BEST EVIDENCE TOPIC REPORTS

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

Edited by K Mackway-Jones

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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 Six BETs are included in this issue of the journal.

- ▶ Reimplantation of the nail root in fingertip crush injuries in children
- ▶ Antibiotics in non-venomous snakebite
- ▶ Intra-articular lidocaine for acute anterior shoulder dislocation reduction
- ▶ Propofol for resistant status epilepticus
- ▶ Regional nerve block in fractured neck of femur
- ▶ Bronchodilator delivery in acute severe asthma in adults

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1 Carley SD, Mackway-Jones K, Jones A, *et al.* Moving towards evidence based emergency medicine: use of a structured critical appraisal journal club. *J Accid Emerg Med* 1998;**15**:220–2.

2 Mackway-Jones K, Carley SD, Morton RJ, *et al.* The best evidence topic report: a modified CAT for summarising the available evidence in emergency medicine. *J Accid Emerg Med* 1998;**15**:222–6.

3 Mackway-Jones K, Carley SD. *bestbets.org*: Odds on favourite for evidence in emergency medicine reaches the worldwide web. *J Accid Emerg Med* 2000;**17**:235–6.

Reimplantation of the nail root in fingertip crush injuries in children

Report by Russell Boyd, *Consultant*

Checked by Carole Libetta, *Consultant*

Abstract

A short cut review was carried out to establish whether reimplantation of the nail improved cosmetic outcome after crush injury to the fingertip in children. Altogether 35 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 2 year old child presents to the emergency department with a crush injury to the left index finger tip. The fingernail has been avulsed from the proximal nail fold. You wonder if surgical reimplantation of the nail root into the proximal fold will produce a better cosmetic result.

Three part question

In [children with fingertip injuries to the nail root] does [surgical reimplantation] improve [cosmetic outcome]?

Search strategy

Medline 1966 to 12/01 using the OVID interface. [(exp adolescence OR exp child OR exp child of impaired parents OR exp child, abandoned OR exp child, exceptional OR exp child, hospitalized OR exp child, institutionalized 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) AND exp finger injuries AND (fingertip.mp OR finger tip.mp OR nail\$.mp) AND (exp replantation OR replantation.mp OR reimplantation.mp OR replace\$.mp OR repair.mp)] LIMIT to human AND English.

Search outcome

Altogether 35 papers were identified, of which one was deemed relevant for inclusion (table 1).

Comment(s)

The outcome was anecdotally related by the authors to the degree of crush injury to proximal nail fold but no evidence was presented to support this. This is a poor study and more research is needed.

CLINICAL BOTTOM LINE

No good evidence exists to guide current decisions. Local guidelines should be followed.

O'Shaughnessy M, McCann J, O'Connor TP, *et al.* Nail re-growth in fingertip injuries. *Irish Med J* 1990;**83**:136–7.

Table 1

Author, date, and country	Patient group	Study type	Outcomes	Key results	Study weaknesses
O'Shaughnessy M <i>et al.</i> , 1990, Ireland	64 finger tip injuries in patients aged 1–81 years	Retrospective	Cosmetic appearance	No difference	Objective scoring mechanism lacking
	10 with nails v 54 without	observational	Nail length	No difference	Included both adults and children

Table 2

Author, date and country	Patient group	Study type	Outcomes	Key results	Study weaknesses
Weed HG, 1993, USA	72 consecutive children and adults with non-venomated snake wounds calling a poisons centre. None of the patients received antibiotics	Observational	Presence of wound infection	No wound infection identified	14% applied topical antibiotics No definition of wound infection No control group
Blaylock RS, 1999, South Africa	363 patients presenting with snake bites—both venomous (88%) and non-venomous (12%) Antibiotics given if necrosis present (15.2%)	Observational	Presence of wound infection	No infections in patients not given antibiotics	Not randomised Antibiotics given on clinical grounds (presence of necrosis) Very little raw result data provided

Antibiotics in non-venomous snakebite

Report by Polly Terry, *Specialist Registrar*

Checked by Kevin Mackway-Jones, *Professor*

Abstract

A short cut review was carried out to establish whether prophylactic antibiotics reduced the incidence of infection after non-venomous snake bite. Altogether 60 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 26 year old man attends the emergency department having been bitten on his right hand 30 minutes previously by his pet—a non-venomous snake. Examination reveals localised swelling and oedema of his right hand and forearm, he is systemically well, has no relevant previous medical history and is fully antitetanus immunised. You know there is the potential for infection from the snakes fangs and oropharynx, as well as contamination from the victim's skin and clothing. You thoroughly clean the wound with local wound toilet, and are happy that there is no fang left in situ. You wonder if prophylactic antibiotics are indicated to reduce the risk of infection.

