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Research proposal abstracts from the University of Limerick B.Sc. (Hons.) in Paramedic Studies Class of 2017.

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Research Projects

The enclosed scientific abstracts represent final year research proposals of the 2017 graduates who have completed the BSc Hons in Paramedic Studies programme.

Preface:

Education for ambulance personnel has traditionally followed a vocational model, and despite a much wider range of clinical and decision-making skills being introduced in training, typical academic attributes have not formed part of the traditional pre-hospital curriculum.

As with any fledgling profession, core skills such as research, critical appraisal of the literature, journal finding and publication of work still comes as alien to many within the Paramedic arena. In 2015 the Paramedic Studies department of the Graduate Entry Medical School, University of Limerick, launched the inaugural Paramedic Studies honours degree in Ireland. As part of the final year project students are required to identify a research area and prepare a full research proposal, it must of course be founded on sound scientific principles, be well versed and address a true pre-hospital research question.

This document showcases the abstracts of such proposal for Ireland's second cohort of graduates - the 2017 class.

Readers should note these are proposals only. Bodies wishing to support the full development of such proposals are invited to make contact with the Paramedic Studies department whereby appropriate contacts can be made.

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Research Proposal: *Biomechanical analysis of pre-hospital log rolls in maintaining in-line spinal immobilisation*

Author: David Ainsworth

Abstract

Introduction:

Pre-Hospital emergency care in Ireland is predominantly carried out by pre-hospital emergency care council registered practitioners. These practitioners provide care at various levels ranging from emergency medical technician to paramedic and ultimately advanced paramedic. These practitioners provide care and interventions at various levels, but all practitioners encompass the skill of the "log roll" technique.

Spinal cord injuries (SCI) although relatively uncommon are witnessed by Emergency Medical Services (EMS). The potential for aggravation of the injury or secondary injury to occur is possible when moving a patient to a long board or immobilisation device.

The objective of this study is to measure the motion generated when conducting a log roll on a patient's predicts that the study will show significant increase in motion of the vertebrae during the log roll in comparison to the use of an orthopaedic stretcher and other noted techniques in moving patients.

Discussion:

Pre hospital practitioners in Ireland use skills in accordance with their training standards and clinical practice guidelines which are regulated by the Pre-Hospital Emergency Care Council (PHECC). Minimal changes to guidelines would be required to remove the log roll of (SCI) patients as a result of blunt force trauma.

In the author's opinion the orthopaedic stretcher is the superior mean of moving a patient onto an immobilisation device due to its ease in completing, less movement and improved comfort for the patient.

It is the view of the author that the results of the biomechanical analysis will show that the perspective data correlates with literature reviewed.

Methods:

A crew of two paramedics and 3 non-medically trained volunteers will log roll a simulated patient 90° in preparation of immobilisation on a traditional longboard. This will be compared to using an orthopaedic stretcher to move a patient onto a modern immobilisation device, the vacuum mattress. The patient will be marked with biomechanical sensors and relative movement between the sensors will be captured via high speed infrared motion analysis cameras.

Ethical approval will need to be obtained from the Scientific Research Ethics Committee at the University Hospital Limerick prior to starting this research, once ethical approval has been 4

obtained the study will commence. A statistician will also need to be consulted to recommend a sample size that would be sufficient to estimate variability.

Considerations for this proposal should include that the subjects selected for testing are representative of the general population in order to ensure that the study findings are accurate and transferable to a real world setting.

Conclusion:

The removal of the log roll on patients suffering a suspected SCI as a result of blunt force trauma will improve the standard and quality of care, possibly improve the patient outcome for 5

a potentially life changing injury. This could have an impact in the financial cost of care needed by individuals suffering SCI. Further studies are required to ascertain what the most appropriate method which results in the least amount of vertebral motion when loading patients onto longboards or a vacuum mattress. vertebrae and to analysis is this the best techniques for paramedics to use in the pre-hospital environment.

Research Proposal: *Is the labelling of medications causing medication error for practitioners?*

Author: Breda Barrett

Abstract

Appropriate medicine labelling is vital to guarantee safe use of medicines for practitioners. Nonconformity to labelling standards is a potential source of medication errors. This study was envisioned to evaluate, compare and contrast medicine used in the prehospital setting which could cause medication errors due to labelling and the environment practitioners have to work in. A total of 50 Ambulance personnel were involved in a 10 question questionnaire. The Group was made up of 40 Paramedics and 10 Advanced Paramedics.

Using this cohort study, data were collected on the use of labelled medications used in their Drug Bags in the environment they work in. Poor labelling and packaging habitually contribute to medication errors. The print may be less than optimal size, boldness or contrast. High styled graphics of the label may permit the user from identifying the name dosage form or strength of the product. Compiling this information with the environment the practitioners work in was evitable to be a hazard. Complicating this situations even more for practitioners is that the labels are often read in less than ideal lighting conditions e.g. paramedics working at night or poor lighting in houses. Result revealed that majority of the Paramedics and Advanced Paramedics have an issue with the labelling of some of the medication they carry. However, Paramedics have less drugs to administer than Advanced Paramedics. This entailed that the Advanced Paramedics had an issue with drugs that the labelling and packaging looked comparable.

The labelling of medications is problematic for Health care practitioners as they use merchandise packaging and labelling to select the correct medication and dose. Health care practitioners are taught to read labels, to check the right medications, right dose, right route and expiry day. Most claim to do this this routinely, but there is much evidence to the contrary. Proper training and increased awareness is important at all times, attention to the design of drug packaging and the labelling is also important. Poor labelling and packaging frequently contribute to medication errors. Medication error has been highlighted as a significant issue within the healthcare industry and paramedic practice is not immune to this concerning problem. The patient, their family, the paramedic and the health care system are all

affected by the outcome of medication error. (Cohen 2005) As the scope of paramedic practice increases so too does the likelihood of medication error, and for this cause a proactive approach must be developed. The National Incident Management System (NIMS) in Ireland are the reporting system used by the National Ambulance Service for medication errors and all other incidents that may occur, within which environmental and system errors are highlighted and dealt with. Additionally, paramedics must continually develop and be aware of their own self-guided commitment to high standards in clinical practice by following their Clinical Practice Guidelines (CPG) on medication formulation.

Research Proposal: *How many Pre-Hospital practitioners are required to perform Basic Life Support when a LUCAS device is available?*

Author: Bryan Brannigan

Abstract:

Paramedics and Advanced Paramedics have, in recent times, been issued with mechanical chest compression devices for use in incidents of cardiac arrests. The most preferred model, in use by the National Ambulance Service is the LUCAS device. In the pre-hospital field, surplus practitioners despatched to these incidents may prove unnecessary and less beneficial to the services provided, as a whole. While current research indicates that there is no practical advantage to using a LUCAS device, this study aims to look at the issues of necessary resources required when this piece of equipment is available. Several simulated cardiac arrest trials will be conducted with a varying amount of practitioners responding. The trials will serve to examine the roles and responsibilities of the practitioner and how these differ when an additional piece of equipment is available. The trials will measure aspects of a cardiac arrest such as, time to apply a LUCAS device and manual chest compression “hands off” time. This should give pre hospital practitioners a better understanding as to the number of practitioners required to effectively carry out resuscitation efforts on a patient in cardiac arrest, when a mechanical chest compression device is available.

