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British Thoracic Society guidelines on non-invasive ventilation ▶ This is the latest publication from the British Thoracic Society outlining standards for the use of all forms of non-invasive ventilation (NIV) and continuous positive airways pressure (CPAP) for patients in acute respiratory failure. It is a robust and comprehensive document that reviews the available literature to provide evidence based standards of care. It sets minimum standards for the provision of an acute NIV service and provides guidance on how this may be achieved. The authors examine which patients may benefit from NIV or CPAP and give a list of indications and contraindications. They describe the optimum application of different modes of ventilation, define minimal monitoring standards, and address issues of treatment failure. There is discussion on areas that may benefit from further research and facilitation of data collection for audit.

The methodology was uncomplicated: a standard literature search for a review article. All recommendations have been given a grade A-D according to the level of evidence upon which they are based. The article begins with a history of the use of NIV, but leads on quickly to a summary of evidence based recommendations. There is a full review of the different modes of NIV available and an explanation of the different patient-machine interfaces available. The use of NIV and/or CPAP is considered in a wide range of conditions (ranging from COPD and pulmonary oedema to chest trauma and adult respiratory distress syndrome). Indications are clearly laid out, making this document not only an easily accessible practical guide, but also an authoritative text on the subject.

Considering that acute respiratory failure is a common cause for presentation to emergency departments, it is disappointing that this detailed document completely fails to mention the role of the emergency physician in initiating NIV. Indeed, the document has a long list of healthcare professionals who have been demonstrated to be efficient in the implementation of NIV from respiratory and intensive care physicians to lung function technicians and physiotherapists, but emergency physicians or nurses are not mentioned at any point. Presumably, this reflects a relative lack of input from emergency physicians, who need to become familiar with these recommendations and implement local guidelines in conjunction with the respiratory team to allow training of nursing staff to enable early implementation of NIV for appropriate patients.

▲ **British Thoracic Society Standards of Care Committee.** BTS Guideline: non-invasive ventilation in acute respiratory failure. *Thorax* 2002;57:192–211.

Laryngeal mask airways and combitubes in resuscitation ▶ Since 1996, the European Resuscitation Council has advocated the use of combitubes and/or laryngeal mask airways (LMAs) for airway management in cardiac arrest. However, a postal survey to 265 resuscitation departments in the UK indicates that their use has not yet become universal. The results need to be interpreted with a certain amount of caution, given that the survey only achieved a response rate of 58%. However, only 25% of hospitals replied that LMAs were in current use for airway management in cardiac arrest, with a further 27% claiming plans to introduce them to the resuscitation room. Only 5% of departments reported using combitubes in this role. The main area of use of LMAs outside theatres was in those hospitals that do not have on site anaesthetists as part of the resuscitation team. Reasons given for not introducing the use of LMAs included perceived training costs

and difficulties with skill maintenance. The survey notes that those departments using and auditing LMAs regularly in resuscitation have reported no difficulties with their use or training.

▲ **Grayling M, Wilson IH, Thomas B.** The use of the laryngeal mask airway and Combitube in cardiopulmonary resuscitation: a national survey. *Resuscitation* 2002;52:183–6.

Ultrasound, emergency department staff, and pneumoperitoneum ▶ Early confirmation of pneumoperitoneum is important in the management of surgical patients with suspected hollow organ rupture. Plain radiology to detect free air is acknowledged to be unreliable, especially as erect positioning of the acutely unwell patient may not be possible. This study from Taiwan compares the ability of ultrasound and plain radiography to detect pneumoperitoneum in the emergency department. Altogether 188 patients with suspected hollow organ rupture were investigated with plain chest radiographs taken in the erect position, followed by the left lateral decubitus position if the erect film showed no free air. They were then assessed by ultrasound performed by either the emergency department surgeon or physician on duty who had been appropriately trained in its use for the detection of free air. Results were compared with subsequent findings at laparotomy. Ultrasound had improved sensitivity, negative predictive value, and positive predictive value compared with plain radiography. The use of ultrasound was only feasible by having emergency department staff trained in its use, to prevent dependence on out of hours radiology staff.

▲ **Chen SC, Yen ZS, Wang HP, et al.** Ultrasonography is superior to plain radiography in the diagnosis of pneumoperitoneum. *Br J Surg* 2002;89:351–4.