Three part question

In [fit and well adults who have been bitten by a non venomous snake] do [prophylactic antibiotics] reduce [the incidence of infection]?

Search strategy

Medline 1966–12/01 using the OVID interface. [(exp snake bites OR snake bite\$.mp) AND (exp antibiotics OR antibiotics.mp OR antibiotic\$.mp)] LIMIT to human AND English.

Search outcome

Altogether 60 papers of which two were relevant (table 2).

Comment(s)

While many studies have identified the variety of potential pathogens from snakebite, few have looked at the role of prophylactic antibiotics and those available are of poor quality. It is interesting to note the low incidence of infection associated with snakebites irrespective of antibiotic treatment or not. Given the low event rate for infection, trials involving larger numbers would need to be undertaken.

► CLINICAL BOTTOM LINE

Prophylactic antibiotics are not indicated in the routine treatment of patients with snakebites from non-venomous snakes if no necrosis is present.

Weed HG. Nonvenomous snakebite in Massachusetts: prophylactic antibiotics are unnecessary. *Ann Emerg Med* 1993;22:220–4.

Blaylock RS. Antibiotic use and infection in snakebite victims. *South African Med J* 1999;89:874–6.

Intra-articular lidocaine for acute anterior shoulder dislocation reduction

Report by S R Dhinakharan, *Clinical Fellow*

Checked by Angaj Ghosh, *Senior Clinical Fellow*

Abstract

A short cut review was carried out to establish how intra-articular lidocaine compared with intravenous analgesia and sedation during reduction of anterior shoulder dislocations. Altogether 146 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 middle aged man attends the emergency department having sustained an acute primary anterior shoulder dislocation during a fall. It is impossible to obtain peripheral venous access and you are not able to get him to breathe entonox. You are aware that shoulder dislocations can be reduced with intra-articular lidocaine (IAL). You wonder if IAL is as effective as intravenous analgesia and sedation (IVAS).

Three part question

In [patients with acute traumatic anterior shoulder dislocation] is [intra-articular lidocaine as effective as intravenous analgesia and sedation] at [facilitating reduction and easing pain associated with reduction]?

Search strategy

Medline 1966–12/01 using the Ovid interface. [exp shoulder dislocation OR shoulder dislocation.mp OR “dislocated shoulder”.mp] AND [exp anesthesia, intravenous OR exp anesthetics, intravenous OR “intravenous anaesthesia”.mp OR exp analgesia OR exp conscious sedation OR exp diazepam OR exp hypnotics and sedatives OR exp midazolam OR exp sedatives, nonbarbiturate OR sedation.mp OR exp narcotics OR narcotics.mp OR exp morphine OR morphine.mp OR exp meperidine OR meperidine.mp OR exp pethidine OR pethidine.mp OR exp lidocaine OR “lidocaine”.mp OR “lignocaine”.mp OR exp injections, intra-articular OR exp joint diseases OR intra-articular.mp OR exp anesthetics OR exp anesthetics, local OR anesthetics.mp] AND maximally sensitive RCT filter. LIMIT to human AND English.

Search outcome

Altogether 146 papers were found, of which three were relevant (table 3).

Comment(s)

All studies were small and therefore underpowered. Larger studies are therefore needed.