Research Proposal: *Exploring Paramedic's Attitudes and Opinions When Treating Mental Health Patients in Ireland*

Author: Noreen Breen

Abstract

Paramedics form a major part of the emergency response to mental health patients during a crisis. The aim of this proposal is to identify the problems, attitudes and opinions facing paramedics when dealing with patients with mental health illness. A qualitative method will be used by the way of an open-ended semi-structured interview. The study will provide relevant information and lend factual evidence of paramedic's attitudes and abilities in treating mental health patients. The expected results will acknowledge the difficulties faced by paramedics when treating patients suffering with mental illness. And acknowledge a lack of education and training in this area. It may have an effect on practice and policy highlighting these difficulties and their negative consequences. It is anticipated this will educate paramedics on attitudes, bring awareness and possibly introduce a revised education programme.

Research Proposal: *Turbulent Blood Pressure. A study into oscillometric Blood Pressure measurements affected by turbulence experienced during transportation*

Author: Ross Byron

Abstract

Comparative study into the recording of blood pressure during transportation of patients in the Irish Ambulance Service. This study will look at the reliability of noninvasive blood pressure measurements during transport from the scene to the receiving facility. To establish the accuracy of measurements taken using oscillometric NIBP monitors, collecting data of turbulence using an accelerometer which will reflect the levels of motion experienced during transport of a moving ambulance, using data collected from an accelerometer and the lifepak 15 the most common Noninvasive Blood Pressure monitor (NAS, 2016. DFB, 2016) currently been used by the majority of the Irish emergency medical services. Recording data over an eight week period from an accelerometer synchronized such data with the lifepak 15 lifestat technology.

Through this research we would expect to find a variables in blood pressure measurements within a documented turbulent environment. Previous studies have focused on noise rather than artefact caused by motion during transport. By gathering a mean measurement of a 3 axis accelerometer recording (deviation from point 0) this will give us a overall measurement of motion during transport. Comparing this to a static measurement of Blood Pressure taken on scene and finally on arrival of ED. It's expected that during transport allowing the AHA (American Heart Association) BHS (British Hypertension Society) + or - 5 mmHg of variable.

Research Proposal: *What is the mechanical success rate of the Supraglottic Airway Laryngopharyngeal Tube (S.A.L.T.)™ as a blind endotracheal tube introducer in a high fidelity simulator?*

Author: Brian Cornelia

Abstract

Endotracheal intubation is regarded as the gold standard of airway management (Jacobs and Grabinsky 2014). In the prehospital setting however there is conflicting evidence of the benefits of endotracheal intubation airway management. Some noteworthy studies correlate endotracheal intubation in the prehospital setting to increase the rate of mortality and with others the benefits prove its effectiveness. The common link between the two appears to be that endotracheal intubation is a perishable skill and not well practiced in out of hospital use.

The manufacturer of the supraglottic airway laryngopharyngeal tube (SALT) airway offers a solution to laryngoscopy, which could potentially cut out the skill retention for endotracheal intubation. This device specifically made for paramedics claims to offer clinicians a route to blindly insert an endotracheal tube without a laryngoscope. No study has been published to date that shows the success rate of a supaglottic laryngopharyngeal tube (SALT) in a high fidelity simulator. If the results are optimal, high fidelity simulation (HFS) will enable tutors to implement critical clinical scenarios such as that in cardiac arrest without risk to patients assuming future pre hospital human trials are ethically approved and successful.

This prospective pilot study will be a non blinded, one group randomised cohort time trial using a sample size of 27 Advanced Paramedic practitioners. The estimated success rate has a margin of error $\pm 10\%$ and 95% confidence. The projection for overall success rates will be predicted at 92% similar to (Bernhard et al 2012) optimum endotracheal intubation rates.

Research Proposal: *How do Paramedics in Ireland deal with death? "An observational study"*

Author: Richard Crowe

Abstract

Purpose of the research:

The purpose of this research proposal is to gain some understanding of the way Paramedics deal with death. What are their coping mechanisms? We all strive for the right outcome when dealing with patients but as part of our profession we have to deal with death on a more regular basis than most professionals. What is the cost to the Paramedic? Can anyone measure it? Death by its nature is not a pleasant subject, most people struggle to deal with the death of a close relative/friend or a loved one but Paramedics deal with death on a regular basis. What affect is it having on the Paramedic's health, mental as well as physical?

The writer proposes using a survey to gain a better understanding of the effect of dealing with death on Paramedics.

How does the Paramedic and indeed the Paramedic community deal with same? The following may be some of the coping mechanisms used:

- Alcohol
- Counselling
- Dehumanisation
- Denial
- Desensitisation
- Drugs
- Education
- Humour
- Rationalisation
- Suicide (in some more tragic cases)

Past studies have shown that similar coping mechanisms used by Paramedics were also used by other medical professionals (Palmer, 1983).

What can we expect to gain from such a research proposal? Perhaps we can gain a better understanding of the issues raised and possibly an improved way for Paramedics/health professionals to deal with death. From a management point of view, an improved education policy to help new recruits deal with death and/or retraining seasoned Paramedics on issues such as management of feelings.

Research Proposal: *"Cold Comfort"– are Irish Prehospital practitioners addressing Hypothermia in Major Trauma Patients?*

Author: Jamie Dall

Abstract

Background - Hypothermia has been identified as a serious complication in the definitive management of haemorrhaging trauma patients. Clinical evidence shows that early interventions aimed at protecting trauma patients from hypothermia can mitigate against the progression of the "Trauma Triad" and the associated coagulopathy and acidosis. **Aim-** To discover if prehospital staff are aware of the clinical significance of hypothermia in a major trauma patient and are they aware of the effects of interventions to prevent it? **Method-** A prospective anonymous survey of Irish prehospital staff, defined as those registered on the Pre Hospital Emergency Care Council's register at Paramedic and Advanced Paramedic level of clinical practice. Survey questions are designed to capture respondent's knowledge of "Trauma Triad" concepts and the possible effects of prehospital interventions. Survey proposes to target a response from at least 333 staff, from a total population of 2549, to achieve the desired confidence level of 95% **Results-** Survey results may reflect that a significant number of Irish Paramedics and Advanced Paramedics are unfamiliar with the relevant concepts and may not be prioritising the temperature management of major trauma patients. **Conclusion-** Implications for prehospital training? Can improved awareness of major trauma patient "damage control" surgical interventions and hospital care pathways improve the practice of prehospital staff? Very little data exists for prehospital trauma patients in Ireland. Further research and data collection is required.

Research Proposal: *Inappropriate use of the Ambulance Service: Should the National Ambulance Service use alternative care pathways for non-urgent and non-serious calls*

Author: Odette Doherty

Abstract

Introduction:

Reducing unnecessary emergency responses and ambulance transports to emergency departments may produce operational and cost saving benefits for the National Ambulance service. Alternative services such as secondary telephone advice may be more appropriate for low-acuity patients in the first instance. Developing skills of Paramedics to emergency care practitioner (ECP) and paramedic practitioner (PP) level would improve patient management skills. Protocols for non-transportation of patients and treat and refer could produce positive results for emergency services compared to the current practice where all patients are brought to the emergency department.

