

Society of Triservice Anaesthetic Trainees Annual Scientific Meeting 2010

This meeting was held at RAF Wyton, Cambridgeshire, on the 22-23 Jul 2010. Sq Ldr Elise Haites RAF won the Dave Hughes Memorial Prize for the best Trainees presentation. There were nine presentations in all and their abstracts are published here; three (*) have been written as full articles in this supplement of the Journal of Royal Army Medical Corps.

Are CCAST patients developing a metabolic acidosis in-flight and if so is lactate monitoring necessary?

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Introduction: Critical care aeromedical transfer flights run by the Royal Air Force Critical Care Air Support Team (CCAST) serve to transfer severely ill trauma victims. At present on CCAST flights the base excess is used to assess acid-base balance. Lactate monitoring is not currently carried out although it is possible. Cardiac output monitoring is not available. The primary aim of this audit was to assess whether our patients are developing metabolic acidosis in flight as demonstrated by a change in base excess and to assess whether there was a case for the introduction of routine lactate monitoring on CCAST flights. Secondary aims were to assess fluid balance in flight for CCAST patients and percentage of fluid delivered which is crystalloid. **Methods:** A retrospective audit was performed by analysis of aeromedical notes for all CCAST patients during the period of 12 July – 22 December 2009 (n=70). **Results:** There was a mean change in base excess of -0.99 (95% CI -1.55 to -0.42) P<0.01. 26 patients had a lactate measurement during flight. The median lactate measurement was 1.38mmol/L. Mean fluid balance throughout the flight was found to be +1472mL (95% CI 1218mL - 1726mL). The mean volume of fluid that patients received during flight was 2689mL. The crystalloid component of the total fluid delivery was on average 59% (95% CI 54.7 to 63.3). Those patients who received a smaller total volume of fluid during the flight tended to receive a higher proportion of crystalloid than those who received larger volumes. Pearson's correlation coefficient r=-0.35 (95% CI -0.13 to -0.54) p<0.05. **Conclusions:** Clinicians should be wary of occult hypoperfusion in our patient group. This audit supported the case for introduction of routine lactate monitoring for all CCAST patients. Following introduction, a re-audit shall be performed to determine whether there has been a change in the pattern of fluid usage.

Air ambulance versus standard ambulance transfer – timing of definitive care and outcome for severe head injuries.

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Introduction: Recent investigations have identified failings in the UK trauma system including Prehospital care [1]. This study assesses the impact of method of transfer (group one; doctor-paramedic air ambulance, group two; land ambulance and group

three; land ambulance via DGH) on timing of arrival in A&E, CT scan, secondary prevention (induction of anaesthesia and ventilation), definitive care (neurosurgery), survival to ICU/hospital discharge and Glasgow Outcome Score (GOS) at 6 months. **Method:** All patients with severe head injury requiring intubation, admitted to a regional neurosurgical ICU in 2009 were included. Timings were identified and triangulated from Ambulance Service Call Logs, Radiology and Theatre IT systems. GOS was identified by Neuropsychology/Neurosurgery assessment at 6 months. **Results:** 46 patients were identified. Arrival time was similar in each group, 77/53.1/61.8mins. Mean time from hospital arrival to CT was 42/106.7/177mins, injury to secondary prevention 48.7/106.6/170.6mins, injury to surgery 155/229/372mins. Patients receiving surgery within 4 hours was 100%/66.7%/14.3%. Survival to ICU discharge was 80%/60%/75%, hospital discharge 80%/53%/68% and GOS at 6 months 1/3/2. Mean delay in transfer via DGH was 4.5 hours. **Conclusion:** Patients transferred via a DGH experienced the longest delays in all categories. Patients transferred by air ambulance received secondary prevention >1 hour earlier than those transferred directly via land crew, having a reduced time to CT, surgery and a greater survival to ICU discharge, hospital discharge and improved GOS at 6 months. This study is limited by small numbers but has resulted in improved air ambulance tasking in this region.