Table 3

Author, date and country	Patient group	Study type (level of evidence)	Outcomes	Key results	Study weaknesses
Suder PA <i>et al</i> , 1995, Denmark	52 patients with secondary traumatic shoulder dislocation patients IAL (26) v IVAS (26)	PRCT	Result of reduction Mean time Subjective evaluation Pain	No significant difference ($p=0.19$) $16.1 + 3.5$ v $4.7 + 2.9$ ($p=0.001$) Insignificant difference ($p=0.19$) Insignificant difference ($p=0.08$)	Small size
Matthews DE and Roberts T, 1995, USA	30 consecutive patients presenting to the emergency department with acute anterior shoulder dislocation IAL (15) v IVAS (15)	PRCT	Time to reduction. Difficulty of reduction. Subjective pain Complications Time in emergency department	No statistically significant difference No complications Significant reduction in the IAL group	Small size Varied reduction techniques Statistical methods not described
Kosnik J <i>et al</i> , 1999, USA	49 patients presenting to the emergency department with acute anterior shoulder dislocation IAL (29) v IVAS (20)	PRCT	Success rate Ease of reduction (SD) Pain score (SD)	20/20 for IVAS v 24/29 for IAL ($p=0.07$) 3.32 (2.36) for IVAS v 4.45 (2.46) for IAL ($p=0.12$) 3.95 (2.39) for IVAS v 4.90 (2.34) for IAL ($p=0.18$)	Small sample size Varied physician experience Varied reduction techniques

► CLINICAL BOTTOM LINE

Where intravenous analgesia and sedation needs to be avoided, intra-articular lidocaine should be the analgesic method of choice for reducing shoulder dislocations.

Suder PA, Mikkelsen JB, Hougaard K, *et al*. Reduction of traumatic secondary shoulder dislocations with lidocaine. *Arch Orthop Trauma Surg* 1995;114:233–6.

Matthews DE, Roberts T. Intraarticular lidocaine versus intravenous analgesic for reduction of acute anterior shoulder dislocations. A prospective randomized study. *Am J Sports Med* 1995;23:54–8.

Kosnik J, Shamsa F, Raphael E, *et al*. Anesthetic methods for reduction of acute shoulder dislocations: a prospective randomized study comparing intraarticular lidocaine with intravenous analgesia and sedation. *Am J Emerg Med* 1999;17:566–70.

Propofol for resistant status epilepticus

Report by Simon Carley, Specialist Registrar

Checked by Ian Crawford, Research Fellow

Abstract

A short cut review was carried out to establish whether propofol is effective at stopping fitting in resistant status epilepticus. Altogether 24 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 presents to the emergency department in status epilepticus. Initial treatment with benzodiazepines and phenytoin is unsuccessful. He is intubated and ventilated using thiopentone and suxamethonium. Ten minutes later he starts to fit again. The anaesthetist suggests that propofol may help but you have heard that propofol can increase EEG activity. You wonder whether this is an appropriate drug to use.

Three part question

In [patients in resistant status epilepticus] is [propofol] effective at [reducing seizure activity]?

Search strategy

Medline 1966–12/01 using the OVID interface. [exp propofol OR propofol.mp OR diprivan.mp] AND [exp status epilepticus OR status epilepticus.mp] LIMIT to human, English, abstracts.

Search outcome

Altogether 24 papers of which six included data on patients relevant to the clinical question (table 4).

Table 4

Author, date and country	Patient group	Study type (level of evidence)	Outcomes	Key results	Study weaknesses
Mackenzie SJ <i>et al</i> 1990 Scotland	2 patients with RSE. Standard treatment unsuccessful	Case series	Observation of seizure activity	Propofol stopped seizure activity clinically and on EEG	Case series
Campostrini R <i>et al</i> 1991 Italy	4 patients on ICU with RSE	Case series	Observation of seizure activity	Propofol infusion stopped apparent seizure activity	Case series
Borgeat A <i>et al</i> 1994 Switzerland	Adult OD patient. Propofol was given to suppress EEG activity	Case report	Observation of EEG activity	Propofol appeared to suppress EEG seizure activity	Case report
Kuisma M and Roine RO 1995 Finland	8 adult patients in prehospital care with RSE. All patients were intubated and ventilated. All received propofol boluses of 100–200 mg.	Case series	Success at terminating seizures	All patients stopped RSE with propofol	Case series. Not clear if patients intubated before or after propofol usage. This could be a result of the use of propofol.
Harrison AM <i>et al</i> 1998 USA	9/12 child with hereditary fructose intolerance in RSE	Case report	Observation	RSE stopped on infusion of 3 mg/kg propofol	Case report Rare underlying disorder
Stecker MM <i>et al</i> 1998 USA	16 Adult patients with RSE. All patients intubated. Thiopentone (8) v propofol (8) 1mg/kg over 5 min, repeated if needed.	Open trial	Time to seizure termination (elimination of EEG and clinical seizures) Success at terminating seizures	Thiopentone 123 min vs propofol 2.6 min ($p=0.002$) Thiopentone 82% v propofol 63% (NS)	Open trial. Some of the propofol patients part of another trial. Others identified retrospectively. Very small trial

Comment(s)

The evidence for propofol in RSE is weak. It is based on case series and small open label trials. However, there is some theoretical basis for the use of propofol in RSE and the observations made in the studies presented are encouraging. Further work is clearly needed but in refractory status epilepticus resistant to conventional treatment it would not be unreasonable to try propofol.

