

## **Research**

**Thompson M, Millins C, Nicholl J, Turner J, Woollard M, Greaves I.** An observational study of the effect of different methods of targeting helicopter ambulances

### GRANT DETAILS

Department of Health, approx. £271,156

### BACKGROUND

This controlled trial will compare the existing ambulance service dispatch centre-led model of activating helicopter air ambulance services with direct requests from 'first one scene' responders. This latter group will include Ambulance Crews, Police, Fire Service, Coastguard, RNLI, Mountain Rescue and BASICS doctors. The aim of the study is to compare how well ambulance helicopters can be targeted at those patients most likely to benefit from their use. Both sensitivity and specificity will be examined.

### PROGRESS

*Data collection and analysis have now been completed and report is currently being written. Usage rate of Direct Access algorithm has been very low, although tasking via this method seems to be associated with dispatch to patients with injury severity scores. By contrast, tasking via self activation based on ambulance control data seems to be associated with responses to patients with injury severity scores in single figures.*

*We were asked by the DH to extend the current study by four months, to undertake a questionnaire-based survey to explore perceptions of ambulance and emergency services staff regarding why Direct Access had so such a low utilisation rate.*

**Jenkins E, Woollard M, Newcombe R, Robertson-Steel I, Scrase I.** Accuracy of paramedic and emergency department diagnosis of acute cardiogenic pulmonary oedema: A prospective diagnostic study

### GRANT DETAILS

Carried out within own resources

### SUMMARY

Data available from the USA indicates that paramedics have limited accuracy in diagnosing acute cardiogenic pulmonary oedema (ACPO), and that this is also true for Emergency department (ED) staff. Failure to identify and treat ACPO renders pre-hospital care ineffective, whilst inappropriate administration of nitrates, furosemide, and CPAP to non-ACPO patients with severe respiratory distress results in increased mortality. This audit aims to determine the current accuracy with which paramedics and ED staff diagnose ACPO against a reference standard of hospital discharge diagnosis.

### PROGRESS

*West Midlands Ambulance Service and Hartlands hospital agreed to allow access to data. Data collection and analysis completed, paper in preparation. Results suggest that paramedics identify acute cardiogenic pulmonary oedema with a specificity of 95% but with a sensitivity of only 47%.*

**Woollard M, Lighton D, Watt J, McCrea C, Hamilton N, O'Meara P, Smyth, M.** Airtraq versus standard laryngoscopy in a model of difficult intubation: the ACAP (NSW) / CSU randomised cross-over trial

GRANT DETAILS

Charles Sturt University / Australian College of Ambulance Professionals: £2,500

BACKGROUND

This randomised cross-over trial aimed to determine if use of the Airtraq by third year student paramedics resulted in improved intubation success rates compared to standard laryngoscopy in a manikin model of a grade III / IV Cormack and Lehane view.

PROGRESS

*Data collection and analysis complete. Paper in preparation. First time intubation success rates for the Macintosh and Airtraq respectively were 0/23 (0%) versus 10/23 (44%) (44% difference, 95% CI 26 to 63%,  $P<0.001$ ); cumulative intubation success rates (after 3 attempts) 7/23 (30%) versus 18/23 (78%) (48% difference, 95% CI 19 to 69%,  $p<0.002$ ); first-time oesophageal intubation rates 15/23 (65%) versus 3/23 (13%) (-52% difference, 95% CI -25 to -72%,  $P<0.001$ ); student-rated difficulty of use scores 88 (IQ range 78 to 97, range 37 to 100) versus 21 (IQ range 15 to 50, range 0 to 100),  $p<0.001$ .*

**Woollard M, Lighton D, Mannion W, Johns I, O'Meara P, Cotton C, Smyth, M.** Airtraq versus standard laryngoscopy in a model of difficult intubation: the ACAP (NSW) / CSU randomised cross-over trial

GRANT DETAILS

Charles Sturt University / Australian College of Ambulance Professionals: £500

BACKGROUND

This trial aimed to determine if use of the Airtraq by pre-hospital practitioners previously trained in standard laryngoscopy results in greater first-time success rates compared to use of a standard laryngoscope in a manikin model of a Cormack and Lehane grade III / IV view.