Amiodarone versus lidocaine for shock resistant ventricular fibrillation ▶ Internationally agreed guidelines have resulted in amiodarone being used with increasing frequency in the management of life threatening cardiac arrhythmias. This Canadian paper provides evidence to support its use in ventricular fibrillation (VF) in a prehospital setting. A prospective double blinded randomised controlled trial compared the use of lidocaine (lignocaine) with amiodarone in the treatment of shock resistant VF. A total of 347 patients with an out of hospital VF arrest, unresponsive to three defibrillation shocks, epinephrine (adrenaline) and a further shock, or recurrent VF after successful defibrillation, were enrolled. They were randomised to either amiodarone plus lignocaine placebo, or lignocaine plus amiodarone placebo. Results were given as survival to admission to intensive care from the emergency department. There was a survival advantage of 22.8% in the amiodarone group compared with those receiving lidocaine. However, no results were given for survival to discharge.

▲ **Dorian P, Cass D, Schwartz B, et al.** Amiodarone as compared with lidocaine for shock-resistant ventricular fibrillation. *N Engl J Med* 2002;346:884–90.

Early intravenous salbutamol for severe acute asthma in children ▶ Emergency treatment of acute asthma in children usually follows well established guidelines. The results of this double blind randomised controlled trial favours an earlier use of intravenous salbutamol. The trial included 55 children with acute severe asthma, and compared the use of nebulised ipratropium with an early administration of a bolus of intravenous salbutamol. Initial management for all children included nebulised salbutamol, but then if symptoms persisted at 20 minutes, treatment was randomised to three groups: 15 µg/kg intravenous salbutamol over 10 minutes, 250 µg nebulised ipratropium, or both. All groups also received 1 mg/kg intravenous methylprednisolone. The salbutamol group had a significantly faster time to reduction in symptoms than the ipratropium group, and a discharge time of 28 hours earlier. Combination therapy conferred no extra benefit. The authors postulate that the relative delay to symptom resolution in those children treated conventionally with nebulised ipratropium

as being attributable to the impaired drug delivery to the site of action in children with airways narrowed from acute inflammation.

▲ **Browne GJ**, Trieu L, van Asperen P. Randomized, double-blind, placebo-controlled trial of intravenous salbutamol and nebulized ipratropium bromide in early management of severe acute asthma in children presenting to an emergency department. *Crit Care Med* 2002;**30**:448–53.

Motorcycle helmets do save lives! ► The compulsory use of motorcycle helmets has been law for so long in many countries that it has been taken for granted. However, this is not true internationally: in Florida, a previously mandatory motorcycle helmet law has recently been repealed. This has provided physicians with an ideal opportunity to reassess the contribution of helmets to motorcycle safety. Deaths and morbidity of all motorcycle related trauma patients at two trauma centres were compared retrospectively for two six-month periods, before and after the law was repealed. Helmet use fell from 83% to 56% with a concomitant rise in the numbers of serious brain injuries. There was a doubling in the number of fatalities, although overall numbers remained low. So, in case there was any doubt, the use of motorcycle helmets does save lives and decreases morbidity.

▲ **Hotz GA**, Cohn SM, Popkin C, *et al.* The impact of a repealed motorcycle helmet law in Miami-Dade county. *J Trauma* 2001;**52**:469–74.

Lack of benefit of nebulised adrenaline in bronchiolitis ► Bronchiolitis is a common cause of paediatric presentation to emergency departments, especially in the winter months. Treatment is usually supportive, with the role of specific therapeutic agents being frequently debated, particularly the use of nebulised adrenaline. In this study, children less than 1 year in age presenting with a clinical diagnosis of bronchiolitis were first stabilised with oxygen to maintain saturations over 90%, given antipyretics for temperatures more than 38°C and/or received suction of nasal secretions. After 30 minutes, they were then randomised to receive either 3 mg nebulised adrenaline or a saline placebo. The only other interventions were supportive nursing measures, such as feeding or changing wet nappies, but the children were handled as little as possible to allow them to settle or sleep. There was no difference in outcome in either group as measured by clinical observations or respiratory distress score. The study did not quite manage to recruit the required numbers to achieve significance (38 instead of 40 in total), but still provides evidence against there being any benefit from the use of adrenaline in the first line management of bronchiolitis.

▲ **Abul-Ainine A**, Luyt D. Short term effects of adrenaline in bronchiolitis: a randomised controlled trial. *Arch Dis Child* 2002;**86**:276–9.

Head injuries in infant bouncy chairs and car seats ► Head injuries in children account for a large proportion of emergency department work. Many parents of young children acknowledge that infant bouncy chairs and car seats can have useful roles as portable devices away from the usual child environment. However, a team in an UK paediatric emergency department warns of the risk of head injury to children when bouncy chairs or car seats are used as an indoor chair. They found that 13% of all infant head injuries that presented to their department over a 12 month period had occurred when the child had fallen from a height while sitting in a bouncy chair or car seat placed on a high surface. These injuries occurred despite manufacturers' warnings that these seats should not be placed on a raised surface. The authors of this study recommend, for example, that an infant in a bouncy chair or car seat is safer if the device is placed on the floor, rather than on the kitchen worktop. Certainly, as far as a fall to the ground is concerned, this would be true, but their advice does not take into account additional risks that might result (such as the risk of being scalded from hot drinks/liquids that had been knocked over on tables or worktops above the child).