►CLINICAL BOTTOM LINE

Propofol may be considered as a treatment for status epilepticus if conventional treatments have failed.

Mackenzie SJ, Kapadia F, Grant IS. Propofol infusion for control of status epilepticus. *Anaesthesia* 1990;**45**:1043–5.

Camprostrini R, Bati MB, Giorgi C, et al. Propofol in the treatment of convulsive status epilepticus: a report of 4 cases. *Rivista di Neurologia* 1991;**61**:176–9.

Borgeat A, Wilder-Smith OH, Jallon P, et al. Propofol in the management of refractory status epilepticus. *Intensive Care Med* 1994;**20**:148–9.

Kuisma M, Roine RO. Propofol in prehospital treatment of convulsive status epilepticus. *Epilepsia* 1995;**36**:1241–3.

Harrison AM, Lugo RA, Schunk JE. Treatment of convulsive status epilepticus with propofol: case report. *Pediatr Emerg Care* 1997;**13**:420–2.

Stecker MM, Kramer TH, Raps EC, et al. Treatment of refractory status epilepticus with propofol: clinical and pharmacokinetic findings. *Epilepsia* 1998;**39**:18–26.

Regional nerve block in fractured neck of femur

Report by Bruce Martin, Specialist Registrar

Checked by Baha Ali, Senior Clinical Fellow

Abstract

A short cut review was carried out to establish whether regional nerve block is better than intravenous analgesia in reducing pain in hip fractures. Altogether 21 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

A 73 year old woman, who is usually fit and well, is brought to the emergency department after a fall. She is complaining of severe pain in her left groin. Examination shows that her left leg is shortened and externally rotated. You make a clinical diagnosis of fractured neck of femur (which is later confirmed radiologically). You wonder whether regional nerve block is better than intravenous analgesia for pain relief.

Three part question

In [patients with suspected neck of femur fracture] is [regional nerve block better than intravenous analgesia] at [providing and maintaining analgesia]?

Search strategy

Medline 1966–12/01 using the OVID interface. (exp femoral neck fractures OR exp hip fractures) AND (exp analgesia OR analgesia.mp) AND (exp nerve block OR nerve block.mp OR exp anesthesia, local OR exp anesthetics, local OR regional anaesthesia.mp OR regional anesthesia.mp).

Search outcome

Altogether 21 papers found. Of these only four were relevant to the preoperative setting (table 5).

Comment(s)

The studies suggest some benefit for the use of nerve block in fractured neck of femur in the pre-operative setting, most notably in extracapsular fractures. However, the studies are small and have important weaknesses.

Table 5

Author, date and country	Patient group	Study type (level of evidence)	Outcomes	Key results	Study weaknesses
Finlayson BJ and Underhill TJ, 1988, UK	36 patients age range 31–95 with fractured neck of femur. Intracapsular (16) and extracapsular (20) Femoral nerve block (10 ml 0.5% bupivacaine)	Cohort study	Objective Assessment Subjective Assessment Complications	29 had reduced sensation. 7 no change (6 intracapsular, 1 extracapsular) 26 patients had reduced pain (14 intracapsular, 12 extracapsular), 4 had no pain (all extracapsular), 6 had no change (all intracapsular) None found	No control group Statistical significance not assessed Heterogenous group of patients (2 young patients, 1 with multiple injuries)
Haddad FS and Williams RL, 1995, UK	50 patients with extracapsular fractures of the femoral neck, age range 68–89 Femoral nerve block (0.3 ml/kg 0.25% bupivacaine) v systemic analgesia alone	RCT	Mean pain score using VAS Analgesic requirements Incidence of complications	Greater reduction in nerve block group—statistically significant at 15 min and 2 hours Reduced in the 24 hours from admission in nerve block group Significantly reduced in nerve block group	Small number of patients. Only extracapsular fractures included. ? Optimal analgesia given to control group
Chudinov A et al, 1999, Israel	40 consecutive patients age 67–96 years with fractured neck of femur undergoing surgery. Continuous psoas compartment block (2 mg/kg/ of 0.25% bupivacaine with 0.8 ml/kg adrenaline) v analgesia	RCT	Pain relief (VAS) Complication Rate	Significant difference in psoas block group at 8 and 16 hours preoperatively and 16, 24, and 32 hours postoperatively 3 cases of local erythema in psoas group	Method of randomisation unclear. Small numbers of patients. Unblinded. Unclear whether optimal analgesia given to control group. Type of block not typically used in emergency setting
Parker MJ et al, 2000, UK	269 patients from 7 randomised or quasi-randomised trials with fractured neck of femur—analgesia/anaesthesia given preoperatively in 2 of these trials. Patients given either regional block or intravenous analgesia	Systematic review	Pain levels Analgesic Requirements Complication rate	Reduction in mean pain score in nerve block group Reduced analgesic requirements in nerve block group No difference	Heterogenous group of patients Trials involving both preoperative and postoperative patients were assessed together Different forms of block used in different trials Small numbers in contributing studies Unclear if amount of parenteral analgesia given was optimal