References:

1. NCEPOD, Trauma: Who Cares? 2007.

National Survey of UK Anaesthetic Trainee Attitudes to Work Place Assessment Paperwork

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Introduction: In 2007, the Royal College of Anaesthetists (RCOA) introduced work place assessments that are now compulsory for anaesthetic trainees [1]. These consist of Direct Observation of Procedural Skill (DOPS), Mini-Clinical Evaluation Exercise (Mini-CEX), Case Based Discussion (CBD) and Multisource Feedback (MSF). Previously one of these assessment tools, the Mini-CEX was found to be useful by trainees in New Zealand [2]. This study looks at the attitude of UK Anaesthetic trainees towards these new assessment tools. **Method:** An online survey was distributed to trainees by email using School of Anaesthesia administrators as points of contact. The survey questions rated trainees' level of agreement with pre-determined statements about the assessment tool's usefulness, fairness and feasibility. **Results:** The response rate was 349/1400 (25%) with respondents from 88 different hospitals. The DOPS was the least well received with only 101/348 of responders regarding it as useful training tool. The CBD was the best received with 139/346 considering

it useful. The majority of trainees (188/345) disputed the fairness of the Mini-CEX, found annual numbers difficult to achieve (173/340) and tended to conduct them in a way to optimise results (173/340). The free text comment suggested the utility of all the tools could be increased by improving assessor training.

Conclusion: UK anaesthetic trainee attitudes do not mirror the New Zealand trainees' positive acceptance of this style of assessment tool and effort should be directed towards improving assessor training to help improve the perceived educational benefit.

References:

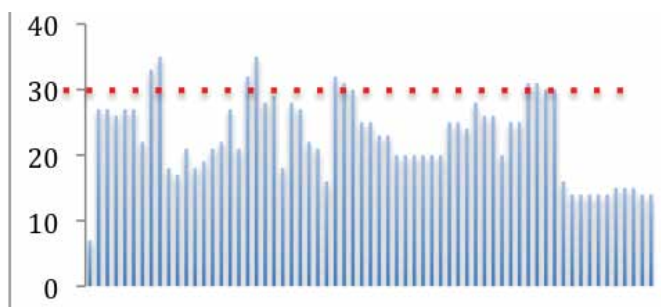
1. The Royal College of Anaesthetists. The CCT in Anaesthetics I: General Principles. A manual for trainees and trainers. Edition January 2007. Available at: <http://www.rcoa.ac.uk/docs/CCTPartIJuly2010.pdf> (accessed 11/10/10)
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Thin or Fat, Age or Beauty-The Red Cell in Critical Care

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Introduction: The transfusion of blood products has been occurring since the 17th century. The indication for treatment can be varied but the overriding indications are to increase the circulating plasma volume and the concentration of the oxygen-carrying molecule Haemoglobin. It is a therapy that is not without side effects and annual Serious Hazards of Transfusion (SHOT) reports show an increasing number of incident reports though thankfully a reducing number of deaths as a result of transfusion. A paper from 2009 [1] suggested a link between the age of the red blood cell transfused and mortality amongst trauma patients. A paper this year looked at transfusion in Paediatric patients and found a suggested increased risk when the blood transfused was over 15 days old. **Methods:** During a 6 month period I reviewed all transfusions given on 3 separate ITUs across Leicester and recorded the transfusion trigger level of Haemoglobin and the age of the packed red cell product given. 32 patients were given a total of 64 units of blood. All patients were from a general ITU and none were being actively resuscitated when the blood was administered. **Results:** 18 (56%) of patients were transfused when their haemoglobins were over 7 g/dl (our current transfusion trigger identified from the TRICC group). The graph below shows a plot of the age of each blood unit given. The red dotted line is 28 days, which was the age above that Spinella [1] group associated with increases risk. Karam group [2] identified a risk in blood aged 15 days and over.



Conclusions: Red blood cells are administered on a regular basis in our military and civilian Critical Care patients. It is clearly a

therapy that provides enormous benefit but the question of when to transfuse and with what aged cell contains to be debated and on going research continues. I do not think there is much doubt that the younger the red blood cell is the better it serves its purpose and we need to identify the patients in who that will make a difference.

References:

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2. Karam O, Tucci M, Bateman ST, et al. Association between length of storage of red blood cell units and outcome of critically ill children: a prospective observational study. *Critical Care* 2010; **14**: R57

*** Current Epidural Practice – Results of a Survey of Military Anaesthetists**

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Introduction: Epidurals are now used for pain relief on deployment [1] and although a National Audit on complications of central neuraxial blocks [2] has been recently carried out there are few published studies looking at personal epidural practice. A survey was conducted to look at the current epidural practice of UK military anaesthetists. Due to the fact equipment available on deployment may vary from that in the UK, the aim of the survey was to identify any potential issues with regard to equipment and training to allow future development of pre-deployment training.