▲ **Wickham T**, Abrahamson E. Head injuries in infants: the risks of bouncy chairs and car seats. *Arch Dis Child* 2002;**86**:168–9.

The Cochrane Library is a relevant resource for emergency medicine ► Physicians aspiring to practise evidence based medicine are assisted by the ease of access to online databases. The Cochrane Database of Systemic Reviews (CDSR) permits direct access to a compilation of regularly updated systemic reviews with meta-analytic summary statistics. The number of completed reviews is rapidly proliferating. But how many of these have relevance to emergency medicine? A search of 795 reviews completed since April 2000 found that over 30% have some relevance

and 12% (95 reviews) have direct relevance to emergency medicine. Some fields are well represented (such as managing airway problems and acute respiratory infections), and some are under-represented (such as emergency cardiology and wound care), but overall the authors conclude that the CDSR is a valuable resource for the emergency physician.

▲ **Emond SD**, Wyer PC, Brown MD, *et al.* How relevant are the systematic reviews in the Cochrane Library to emergency medical practice? *Ann Emerg Med* 2002;**39**:153–8.

Ondansetron for vomiting children with gastroenteritis ► Two studies have recently been published reporting the use of ondansetron to prevent vomiting in children caused by acute gastroenteritis. Both studies were prospective, randomised, double blinded and funded by the same pharmaceutical company, but were otherwise different in design and intervention. The first enrolled 107 "children" from age 1 month to 22 years (!) on the basis of a clinical diagnosis of gastroenteritis, with three or more episodes of vomiting in 24 hours and a clinical need for "standard" intravenous fluid therapy. The ondansetron was given intravenously with a saline placebo to the control arm. The second study enrolled 145 children from age 6 months to 12 years based upon a clinical diagnosis of gastroenteritis, with five or more episodes of vomiting in the previous 24 hours. First line rehydration was with "standard" oral rehydration fluids. The ondansetron was given orally and was compared with a taste and colour matched placebo—if successful antiemesis was achieved, a further five doses were given for eight hourly administration at home if required. Both studies reported a decrease in vomiting rate, a decreased admission rate and the second study claimed fewer requirements for intravenous fluids with the ondansetron. Acute gastroenteritis is common in children and repetitive vomiting is distressing for child and parents alike. The authors of both papers recommend the regular use of this 5-HT₃ antagonist to minimise vomiting, permitting early reintroduction of an oral diet and decrease the requirement for inpatient treatment.

▲ **Reeves JJ**, Shannon MW, Fleisher GR. Ondansetron decreases vomiting associated with acute gastroenteritis: a randomized, controlled trial. *Pediatrics* 2002;**109**:e62.

▲ **Ramsok C**, Sahagun-Carreón I, Kozinetz CA, *et al.* A randomized clinical trial comparing oral ondansetron with placebo in children with vomiting from acute gastroenteritis. *Ann Emerg Med* 2002;**39**:397–403.

Thrombolysis for acute myocardial infarction in the elderly population ► Fibrinolytic treatment is so well established as the treatment for acute myocardial infarction (AMI) in most hospitals in the UK, that it forms part of the NHS Plan and National Service Framework for Coronary Heart Disease. Having acknowledged it as the treatment of choice, are all patients obtaining benefit from early thrombolysis for AMI, or are some being exposed to unacceptable side effects for no significant gain? Two editorials in *Heart* focus upon thrombolysis in elderly patients, prompted by claims that fibrinolytic treatment did not confer a survival benefit in those over 75 years of age. The authors reviewed the evidence from subgroup analysis of large trials. They discussed the increased incidence of bleeding and fatal stroke from fibrinolytic treatment of AMI in this age group, and suggest over-heparinisation by use of standard non-weight adjusted heparin regimens with t-PA may be a contributory factor. However, given the high absolute mortality of elderly patients with AMI, the first editorial concludes that even a smaller relative risk reduction with thrombolysis confers a substantial overall benefit. The second editorial urges caution, but agrees that the elderly patient with early presentation and clear cut new ST elevation (especially in the anterior leads) or new bundle branch block will benefit from thrombolysis. They question the use of thrombolysis outside these parameters and conclude that "high rates of thrombolysis administered rapidly without regard to characteristics of the population under treatment should not be regarded as a measure of high quality care".

▲ **Estess JM**, Topol EJ. Fibrinolytic treatment for elderly patients with acute myocardial infarction. *Heart* 2002;**87**:308–11.

▲ **Ball SG**. Thrombolysis: too old and too young. *Heart* 2002;**87**:212–13.

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