PROGRESS

*Data collection and analysis complete. Paper in preparation. After five minutes training with the Airtraq, first-time intubation success rates were 14/56 (25%) with a Macintosh laryngoscope (no. 4 blade) and malleable stylet, compared with 47/56 (84%) with the Airtraq (difference 59%, 95% CI 42 to 72%,  $p<0.0001$ ).*

**Woollard M, Lighton D, Mannion W, Johns I, O'Meara P, Cotton C, Smyth, M.** Use of Airtraq by pre-hospital personnel not previously trained in laryngoscopy in a model of difficult intubation: the ACAP (NSW) / CSU prospective cohort study

GRANT DETAILS

Charles Sturt University / Australian College of Ambulance Professionals: £500

BACKGROUND

This study evaluated the ability of basic life support level pre-hospital, not previously trained in laryngoscopy, to use the Airtraq device to undertake endotracheal intubation in a manikin model of a Cormack and Lehane grade III/IV view.

## PROGRESS

*Data collection and analysis complete. Paper in preparation. After an average of less than five minutes training, the first time intubation success rate per subject (defined as a correctly placed ET tube in situ with a breath-to-breath interval of 30 seconds or less) was 26/38 (79%, 95% CI 61 to 91%).*

**Sewell M, Woollard M, Newcombe R, Clark T, Scrase I.** The incidence of opiate-induced nausea and vomiting in the pre-hospital setting: a prospective observational study

## GRANT DETAILS

James Cook University Hospital, £3,500

## BACKGROUND

This study aims to determine the incidence and severity of opiate-induced nausea and vomiting in the pre-hospital setting. A convenience sample of 400 patients requiring opiate analgesia for pain will be treated by paramedics using existing treatment guidelines. The incidence and severity of emesis will be recorded using a pre-hospital nausea and vomiting scoring system both before and after drug therapy. In addition, data will be collected relating to use of opiate and anti-emetic, patient's sex, propensity to motion sickness, smoking status, and position during transport.

## PROGRESS

*Protocol completed, ethics and research governance approval obtained. North East Ambulance Service have agreed to collect data: study due to commence in February 2007.*

**Woollard M, West R, Newcombe R, Mackway-Jones K, Mellor T.** Telephone cardio-pulmonary resuscitation instructions for out-of-hospital cardiac arrest: prospective observational study comparing compression-only and standard algorithms

## GRANT DETAILS

Application to be made

## BACKGROUND

Early cardio-pulmonary resuscitation (CPR) is a key factor in improving survival from cardiac arrest. Public uptake of CPR courses is variable, however, with poor skill acquisition and retention. Consequently, effective pre-hospital CPR may be rare, but cardiac arrest can be identified by ambulance dispatchers and telephone treatment instructions provided. Most incidents occur near a telephone in the presence of relatives able to respond to directions.

Lay responders are often reluctant to provide mouth-to-mouth ventilation, and as few as half of patients actually receive CPR after telephone instruction. But CPR can also be given without ventilation. Animal research shows coronary artery and cerebral blood flow are improved if chest compressions are uninterrupted by pauses for ventilation. Ten minutes of such treatment does not adversely affect outcome, even with an obstructed airway.

Telephone compression-only instructions may improve survival from out-of-hospital cardiac arrest because it may be both more acceptable and efficacious. An American Heart Association statement has supported research into compression-only CPR. Three studies have examined the efficacy of telephone CPR instruction in a manikin model of cardiac arrest. None were RCTs and none evaluated compliance with a standardised telephone CPR instruction protocol. One human study comparing standard and compression-only instructions found no statistically significant difference in survival, arguably because of unsatisfactory

telephone instructions. The proposed trial will use a scripted compliance-monitored protocol to offset this risk.

#### AIMS AND OBJECTIVES

To compare survival to discharge from of out-of-hospital cardiac arrest after standard or compression-only telephone CPR instructions.

#### METHODOLOGY

Naturalistic observational study using a 'before and after' design. This will monitor survival from out-of-hospital cardiac arrest for a one year period with use of standard telephone CPR instructions, and then for a further year after the planned introduction of compression-only algorithms. To identify a difference in survival of 4.2% with a 'baseline' UK survival of 4.5% requires 730 patients per group (power 90% and alpha 0.05). However, a 60% exclusion rate and 50% bystander uptake indicates a requirement for a total of 7,300 patients. In the year period of the study it is anticipated that 8,800 patients will be recruited, thus exceeding the calculated sample size requirement.