Methods:

A prospective study involving a questionnaire for Paramedics following calls. Study will be conducted in the west of Ireland in the Galway ambulance service. The aim is to determine the numbers of low acuity patients brought to emergency departments who may have been more suitably treated by an alternative service e.g. GP, primary care center or treat at home with self care advice. The questionnaire will investigate the needs of the patient and the opinion of the Paramedic regarding the need of an emergency response or transport by ambulance to the emergency department.

Results:

Results of this research are expected to mirror many of the studies done in this field internationally where high percentages of inappropriate use of the ambulance service have been found. It is expected that these results will emphasize the need for a change in the way calls are managed within the national ambulance service.

Discussion:

Demand for emergency ambulance services is increasing annually. This proposal identifies the alternative approaches used by Emergency Medical Services (EMS) in other countries. With increased pressure on the service, alternative care pathways for low acuity problems should be studied. International studies have found benefits from offering alternative services to patients. Services in the UK have reported economic benefits and benefits for patients include quicker response times to true emergencies plus high patient satisfaction when attended to by an emergency care practitioner.

Research Proposal: *Where's your head at? A qualitative study into the mental health of paramedics in ireland*

Author: Moya Donnelly

Abstract

Introduction:

Mental health campaigns are being widely promoted in Ireland at present, the issue of suicide and self-harm is a widespread problem affecting all sections of society. This proposed research would look at the mental health of the very people who often attend to those experiencing mental health emergencies: The Paramedic. **Problem:** Mental Health mapping among the Paramedics working in Ireland is uncharted.

Methods:

Free Association Narrative Interviewing (FANI) would, in this research proposal be a secondary tool used with a sample cohort from an initial widespread information gathering model- such as the Impact of Events Scale (IES) style questionnaire distributed to every Paramedic on the PHECC register.

Results:

Maximum Likelihood of the findings will reveal considerable unaddressed mental health issues among Paramedics in Ireland. Psychosocial theories. - if applied to the cohort of PHECC registrants in an initial structured then secondary semi structured study information may shed light on perceived lack of support and non-justice which may be potentially new factors to include in subsequent studies of this nature. If tested further the individual items of the 12-item Impact of Events Survey (IES), GHQ and other formats discussed may lead to a workable baseline.

Conclusion:

The "Where's Your Head At?" study could have extremely positive ramifications for Paramedic practice in Ireland, not only will the gathered data provide an insight into the mental health of Paramedics in Ireland, it will provide a resource to other evidence based researchers interested in examining how the profession of Paramedicine may affect the mental and physical health of the individual Paramedic.

Research Proposal: *Do Paramedics experience levels of Post-Traumatic Stress Disorder?*

Author: Michael Fitzgerald

Abstract

Paramedics have been identified as having the most stressful job of all the emergency services. The causes of stress and Post-Traumatic Stress Disorder (PTSD) in the workplace can be multifaceted. To-day occupational stress is having an increased impact on both the employee and the employer, and is becoming an increasingly global phenomenon. There is an onus of responsibility on health care providers to implement interventions, which will tackle the causes of PTSD in a proactive way. While many studies have been conducted on PTSD, Irish studies are minimal therefore it is timely that further research is undertaken on this topic. There is a gap in the literature and this provides the rationale to conduct this research proposal.

The following research proposal aims to conduct a quantitative study on PTSD in paramedics with the ambulance services. The aim will be to determine if paramedics experience PTSD in the workplace. The sampling frame proposed will comprise of (N=300) paramedics working in direct care in the ambulance service within the Munster region of Ireland. The Impact Event Scale is the data collection tool utilised in the proposal research.

It is envisaged that the research study will add to the body of knowledge and research, and help identify the need for further exploration in this area. Paramedic's experience of PTSD will be highlighted and the findings studied with a view to recommending interventions that aim to combat PTSD in the workplace.

Research Proposal: *Pre-Hospital Nasal Administration: Should the practice of Intranasal medication be more widely used in Pre-Hospital care?*

Author: Brian Hassett

Abstract

The use of intranasal medication has long since passed the experimental stage as a concept of delivery, and has been clinically proven to be effective in administering medication, alongside oral, intramuscular and intravenous methods. According to Dr Tim Wolfe, in his article, *Intranasal Medication Delivery in Clinical Practice- Its Time Has Come*, this process came about at a slow pace, due to the established methods already in use. He notes, that a fear of an influenza epidemic in 2012, led to a large influx of people seeking immunisation against the disease. A large majority of patients were treated via intranasal vaccine, which exposed intranasal medication, and brought about approval for its use to the public. Another reason for the acceptance of the use of intranasal medication is the ease of application, and the low risk of needle stick injuries to the medical profession. (Wolfe, 2012)

Research Proposal: “*Neurological distraction for the Dyspnoeic patient pre-hospital*” *Anxiety increases dyspnoea and lengthens recovery time in exacerbation of COPD and asthma. Can noise cancelling headphones with instructional and relaxing music prehospital, reduce anxiety levels and therefore positively affect recovery rates*

Author: Robert Hogg

Abstract:

Introduction:

Relaxation techniques including music therapy have been well documented in the dyspnoeic hospital inpatient, with varying results. However to the author’s knowledge, following literature searches, this kind of therapy has never been tested on the *pre hospital* patient suffering from exacerbation of COPD or Asthma. The objective of this study is to document the impact music and relaxation therapy can have on anxiety levels and dyspnoea in acute exacerbation in the pre hospital setting.

Methods:

A randomised, controlled pilot study is proposed. This will consist of 40 adult patients suffering from exacerbation of asthma, copd or both. The study will consist of two groups, one to receive music/relaxation therapy via noise cancelling headphones with instructional voice coaxing on breathing techniques, along with traditional medication therapy. The other group (control group) to receive traditional medication therapy only. Each group will consist of 20 randomly selected patients fitting the criteria. It is hoped to have equal numbers of male to female participants. The BORG Scale for dyspnoea levels and Anxiety Visual Analogue Scale for anxiety levels will be recorded, all other readings will be taken from the ambulance monitoring equipment. Data will then be collated and analysed.

Results:

It is anticipated that the levels of anxiety will decrease in the music/relaxation therapy group therefore breaking the “Dyspnoea-Anxiety-Dyspnoea Cycle” (Bailey, P.H 2004). It is also hoped that by achieving

this anxiety/dyspnoea level reduction, that medication effectiveness will improve and that consequently recovery time in hospital will be reduced, in comparison to the control group.

Discussion:

Although many studies have been carried out testing the effectiveness of music therapy *or* relaxation techniques on the asthmatic or copd patient in the hospital setting or at home, to the author's knowledge there has been no research to date to examine the benefits of these therapies *combined* and in the pre hospital environment. One study (Singh, V.P et al 2009) does include acute exacerbation of copd when comparing music versus relaxation therapy, however again, in the hospital environment. It is hoped that with positive results gleamed from this pilot study, more research into alternative therapies for dyspnoea and/or anxiety in the pre hospital environment will be undertaken.