Methods: An internet based survey was carried out. All military anaesthetists were sent an e-mail containing a link to the survey and the results of those who responded were analysed. **Results:** A total of 49 surveys were completed. Within their UK practice 78% of respondents carried out epidurals more than once a month, in a wide range of specialities. There was considerable variation in methods of securing epidurals and in drug choice amongst respondents. **Conclusions:** The results of this survey show that whilst epidurals are commonly carried out amongst military anaesthetists during their UK practice, there is significant variation within the practice. Areas have been identified for development of educational courses, for example methods of securing epidurals, and these have already been acted upon.

References:

1. Connor DJ, Ralph JK, Aldington DJ. Field Hospital Analgesia. *J R Army Med Corps* 2009; **155**: 49-56
2. Cook TM, Counsell D, Wildsmith JAW. Major Complications of Central Neuraxial Block: report on the Third Audit Project of the Royal College of Anaesthetists. *Br J Anaesth* 2009; **102**: 179-90

A Survey Of Ketamine Use Within The Defence Medical Services

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Introduction: Ketamine is a versatile drug that can be used for analgesia, sedation and anaesthesia. It is provided in military pre-hospital modules for use by General Duties Medical Officers. However, its use is not without side effects, some of which may be significant [1]. Unfortunately, while ketamine can be of great

use to the military healthcare provider [2], experience of its use in UK civilian practice is often very limited [3]. The aim of this study was to establish how widely, within the UK Defence Medical Services (DMS), ketamine is used, how often side effects occur, and how people are trained in its use. **Method:** An internet based questionnaire was designed (www.surveymonkey.com). It comprised 10 multiple-choice questions. Invitations to complete the questions were promulgated via the Defence Professors of Anaesthesia, General Practice and Emergency Medicine. **Results:** 159 respondents completed the survey. Just under half (46%), 73 respondents were trainees. Anaesthesia was the predominant speciality (63%), 19% from Emergency Medicine and 18% General Practice. 15% of respondents had never used ketamine citing lack of familiarity as the predominate reason. Of the 85% who had used it few reported having difficulties with side effects. Only 38% of those involved in military pre-hospital care reported receiving formal training. **Discussion:** A high proportion of the respondents were anaesthetists so an inherently biased sample; but they of all groups should have access to training and experience in its use in the UK, together with experience of handling many of the side effects. This is the first survey of its kind to have been undertaken across such a broad-spectrum of physicians. This survey, despite its weaknesses, has been used to provide formal evidence of a training opportunity that has recently been recognised by the DMS.

References:

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3. Green SM, Krauss B Ketamine is a safe, effective, and appropriate technique for emergency department paediatric procedural sedation. *Emerg Med J* 2004; **21**: 271-272.

*Vascular Access on the 21st Century Military Battlefield

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Introduction: Timely and appropriate access to the vascular circulation is critical in the management of 21st century battlefield trauma, allowing the administration of emergency drugs, analgesics and rapid replacement of blood volume. Methods used to gain access can include the cannulation of peripheral and central veins, venous cut-down and intraosseus devices. **Method:** We reviewed the current literature in both English speaking and non-English speaking countries on the benefits and complications of each vascular access method. **Conclusion:** Intraosseus devices are best for quick access to the circulation, with central venous access via the subclavian route for large volume resuscitation and low complication rates. Military clinicians involved with the care of trauma patients either in Role 2 and 3 or as part of the Medical Emergency Response Team (MERT), must have the skill set to use these vascular access techniques by incorporating them into their core medical training.

*TIVA for War Surgery

SE Lewis

Total Intravenous Anaesthesia (TIVA) may be defined as the delivery of agents into the bloodstream to achieve a balance of hypnosis, analgesia and muscle relaxation. Military Anaesthetists have been using TIVA for war surgery since World War II and every conflict has produced advances in its practice. TIVA finds application at every echelon of care including the pre-hospital phase and during strategic transfer to the UK. Advantages that it possesses over Volatile Gas Anaesthesia (VGA) include a much smaller logistic footprint, favourable recovery characteristics, no potential for triggering malignant hyperthermia and potentially beneficial modulation of the stress response. Disadvantages include a perceived increase in risk of awareness and reduced familiarity with its use amongst the anaesthetic cadre. A literature search and survey of subject matter experts within the DMS anaesthetic cadre produced a selection of protocols for achieving TIVA appropriate to different patients and situations including one based on drip rate through a giving set with no infusion pump required. Future areas of development for TIVA within the DMS might include the introduction of Target Controlled Infusion (TCI) pumps and/or depth of anaesthesia monitoring. TIVA should be considered as a valid alternative to VGA for war surgery.