#### PROGRESS

*Recruitment started in December 2005. Over 4,000 patients recruited to date in the standard CPR phase.*

**Hunt P, Greaves I.** Predictive factors for the development of psychological and neurocognitive dysfunction following mild traumatic brain injury (mTBI) in adults: a prospective cohort study.

#### GRANT DETAILS

Ministry of Defence, £125,000

#### BACKGROUND

This study aims to identify predictive factors for the development of psychological and neurocognitive dysfunction following mild traumatic brain injury (mTBI) in adults.

#### PROGRESS

*Protocol completed. Study to commence quarter one / two 2007.*

**Rabbetts C, Woollard M** (In conjunction with the British Paramedic Association). Paramedic's perceptions and willingness to facilitate tissue donation

#### GRANT DETAILS

James Cook University Hospital, £1,750

#### BACKGROUND

This study will evaluate paramedics current knowledge of tissue donation and their views about facilitating donations from patients they have pronounced in the field.

#### PROGRESS

*Protocol in late development. Study to commence quarter one / two 2007.*

**Woollard M, Davidson G, Meehan C, Grieff A, Han K.** Outcome from out-of-hospital cardiac arrest: a pilot randomised controlled trial comparing survival after standard or inspiratory impedance threshold valve augmented CPR

#### GRANT DETAILS

Zoll Medical UK Limited: £10,000 for equipment costs

#### RESEARCH QUESTION

Does impedance threshold valve augmented cardiopulmonary resuscitation (CPR) instruction increase survival to discharge following out-of-hospital cardiac arrest in comparison with standard CPR?

#### RESEARCH AIMS

To compare survival to discharge from of out-of-hospital cardiac arrest after the use of inspiratory impedance threshold valve augmented CPR (ITVCPR) or standard CPR (SCPR) (randomised trial using intention to treat analysis).

#### PROGRESS

*Protocol finalised and all ethics and research approvals obtained. However start postponed until new resuscitation guidelines have been introduced into ambulance trusts to avoid data confounding. Consideration being given to moving this to an alternative ambulance trust.*

**Woollard M**, Kumar S, Baker E, Satheesan S, Whetter D, Melling A, Leaper D. A pilot randomised controlled trial of systemic warming during ambulance transport of elderly fallers and patients with abdominal pain or suspected fractured neck of femur

#### GRANT DETAILS

Application to be made, estimated £120,000

#### SUMMARY

This pilot RCT will investigate the benefits of novel warming technologies in improving the outcome of patients in the pre-hospital setting. Patients who are elderly fallers, or are immobilised due to a fractured neck of femur, or suffering abdominal pain, will be recruited. Outcome measures will include disposition at discharge, length of hospital stay, infection rates, and pressure sore incidence and severity.

#### PROGRESS

*Protocol fully developed. Local ambulance service unwilling to participate so currently seeking new partner ambulance trust.*

**Woollard M**, Quinn T, Newcombe R, **Scrase I**. Continuous positive airway pressure versus standard treatment administered by paramedics for acute cardiogenic pulmonary oedema: a randomised controlled trial

#### GRANT DETAILS

Cost £308,548. Application to be made, via DH Research for Patient Benefit or BHF

#### BACKGROUND

This randomised controlled trial will assess the relative efficacy of continuous positive airway pressure delivered by mask using the Boussignac system with standard treatment in the management of acute cardiogenic pulmonary oedema in an ambulance service setting.

#### PROGRESS

*Protocol almost complete: requires completion of diagnostic study to allow sample size calculation to be made.*

**Woollard M**, Graham S, Hicks G, Brown G, **Scrase I**. A factorial randomised controlled trial comparing the efficacy of metoclopramide with ondansetron given prophylactically or as needed in the pre-hospital setting

GRANT DETAILS

Cost £243,861. Application to be made via DH Research for Patient Benefit

BACKGROUND

This randomised controlled trial will compare the relative efficacy of ondansetron and metoclopramide in the pre-hospital setting. Both drugs will be evaluated when given prophylactically with opiates, and when administered only after the development of nausea or vomiting.