Research Proposal: *Should Irish paramedics treat nausea and vomiting with oral anti-emetics?*

Author: Anthony Horace

Abstract

Introduction:

Is there a need for the prehospital practitioner to be able to administer oral anti-emetics? There has been some research around the world in the use of anti-nausea drugs, most research is done in chemotherapy patients and in post-operative nausea and vomiting in hospital settings.

Methods:

We will examine the research from around the world analysing the effectiveness of different anti-nausea medications.

Methods/Results:

I conducted a small survey and we will see that prehospital providers feel there is a need for anti-emetics prehospital and we will see there is some discussion on what is the best route to administer such drugs/medications.

Discussion:

Nausea and vomiting is the body's way of getting rid of toxins and telling us that something is not right. There is some discussion on whether they might be beneficial or not in the prehospital setting, so there is a question around the benefits of blocking the body's natural response. We will conclude that there may be a need for oral anti emetics pre-hospital.

Research Proposal: *Routinely is there a discrepancy between pre-hospital temperature observations and those taken at triage in-hospital?*

Author: Teresa Hudson

Abstract

Introduction:

Measuring temperature is one of the oldest physiologic assessments dating back to days of Hippocrates circa 460-375BC, when the hand was used to detect changes in heat of the human body. Progression in science and medicine has cemented the importance of measuring temperature as a central role in diagnosis and treatment of a patient.

Today, of all the instruments and tools regarded as essential in clinical examinations the thermometer is the diagnostic tool considered to have the most widespread application. (Pearce, J.M.S., 2002).

There is a main volume of research on measuring temperature in a hospital setting is particularly in the field of anaesthesia (Dyer et al., 2009). There is evidence to suggest that the area has been largely under investigated in nursing discipline despite advances in clinical diagnostic equipment (Evans & Kendra 2006) which possibly suggests a general complacency in the area. Other studies investigate the importance of accuracy, consistency, validity of measurement site, array of diagnostic tools available, and the implications for medical diagnosis and treatment. (Sund-Levander et al.,2013).

Conversely there is a dearth of valid research on temperature measurement in a prehospital setting. The approach to such measurement would appear to be more of a dogmatic than pragmatic nature.

Factors that are irrelevant in a controlled hospital setting present themselves in the pre-hospital environment that may influence the accuracy of observations obtained. The author hypothesizes these may include device limitations, the ambient temperature, the location of the patient, barriers to gaining readings, consistency with the use of the thermometer and where the thermometer is stored within the Ambulance. 3

The author believes there is an opportunity to complete a proof-of-concept study by seeking to qualify if there is a trend of unexpected/unexplained differences between pre-hospital and in-hospital triage temperature observations.

Methods:

A full set of vital signs are recorded during the secondary survey of the medical and trauma patient. (PHECC CPG 2014) These observations are repeated at intervals to identify trends and/or the success of interventions made that can affect these physiologic readings. The diagnostic tools used by paramedics and advanced paramedics are restricted to those provided by their individual service. Currently the Infrared Ear Thermometers (IRET) are the instrument of choice (brands vary across the sector) with a secondary choice / back up of disposable single use foil thermometers containing liquid crystals. This is based on best practice in other areas of the medical profession. A survey will be carried out by a researcher in the A&E following handover protocol (IMIST AMBO) (**Appendix 1**) with the attending practitioner. They will also record the temperature recorded by triage nurse at initial assessment.

Expected Results:

This author expects to find some variance / discrepancy between temperature observations pre hospital and at triage. Recording a number of specific data points will allow the factors that may influence this variance / discrepancy will be quantified and presented. Disqualifying criteria will apply where specific interventions have been made to alter patient temperature during transit – example administration of anti-pyretic, active rewarming of hypothermic patient or active cooling of post ROSC patient. 4

Discussion:

Where a variance / discrepancy has been identified this may justify further research into the area of measuring temperature pre-hospital, with a view to improving practitioner guidelines and patient care. Ultimately a variance represents an increased risk to the patient and if this is the case then we are obligated to investigate measures to mitigate this.

Research Proposal: *Would Point of Care Troponin Levels Pre Hospital be feasible in Ireland? A Clinical Research Proposal of Non Traumatic Chest Pain Patients in the Kerry & Cork Region*

Author: Mary Jones

Abstract

Pre hospital cardiology is an emerging field in Ireland. There have been substantial changes in recent years in how patients with chest pain are treated by practitioners and transported to specialist cardiac centres instead of the local emergency department. These changes have seen improved patient care and outcomes.

Recent European guidelines and studies suggest that practitioners should not be relying solely on ECG interpretation for the diagnosis of Acute Coronary Syndrome (ACS) but should also be incorporating point of care (POC) biomarkers that are used in the hospital setting such as Troponin into the diagnosis.

With this proposal I hope to undertake a clinical review of patients suffering with non traumatic chest pain and brought to the emergency department by ambulance. From which I hope to prove that by including POC troponin testing to patients with chest pain we can improve practitioner confidence in treating patients, further improve patient outcomes and reduce costs to the Health Service Executive (HSE) by saving unnecessary patient transfers and instead transporting the patients with non ST elevation MI (NSTEMI) direct to a cardiac facility.

Research Proposal: *Are there benefits to paramedics using Continuous Positive Airway Pressure (CPAP) for patients with respiratory distress?*

Author: Frank Kane

Abstract

At this time, in some parts of Ireland, Paramedics use Continuous positive airway pressure (CPAP) for patients with Congestive heart failure.

This proposal is to show how easy it is to train all Paramedics in the use of (CPAP) for the treatment of many other conditions associated with respiratory distress.

I shall do this by using cited articles and research material, peer reviews and examining the results, and trials carried out by other Emergency Paramedic services from around the world.

A survey was conducted using a ten-point questionnaire with Paramedics to get their point of view of the use of (CPAP) and its effectiveness from those who have used it.

In conclusion, it is beneficial to use (CPAP) in the Pre Hospital Emergency Care setting, for respiratory distress. Showing how the device can be used to benefit patients and how the benefits of (CPAP) outweigh the discomfort of the tightly fitted mask.

Research Proposal: *Do Reusable Pulse Oximeter Probes Pose a Significant Risk for Cross Contamination in the Prehospital Setting?*

Author: Brendan Kavanagh

Abstract

The continued prevalence of hospital acquired infections, and increasing levels of antimicrobial resistance is extremely concerning, and their eradication must continue to be a priority. Poorly cleaned and disinfected medical equipment has been shown to harbour potentially lethal microorganisms for days or weeks, increasing the risk of cross contamination. Prevention of transmission is a key element in protecting patients, both during their admission and also during their prehospital treatment. The risks of hospital based contamination have been widely studied but there is limited research into role played by prehospital contamination. A cluster randomised study will be undertaken to test reusable pulse oximetry finger probes for microbial contamination, and to establish if microorganisms that are known to cause nosocomial infections are present. International studies have found high levels of contamination on equipment and surfaces in hospitals, with similarly high contamination rates being found in ambulances. If similar results are achieved from a study of reusable finger probes in Irish ambulances, then it seems clear that they pose a substantial risk of cross contamination, which will warrant a review of cleaning and disinfection practices for reusable rules oximeter finger probes, and perhaps all reusable equipment, used in the prehospital setting.

