative risk of various clinical variables	Central line placement failure 0.32 (0.18 to 0.55)  Complications during catheter placement 0.22 (0.10 to 0.45) Need for multiple catheter placement attempts 0.60 (0.45 to 0.79)	Medline search only, no systematic review  Poor search strategy
NICE guidelines, 2002, UK	Systematic review of the literature  20 RCTs evaluating ultrasound guidance for central line placement found  Only two were performed in the emergency room setting, with seven in ITU, and the remainder in elective scenarios  Only four studies were clearly performed by non-anaesthetists	Systematic review and meta analysis	Recommendations  Meta-analysis of relative risks of various clinical outcome measures  Cost effectiveness	Use of 2-D USS should be considered in most clinical situations where a central line is necessary electively or in an emergency No. failed catheter placements RR: 0.16 (0.09 to 0.3) No. complications odds: 0.36 (0.17 to 0.36) risk of failure RR: 0.59 (0.39 to 0.88) Number of fewer attempts RR 1.62 (2.57 to 0.67) Number of seconds saved 76 (96–63) Number of arterial punctures saved 90 per 1000 patients The extra cost is likely to be about £10 patient, although the machines cost £7000–£15000 initially	Grades of recommendation not provided  Few studies on non-anaesthetist personnel in the Emergency department
Miller AH <i>et al.</i> , 2002, USA	122 emergency medical patients designated as "difficult insertions" randomised to the Landmark technique (n=71) or 2-D USS guidance technique (n=51) Difficult patients defined as peripheral vascular disease, coagulopathy, obesity, abnormal anatomy, or history of intravenous drug misuse	Cohort study	Time from needle touching skin to successful flashback  Number of attempts  Complications	Landmark group 463 s +/-627 s SS group 93 s +/-176 s p<0.0001  Landmark group 3.54 +/-2.7 USS group 1.55 +/-1 p<0.0001 Landmark group 14% USS group 12% p=0.780	The insertion time may only represent a small amount of the total time taken to set up an USS guided central line insertion

**Three part question**

In [patients in the emergency department requiring a central line] is [USS guidance better than blind landmark techniques] at [reducing the complications of insertion]?

**Search strategy**

Medline 1966-07/03 using the OVID interface. [(exp Ultrasonography/ OR ultrasound.mp) AND (exp Catheterization, Central Venous/ OR central venous catheter.mp OR central line.mp)] LIMIT to human AND English

**Search outcome**

Altogether 349 papers were found of which two represented the best evidence. This included a meta-analysis and an additional paper. In addition a second meta-analysis not indexed on Medline was identified by cross referencing (table 5).

**Comment(s)**

Two meta-analyses were identified in this area and only one additional paper could be found that neither meta-analysis included. Both meta-analyses provide strong evidence that USS guided placement significantly reduces complications during catheter placement, number of attempts at insertion and reduction in the number of attempts at insertion for both neck and femoral line insertion. In addition and the NICE meta-analysis provides evidence that insertion time is quicker although this evidence is less convincing. NICE also imply that if used regularly the cost implication could be as little as £10 per patient although they acknowledge a projected £29

million cost for initial NHS implementation for equipment and training.

**► CLINICAL BOTTOM LINE**

There is good evidence that USS guided placement of central lines reduces the complication rate associated with this procedure.

**Randolph AG**, Cook DJ, Gonzales CA, *et al.* Ultrasound guidance for placement of central venous catheters: a meta-analysis of the literature. *Crit Care Med* 1996;**24**:2053–8.

**National Institute for Clinical Excellence.** Guidance on the use of ultrasound locating devices for placing central venous catheters. *Technology appraisal guidance no 49* 2002 <http://www.org.uk/cat.asp?c=36752> (accessed 3 Feb 2003).

**Miller AH**, Roth BA, Mills TJ, *et al.* Ultrasound guidance versus the landmark technique for the placement of central venous catheters in the emergency department. *Acad Emerg Med* 2002;**9**:800–5.

## The utility of the tongue blade test for the diagnosis of mandibular fracture

**Report by Rashmi Malhotra, Medical Student**  
**Checked by Joel Dunning, RCS Research Fellow**  
**Abstract**

A short cut review was carried out to establish whether the tongue blade test is useful in the clinical assessment of patients with mandibular trauma. Altogether 269 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

**Table 6**

Author, date and country	Patient group	Study type (level of evidence)	Outcomes	Key results	Study weaknesses
Alonso LL and Thomas TB, 1995, USA	110 consecutive patients in the emergency department with jaw pain  Exclusion criteria: patients unable to cooperate because of age, language barrier, inability to open mouth because of pain, intoxication or head injury	Diagnostic study	Patient ability to grasp a tongue blade/depressor between his teeth and hold the blade against a twisting motion, with the ability to crack the tongue blade on both sides defined a negative test Inability to crack tongue blade on both sides of the mandible defined positive test	Sensitivity of tongue blade test: 45 positive of 47 fractures, sensitivity 95.7%, CI (85.5 to 99.5%)  Specificity of tongue blade test: 23 positive TBT of 63 non-fractures, specificity 63.5%, CI (50.4 to 75.3%)	No sample size estimates—sample used too small  “Gold standard” radiologist interpretation sensitivity measured in an other study in this hospital and was found to be only 95.5% Single radiologist to report radiographs—no double reporting
Robert A <i>et al</i> , 1998, USA	119 patients with jaw pain after trauma presenting at the emergency department  Exclusion criteria: airway compromise, inability to perform or cooperate with clinical examination, edentulousness	Diagnostic study	Patient ability to grasp a tongue blade/depressor between his teeth by and then to hold the blade against mild resistance by the examiner  Inability to hold tongue blade against resistance on either hemimandible defined as a positive test	Sensitivity of tongue blade test: 42 positive of 44 fractures, sensitivity 95%  Specificity of tongue blade rest: 25 positive TBT of 75 non-fractures, specificity 67%	No OPG despite panoramic series known to be more sensitive than mandibular series in detecting mandibular fracture Single radiologist to report radiographs—no double reporting No interobserver variability measurements No CIs calculated Incorrect use of $\chi^2$ test—number too small should have used Fisher’s exact test No sample size estimates—sample used too small