► CLINICAL BOTTOM LINE

In patients with suspected fractured neck of femur, regional nerve block may be of benefit in reducing parenteral analgesic requirements.

Finlayson BJ, Underhill TJ. Femoral nerve block for analgesia in fractures of the femoral neck. *Archives of Emergency Medicine* 1988;**5**:173–6.

Haddad FS, Williams RL. Femoral nerve block in extracapsular femoral neck fractures. *J Bone Joint Surg Br* 1995;**77**:922–3.

Chudinov A, Berkenstadt H, Salai M, *et al.* Continuous psoas compartment block for anesthesia and perioperative analgesia in patients with hip fractures. *Regional Anesthesia and Pain Medicine* 1999;**24**:563–8.

Parker MJ, Griffiths R, Appadu BN. Nerve blocks (subcostal, lateral cutaneous, femoral, triple, psoas) for hip fractures (Cochrane Review). *Cochrane Database of Systematic Reviews* (computer file) (2):CD001159, 2000.

Bronchodilator delivery in acute severe asthma in adults

Report by **Stuart Teece**, *Research Fellow*

Search checked by Kevin Mackway-Jones, *Professor*

Clinical scenario

A 24 year old known asthmatic is brought into the emergency department by friends. She has been in a smoky bar and has become very wheezy. You assess her asthma as severe. You wonder whether a nebuliser is necessary, or whether a spacer device will suffice.

Three part question

In [an adult with acute severe asthma] is [delivery of bronchodilator therapy via nebuliser or spacer] better at [improving airflow and reducing the need for admission]?

Search strategy

Medline 1966–12/01 using the OVID interface. ([exp asthma OR asthma.mp] AND [exp bronchodilator agents OR bronchodilator\$.mp] AND [exp nebulizers and vaporizers OR nebulise\$.mp OR nebulize\$.mp OR spacer\$.mp]) LIMIT to human AND english language.

Search outcome

Altogether 1734 papers found of which two were meta-analyses that included all other relevant papers (table 6).

Comment

The two meta-analyses have four studies (199 patients) in common.

► CLINICAL BOTTOM LINE

Spacer devices can be used in place of nebulisers in patients with acute severe asthma.

Turner MO, Patel A, Ginsburg S, *et al.* Bronchodilator delivery in acute airflow obstruction. A meta-analysis. *Arch Intern Med* 1997;**157**:1736–44.

Cates C J, Rowe BH. Holding chambers versus nebulisers for beta-agonist treatment of acute asthma (Cochrane Review). In: *The Cochrane Library*, Issue 4, 2001. Oxford: Update Software.

Table 6

Author, date and country	Patient group	Study type (level of evidence)	Outcomes	Key results	Study weaknesses
Turner MO <i>et al</i> , Canada, 1997	12 of 18 randomised trials (507 patients)	Meta-analysis	Effect size	−0.02 (−0.2 to 0.16)	Includes 102 patients with COPD
Cates C and Rowe BH, UK, 2001	7 of 44 randomised trials (375 patients)	Systematic review	FEV1 PEFR Length of stay	No significant difference No significant difference No significant difference	