Research Proposal: *Barriers to Prehospital Pain Management*

Author: Robert Kerrigan

Abstract

Introduction:

Pain is still seen as one of the most challenging aspects of the prehospital environment, with the vast majority of emergency medical services calls dealing with a patient who is experiencing pain of some description. While the area has been well researched over the past number of years, oliganalgesia is still a problem within the prehospital setting. The purpose of this study is to look at practitioners attitudes to prehospital analgesia and to examine if previously found barriers are still present or if new barriers have emerged.

Methods:

A qualitative study will be undertaken for this research and the use of focus groups will take place around the country to include both paramedics and advanced paramedics and will be carried out until data saturation has been achieved.

Results:

The data will be broken down into themes so that analysis can be carried out as follows, age, gender, ethnicity, practitioner experience, patient assessment, current clinical practice guidelines and medications as well as concern for masking illness or injury. The ability to accurately assess a child as well as lack of experience when dealing with children, cultural background and language barriers as well as the lack of fast acting medications for paramedics when dealing with severe pain are all included within the expected results.

Conclusions:

While the area of prehospital pain management has changed over the past number of years, this does not appear to have much of an effect on the patient's pain. Changes to current clinical practice guidelines need to be made to allow paramedics (who make up a large percentage of prehospital practitioners) utilise a wider range of fast acting analgesics. Also, education and training need to

incorporate more training on an ongoing basis for pain management, especially for the assessment on both adults and children who are experiencing pain.

Research Proposal: *Could prehospital troponins be used to access PCI in NSTEMI?*

Author: Kevin Lyons

Abstract

The purpose of this evidence based research proposal is to assess the need for prehospital troponin testing in a chest pain patient and to determine the best practice guideline for early detection and treatment of MI. This complaint presents itself quite frequently to the prehospital provider. According to White and Chew, (2008):

- i. More people have non ST elevation myocardial infarctions (NSTEMI) a year then ST elevation myocardial infarctions (STEMI).
- ii. On a global level, Four million NSTEMI and Three million STEMI are recorded annually.

With this in mind the author has put this topic forward for evaluation. The evidence seems to suggest in favour of prehospital troponin testing and this research proposal title. The current literature studied and analysed does not have a solid amount of literature to challenge the argument against prehospital testing of troponins. This proposal analyses the current literature and elucidates a detailed plan on how further research is to be conducted and recommends other areas for further research.

Research Proposal: *Can effective Cardio Pulmonary Resuscitation (CPR) be performed while being winched to a Rescue Helicopter?*

Author: Conal Mc Carron

Abstract

Aim of the study:

Search and Rescue (SAR) operations which include mountains, lakes, inaccessible areas or at sea often present helicopter SAR crews with unique challenges. One of the most challenging problems is the management of a prehospital Cardiac Arrest (CA) patients during evacuation and transport.

It is not possible to maintain continuous and effective manual cardiopulmonary resuscitation (CPR) while being winched to the rescue helicopter. Currently in Ireland, the United Kingdom (Griffiths, 2015) and the United States of America (NSARA, 2013) CPR is discontinued during the winching phase of a helicopter rescue. In an effort to overcome this problem, the AutoPulse™ automated mechanical CPR devices will be used to conduct a simulation study to clarify the efficacy of AutoPulse™ in a cardiac arrest scenario while being winched into a hovering search and rescue helicopter. A comparison will then take place between the efficacies of the AutoPulse™ in a cardiac arrest scenario, while stationary on the ground and while being winched to the helicopter, using a simulation study performed on a manikin.

Methods Overview:

A total of 36 Winch Crew will be enrolled in this study. Irish Coast Guard (IRCG) helicopters are crewed by full time employed and registered PHECC practitioners, ** Note 1. The winch-crew will perform winching lifts to the IRCG Sikorsky S92 rescue helicopter which will be hovering at forty feet in varying wind speeds and directions, using the Laerdal SimMan® 3G manikin, Zoll AutoPulse® Resuscitation System, Goodrich Hoist and the Medevac II 404 Rescue Stretcher.

** Note 1: IRCG contracts helicopter rescue services from a third party (CHC Ireland). All references to IRCG helicopter crews or staff relate to CHC Ireland.

Results:

Results hope to show, that good quality CPR can be administered to a casualty while being winched to a rescue helicopter, using a mechanical CPR device. Which in turn minimises the time which CPR would be discontinued during the winching phase, described as "hands off time". These results will determine the quality of CPR provided while suspended under a rescue helicopter between one and forty feet. Then these results can be compared to the quality of CPR provided while stationary on the ground. The results will aim to show if the quality of CPR is affected by the downwash from the helicopter, the wind speed and direction and if it has any effect on the CPR quality. The CPR quality should meet the 2015 guidelines for Adult Basic Life Support and Cardiopulmonary Resuscitation (Kleinman et al., 2015).

Conclusion:

This paper will outline the difficulties in extracting and transporting a person in a cardiac arrest in a remote area or at sea, who needs to be winched to a search and rescue helicopter in order to be transported to hospital and while cardiopulmonary resuscitation (CPR) is being performed.

There are studies to show that a mechanical CPR device provides better compression rate, depth and reduces the "hands off" time in a cardiac arrest in a restricted environment (Kim et al., 2016). This ultimately provides a better outcome for a patient when applied during transportation to hospital in either a land ambulance or air ambulance. There is currently no research into whether a mechanical CPR device provides adequate chest compression while the patient is being winched to a helicopter.

A Zoll AutoPulse® mechanical chest-compression device has been used in previous research to show the quality of CPR while being transported to hospital. This research will be used to do a comparative study between mechanical CPR on the ground and while suspended from a helicopter using the Medevac II, 404 Stretcher manufactured by Lifesaving Systems Corp. (LSC) along with the Laerdal SimMan® 3G, the SimMan® 3G will record the data and provide feedback as to the quality of the CPR and the effects of the helicopter downwash, along with being suspended in mid-air on the quality of the CPR.

Keywords:

Rescue Helicopter; Cardiopulmonary Resuscitation; Winch; Search and Rescue; Mechanical CPR; Downwash.

Research Proposal: *Improving Child Safety in Ambulance Transportation. Does Isofix points provide a better anchorage platform than Current NAS Guidelines for Transporting Infants?*

Author: Marguerita McManamon

Abstract

Objective:

Safe transportation of children by ambulance presents special challenges for emergency medical service providers. Effective restraint is dependent not only on the child restraint equipment used, but also on the platform to which it is attached.

This study will investigate the efficacy of Isofix points versus the Pedi-Mate Ferno harness and Baby Pod II, the latter being the current methods for transporting Infants advocated by the National Ambulance Service (NAS), even though they are deemed illegal when used in a car. The proposal to secure a child in a child seat with Isofix points would bring ambulance transportation of young children in line with current legislation regarding children in vehicles. This study is aimed at children under 2 years old.