PROGRESS

*Protocol almost complete: requires completion of incidence study to allow sample size calculation to be made. North East Ambulance Service have agreed to collect data, several others, including West Country, have expressed an interest.*

**Woollard M**, Boyle M, Walker T, Patrick I. A randomised controlled trial comparing skill acquisition and retention in paramedics taught needle and surgical cricothyroidotomy.

GRANT DETAILS

In process: Victoria Trauma Foundation (Australia) £80,524 (\$201,656)

BACKGROUND

This RCT will compare initial skill acquisition and subsequent retention at three, six, and twelve month intervals in Australian Mobile Intensive Care Paramedics randomised to training in either needle or surgical cricothyroidotomy.

PROGRESS

*Outline protocol completed, expression of interest for funding submitted.*

**Woollard M**, Boyle M, Walker T, Patrick I. Improving first-time intubation success rates in trauma patients: a randomised controlled trial comparing Airtraq and a standard laryngoscopy device

GRANT DETAILS

In process: Victoria Trauma Foundation (Australia) £82,372 (\$206,167)

BACKGROUND

This RCT will compare first-time intubation success rates in trauma patients managed by Australian Mobile Intensive Care Paramedics from the Victorian Ambulance Air Wing using either the Airtraq or a standard laryngoscope.

PROGRESS

*Outline protocol completed, expression of interest for funding submitted.*

**Woollard M**, Jewkes F, MacConochie I, Holt C. Paramedic-administered steroids in the management of croup: a multi-centre randomised controlled trial (*in conjunction with the British Paramedic Association*)

GRANT DETAILS

Application to be made

BACKGROUND

This RCT will evaluate the potential benefits of early administration of steroids to children suffering from moderate to severe croup by paramedics in the pre-hospital setting. Outcome measures will compare the proportion of children admitted as in-patients and progressive changes in condition over time in the ambulance and following admission the emergency department.

PROGRESS

*Protocol in development*

**Woollard M, Nellis I, Connolly J.** Can paramedics use portable ultrasound to identify free abdominal fluid and abdominal aortic aneurysm following a short course? The Paramedic ULtraSound Examination (PULSE) study

GRANT DETAILS

Application to be made

BACKGROUND

This study will evaluate the ability of paramedics to detect free abdominal fluid and abdominal aortic aneurysms using portable ultrasound scanners following a two-day course.

PROGRESS

*Protocol in development*

**Woollard M, Laird C, James D, Greaves I.** A randomised controlled trial evaluating the benefit of repetitious telemetry-based distance learning on retention of pre-hospital care skills

GRANT DETAILS

Application to be made: estimated at £200,000

SUMMARY

This RCT will evaluate skill retention in pre-hospital care providers working in remote areas following an initial traditional face-to-face course. The intervention group will be invited to participate in six further training sessions at monthly intervals that will be delivered via audio-visual links. Skill retention will be assessed using competency-based checklists to assess the performance of subjects in managing standardised manikin scenarios.

PROGRESS

*Protocol fully developed. Funding being sought by C Laird.*

**Woollard M, Smyth M, Black J, Wyse M, Ward M.** Airtraq versus standard laryngoscopy in a pre-hospital setting: a randomised controlled trial

GRANT DETAILS

Application to be made

BACKGROUND

This RCT will compare intubation success rates of paramedics using a novel design of laryngoscope with use of a standard device in a pre-hospital setting.

PROGRESS

*Protocol in development*

**Woollard M**, Lighton D, O'Meara P, Johns I. Airtraq versus standard laryngoscopy used by Australian Mobile Intensive Care Paramedics: a randomised controlled trial

GRANT DETAILS

Application to be made - ? Australian Heart Foundation

BACKGROUND

This study will compare intubation success rates of Australian Mobile Intensive Care Paramedics using a novel design of laryngoscope with a standard device in patients requiring intubation in the pre-hospital setting. Collaborating organisations include New South Wales, South Australia, Queensland, Victoria, Melbourne, and Wellington Free (New Zealand) ambulance services and Charles Sturt and Monash Universities.

PROGRESS

*Protocol in development*