Proposal:

This proposal will evaluate four types of child restraints available in ambulances utilising experimental scenarios and a questionnaire. A larger study would be preferred, however, due to time restraint this would not be feasible.

48 National Ambulance Service Paramedics will effectively restrain a manikin infant, in a Mercedes Benz Sprinter (906) ambulance, during the following 4- child safety scenarios: Baby Pod II, secured to a Pegasus stretcher as per manufacturer's instructions: Ferno Pedi-Mate, secured to the Pegasus stretcher as per manufacturer's instructions: built-in child restraint system fitted on the captain's chair as per manufacturer's instructions: Infant's own rear-facing child safety car seat with top tether/foot prop secured to Isofix system fitted on the forward facing Jany 862/R14 ambulance seat with seat back upright and in forward facing position. The questionnaire consists of 14 questions.

Results:

The following methods will be used to evaluate the results of the questionnaire.

I would perform a one way Anova, to test if there was any significant difference in time between the groups, for example, compare the time it took to secure the child seats and to investigate which one is the quickest.

Research Proposal: *One Cuff Or Two? An In Vitro Study Comparing Intra-Cuff Pressure Changes Of An ETT And A King LT AT Altitude Using An Airway Trainer*

Author: John McShane

Abstract

Introduction:

Aeromedical and Helicopter Emergency Medical Services (HEMS) are an increasing asset across most European countries; Ireland is no different. Ireland has numerous aircraft from various state agencies at its disposal to assist in the transportation of critically ill or injured patients to hospitals; both at home and abroad. Aeromedical and HEMS services are usually associated with getting advanced care to patients quickly and transporting those patients to a care facility in a fraction of the time of a road ambulance, leading to a reduction in morbidity and mortality. However, what if it was suggested that aeromedical transportation may cause a specific group of these patients to have associated complications due to their mode of travel and which may even increase patient mortality rates because of treatment trends provided.

Methods:

Tracheal mucosa damage is a common finding in patients who have been intubated using Endotracheal Tubes (ETT) which have been in situ for only 15 minutes. One of the main reasons for tracheal mucosa damage is absent monitoring of intra cuff pressures. Pressure changes of >30cm H₂O within an airway cuff are associated with several tracheal complications including tracheal rupture. The proposed research is to study two types of airway devices found in use by the Irish Aeromedical Services and compare their characteristics at altitude. The single cuff Endotracheal Tube and double cuff King Laryngeal Tube are the two devices which will form the basis for the research.

To demonstrate how altitude affects these two airway devices, it is intended to conduct the study on board an Irish Coast Guard Sikorsky S92 to a maximum altitude of 5000 feet (Ft). The study will involve the insertion of both the King LT and ETT into an airway trainer to simulate an actual patient prepared for aeromedical transport. Measurements of intra cuff pressure changes will be recorded using a pressure manometer and digital calibres every 1000Ft.

Results:

We anticipate that based on "Boyle's Law", the results of the ETT and King LT will demonstrate increased intra cuff pressure at altitude. However, the results regarding at what altitude the dual cuff design of the King LT will affect surrounding tracheal and laryngeal structures, is unknown, as no data is currently available in Ireland.

Discussion:

The ETT and King LT airway devices are authorised for use by PHECC Practitioners in Ireland but little is known of the hidden dangers they pose on patients considered for aeromedical transportation. Uncontrolled cuff expansion can lead to life threatening conditions such as a tension pneumothorax and pneumomediastinum (air between the pleural surface both lungs). Research on how altitude affects the ETT and King LT is an important tool in educating PHECC Practitioners about these preventable dangers.

Research Proposal: *A pilot study to ascertain if an educational information session to ambulance personnel, in relation to the use of peak flow metres, will increase its usage pre hospital*

Author: Emma Nelligan

Abstract

Introduction and Importance:

This is a pilot study, In which the aim is to examine the rates of compliance of practitioner's usage, of Peak Flow meters (PFM), within the Irish National Ambulance Service (NAS).

An online informative session will be provided to highlight the key role peak expiratory flow rate (PEFR) plays within an objective respiratory assessment; the information this provides, and why this information is essential in the treatment pathway of the patient. The author questions will this new increased awareness result in an increased usage.

Methods:

Participants were sent a short online information session, which will be presented in PowerPoint with a voice over and a YouTube video clip with a paramedic coaching a person on how to get maximum benefit from using the peak flow meter.

The first survey filled in before the online information session will gather participants past and present opinions and usage trends of PFMs.

The follow up survey immediately after the online session will capture if the subject's mind-set has changed, and if they are likely to change their practice.

It will also reiterate the authors key learning objectives within questions.

The third and fourth surveys sent two months and six months following, will track if there is a continued trend in attitude and compliance. Research Proposal Peak Flow Meter Compliance

Results:

The author hypothesised that there will be an initial change in perception and desire to introduce PEFr measurement into their regular practice. However, the author expects the initial change in attitude and compliance will falter with time, and by the fourth survey this will have lessened. However, the author envisages the filling in of the appropriate section in the patient care form to be continued

The author predicts a difference between the rural and urban stations and wonders if the shorter travel times will impact practitioners desire to complete the PEFr measurements.

The author further wonders that with longer call times resulting in a less volume of patients contact, will the rural practitioners get a chance for the routine of taking a peak flow measurement become implemented.

The author expects practitioner's length service, to play a role in participation and change in level of compliance; with newer members being more open to change.

Discussion:

Does providing a person with more knowledge on a subject; result in an increased respect and this equates to a compliance to practice. This was the result with inner city families who became more efficient in using their asthma equipment and pursuing an asthma action plan after being educated by trained lay volunteers, following an admission to hospital (Rice et al, 2015). How does the employer ensure that this new compliance continues into the future as a routine part of the practitioner's practice?

Research Proposal: *Paramedic's and the Health effects of Shift Work. A prospective observational cohort study to assess the health implications associated with shift work*

Author: Pdraig O'Connor

Abstract

Shift work including night shift has been linked with an increased risk of chronic diseases including cancer, cardiovascular disease, metabolic syndrome and diabetes. Numerous studies have been carried out investigating the effects of shift work among various working groups in society however there are a limited number of studies investigating the effects of shift work on paramedics. This study hypothesises that amongst ambulance service personnel there are a wide range of health implications associated with shift work.

Methods:

A prospective observational cohort study to be undertaken by the National Ambulance Service in the South West region of Ireland. The Instrument used for data collection will be the 'Standard Shift Work Index'. This self-report questionnaire will be administered to participating ambulance personnel within the South West region of Ireland.

Conclusion:

Shift work can affect health and well-being on a variety of levels both physiologically and psychologically affecting aspects of work and personal life. Interventional methods for shift workers health and quality of life as a result of adverse effects of shift work are needed.

Research Proposal: *Can PHECC Registered Paramedics and Advanced Paramedics Acquire and Interpret Focused Cardiac Ultrasound Images to Identify Cardiac Motion: A Feasibility Study*

Author: Stephen O’Flaherty

Abstract

Introduction:

The ability to cease resuscitation on Patients suffering Out of Hospital Cardiac Arrest is limited to those patients in asystole who fulfil certain criteria. The utilisation of ultrasound to make a focused examination of the heart in cardiac arrest to identify cardiac motion may allow PHECC registered Paramedics and Advanced paramedics to cease resuscitation in other rhythms such as PEA and perhaps reduce the time resuscitating futile cases of asystole. This study will aim show if PHECC registered Paramedics and Advanced Paramedics can acquire and interpret cardiac ultrasound images to determine if cardiac motion is present.

Methods:

This Study will be a prospective observational educational simulation study. A cohort of PHECC registered Paramedics and Advanced Paramedics will undergo 2 hours of training in focused cardiac ultrasound to identify cardiac motion. After the training participants will be asked to acquire Ultrasound images on each healthy volunteer in both the Sub-Costal and Parasternal Long views without assistance. These views will be rated for adequacy and the time taken for the view to be acquired will be recorded. This image acquisition will be followed by an image interpretation exam to investigate if the participants can identify if there is cardiac motion or not from a 6 second clip.

Results:

It is anticipated that a cohort of PHECC registered paramedics and Advanced Paramedics will be able to acquire and interpret Focused Cardiac ultrasound images. Other studies have shown that some EMT –

Basic, Paramedic and Army Medics have successfully been trained to acquire and interpret focused ultrasound images to identify cardiac motion for utilisation in cardiac arrest.

Discussion:

The particulars of this cohort will be of interest to see if there is any individual quality that participants require to be able to perform this focused ultrasound exam to confirm if cardiac motion is present or absent. In the UK the skill of Ultrasound use and interpretation sits with the Advanced/specialist paramedics most of whom are trained to Masters level. It is not known if this is an educational requirement or if there are other external factors. The utilization of Focused Cardiac Ultrasound in Cardiac Arrest will add another level of care available to patients in OHCA who require more care to treat the cardiac arrest or recognise futile efforts and perhaps avoid unnecessary lengthy cardiac arrests.

Research Proposal: *CPR Fitness! Can two minutes a day help keep mortality at bay?*

Author: Peter O'Neill

Abstract

Introduction:

Survival rates from cardiac arrest remain low. Why is this, when evidence based guidelines make recommendations for improved CPR? Research shows CPR from health care professionals rapidly becomes ineffective. Rescuer fatigue is a factor that exists during CPR. Other than acknowledgment of this, and rotating CPR provider between cycles nothing has been done to combat this fatigue effect. This proposed RCT tests the hypothesis that with short duration regular training, provision of effective CPR is achievable for longer periods and is less fatiguing on the rescuer.

Methods:

A randomised controlled trial using student paramedics and medical students. Control (n=15) and intervention (n=15) groups were tested till failure in the provision of adult CPR. Standard deviation=7.25. Smallest significant difference = 1.18. This enabled $P < 0.1$. Data collection of CPR rates and depths by Laerdal Simman 3G and rating of perceived exertion using Borg's 15 point VAS obtained every two minutes. Intervention group continues with 6 week, 5 days per week, two minute mannequin based CPR fitness training. Simulation repeated.

Results:

With a confidence interval of 90% a CPR fitness programme proved to be a significant factor. Results showed all intervention subjects displayed greater durations of effective CPR. In total, subjects displayed longer durations of effective CPR over one standard deviation higher than the control group. Post-intervention analysis data indicates a lesser perceived rating of exertion when measured to baseline comparison.

Discussion:

CPR fitness training shows benefit to patient and provider. With training longer duration of effective CPR can be administered, having the potential to improve survival of cardiac arrest by reducing exertion and fatigue. This study found benefits to both patient and practitioner with a relatively small cohort. Further studies of larger populations should be considered.

Research Proposal: *Comparison of the Airtraq and Macintosh intubation techniques, in a controlled, non-clinical manikin study: Pre-hospital Intubation: In a comparative study, is the indirect Airtraq guided intubation technique superior to the current direct laryngoscopy standard, using a Macintosh laryngoscope?*

Author: Carmel O’Sullivan

Abstract

Direct laryngoscopy with the Macintosh laryngoscope is the current tracheal intubation technique used in Ireland by Advanced Paramedics. This is a difficult technique to learn and remain adequately skilled in, unless frequently practised. Failed attempts, repeated and prolonged attempts, misplaced endotracheal tubes can all result in systemic complications, such as hypoxia, which can have significant repercussions on patient outcomes. Indirect laryngoscopy, with a device such as the Airtraq, facilitates easier tracheal intubation as unlike the Macintosh, it does not require the difficult task of aligning the oral, pharyngeal and tracheal axes.

Research on the subject of tracheal intubation is extensive and studies relating to pre-hospital are conflicting. Tracheal intubation is considered the gold standard of airway management, as it provides a definitive airway. However, studies have indicated that in the pre-hospital setting, practitioners may not receive appropriate initial training in tracheal intubation and subsequently due to infrequent exposure, inadequate training opportunities and difficult work environments may potentially lead to prolonged attempts, unrecognised complications and compromised patient care.

This proposed research study aims to compare the indirect Airtraq guided intubation technique to the current direct laryngoscopy standard, using the Macintosh laryngoscope. The proposal is to conduct a comparative, controlled, non-clinical manikin study using novice participants, who have never received any training in tracheal intubation to compare the devices.

The study expects to find that when used by novice users, the Airtraq is easier to learn and use over the Macintosh resulting in more successful tracheal intubations, with less time to intubation and fewer misplaced endotracheal tubes.

Very few pre-hospital clinical trials exist comparing these devices. If the results from the manikin study suggest that the Aitraq has potential benefit in improving patient outcomes by facilitating easier learning and performing tracheal intubation by practitioners pre-hospital, then it may act as a catalyst for justifying the need to perform pre-hospital clinical research in this life-saving skill.

Research Proposal: *Should recommended pre-hospital practice be amended to require the use of the Vacuum Mattress Splint in the immobilisation of hip and pelvic fracture injuries, regardless of the level of trauma? A Prospective Trial or Assessment to Determine if the Vacuum Mattress Splint should be used for immobilisation of Hip and Pelvic fracture patients, regardless of the level of trauma*

Author: Terence Phair

Abstract

Appropriate and effective immobilisation and transportation in prehospital care is one of the critical decisions in the delivery of personal patient specific emergency medical treatment. Current Pre-Hospital Emergency Care Council Guidelines recommended use of the Vacuum Mattress Splint (hereinafter referred to as the 'VMS') device in pre-hospital emergency medicine is limited to cases of spinal injury or suspected spinal injury. It is also always used in cases of high trauma whereby due to the level of trauma suffered a spinal injury simply cannot be ruled out. There has been extensive research into the use of the VMS mechanism, particularly research comparing it to the use of a "spinal board" or "back board" in cases of spinal injury. Much of this research examines the VMS on various grounds and its findings have noted some very significant benefits to the use of the VMS, making it quite a superior instrument of immobilisation. The studies which have been carried out into the pre-hospital treatment of hip and pelvic fracture patients have highlighted the importance of full patient immobilisation and they have highlighted numerous critical reasons for the prevention of movement. Research has also noted the prevalence of such conditions amongst the elderly. This proposal postulates recommended pre-hospital practice be amended to require the use of the Vacuum Mattress Splint in the immobilisation of hip and pelvic fracture injuries, regardless of the level of trauma. As mentioned, the VMS is currently always used in the treatment of high trauma patients and so the VMS is always automatically used in the immobilisation of high trauma patients presenting with hip and pelvic fractures. This proposal therefore postulates recommended pre-hospital practice be amended to require the use of the Vacuum Mattress Splint in the immobilisation of hip and pelvic fracture injuries, regardless of the level of trauma 4

Method:

This proposal purports a prospective study be carried out across two National Ambulance Service Regions: one of mainly rural composition and the other, a metropolitan region. The trial proposed would assess the effectiveness of the use of the VMS in the immobilisation of patients presenting with hip and pelvic fractures as a result of low level trauma and would compare this on identical grounds to the current practice.

Conclusion:

The vacuum mattress may serve as an effective tool of immobilisation in the delivery of pre-hospital care in the case of hip fractures and pelvic fractures suffered as a result of low level trauma. It's use may be an extremely effective yet low cost advancement and improvement in the immobilisation of such injuries. It may greatly advance this area of pre-hospital care, minimise risk to patients, improve recovery, and reduce the risks of mortality in such cases. This therefore warrants further exploration by way of clinical study.

Research Proposal: *A simulated study into the performance of an infrared tympanic thermometer in room temperature over time after being exposed to a cold ambient environment*

Author: Declan Power

Abstract

The Infrared Tympanic Digital Thermometer (IRTT) is widely used across the EMS system for the pre-hospital temperature measurement. Research shows that its accuracy is affected when it is subjected to cold ambient conditions prior to use. The aim of this study was to test how long it took for an IRTT to measure accurately in room temperature after being subjected to cold ambient conditions.

Method: two Braun ThermoScan IRT 6020 were used: one, the control device, maintained at room temperature (21 °C); the other, the test device, refrigerated to 2.5 °C (average winter temperature).

Then, they were tested using a Welch Allyn 9600 plus Calibration Tester over three simulated core temperatures settings: low, middle and high (36 °C, 38.5 °C and 41 °C, respectively); every 5 minutes for 35 minutes.

Results: descriptive analysis of predicted results showed the control device stayed within the acceptable margin of error ± 0.2 °C for duration of test. However test device showed no baseline reading. After 15 minutes, it approached acceptable error margin and optimal readings achieved within 30 minutes.

Conclusion: IRTT device showed poor initial performance after exposure to cold environment, but accuracy improved after 15 minutes in room temperature.

Research Proposal: *'The Paramedic will see you now'- Expanding the Paramedic scope of practice within the rural GP setting in Ireland*

Author: Emmet Quann

Abstract

Introduction:

The commitment and dedication given by GPs serves their patients well but with growing demands, an ever ageing population and increasing waiting times, the pressures exerted on GP practices in recent years could have adverse effects on both patient and GP welfare and the service provided. With the introduction of graduate entry degree programmes tailored towards paramedicine, it is highly tenable to suggest that paramedics may work alongside GPs to enhance patient care. The aim of this proposal is to explore GPs' views on the introduction of paramedics within primary care and to see if it is part of a viable solution to the ever increasing pressures on healthcare provision.

Methods:

This was a questionnaire based quantitative research proposal involving four GP practices in the South East of Ireland. Questions relating to the implementation of Paramedic Practitioners (PPs) within general practice, cost effectiveness and clinical competency were included. Eligible GPs received an information sheet, a consent form, a concise questionnaire and assurance that their response was voluntary and would remain anonymous. Participants were asked to read and sign the consent form and complete and return the questionnaire within six weeks. Data was analysed using a simple excel spreadsheet.

Results:

All four GPs believed that the implementation of PPs in General Practice would be a positive addition to both a multi-disciplinary primary care team and the rural community. GPs did not envisage an issue with patients being assessed by a PP rather than a GP or practice nurse and considered paramedics to be competent in making clinical decisions and in assessing, monitoring and treating patients. All GPs agreed that having a qualified paramedic employed in their surgery could increase overall confidence in dealing with pre-hospital emergencies, but that the concept required further research and evaluation in the areas of training and funding.

Conclusion:

GPs see paramedics as having an important role within the primary care setting and are prepared to help them to fulfil this role. There is increasing pressure on all aspects of the health system particularly in Emergency Departments (EDs). The introduction of a PP within the GP setting could help alleviate such pressures, convey considerable benefits for both patients and GPs and reduce overall ED attendances. As an evolving profession, the paramedic's role has developed from an 'ambulance driver' to a degree level healthcare practitioner. In tandem with an ever-changing healthcare system, we are seeing a more integrated approach with fellow degree level healthcare professions. However there remain several hurdles to overcome in which further research is warranted.

Research Proposal: *Pre-Hospital use of Point-Of-Care Capillary Ketone Testing for Early Recognition of Diabetic Ketoacidosis*

Author: Paul Quinn

Abstract

Objective:

Diabetic Ketoacidosis (DKA) is a condition suffered by diabetics due to an absolute or relative deficiency in insulin. DKA is a medical emergency that can incur significant mortality if not diagnosed and treated promptly. The aim of this study is to assess the prevalence of DKA amongst pre-hospital hyperglycaemic patients using Point of Care (POC) ketone testing to identify DKA sooner than current practices.

Methods:

All patients encountered by ambulance staff from 3 ambulance stations in the National Ambulance Service (NAS), who have a Blood Glucose Level (BGL) >11.0mmol/l will be tested for ketones using a POC blood ketone meter.

Results:

Results recorded will be analysed and comparisons will be drawn to determine if the use of ketone testing identifies patients suffering with DKA and from this any patients at risk of DKA that are not captured by current CPGs (BGL <20mmol/l and β -OHB >1.5mmol/l)

Conclusion:

This is the first study of its kind within a pre-hospital setting relating to this topic. Similar in-hospital studies have demonstrated positive results, and it is expected that it will identify a number of patients earlier allowing for earlier intervention.

Research Proposal: *"Are prescription or over-the-counter medications contributing to opioid overdose in Dublin City?"*

Author: Eithne Scully

Abstract

Introduction:

The management of chronic pain in selective patient populations often dictates the use of opioid therapy. However, increased misuse and abuse of prescription opioids resulting in serious personal health consequences such as addiction, mortality due to opioid overdose, polypharmacy use and injection drug use has led to public health concerns. Pre-hospital practitioners utilise naloxone to reverse the potentially fatal consequences of opioid overdose. A perception exists that this drug is used mainly in cases of illicit drug overdose. Currently, little evidence exists in Ireland as to the role of other prescription and non-prescription opioids in overdose despite an increasing trend in their use. This study, therefore, aims to ask the question; ***"Are prescription or over-the-counter medications contributing to opioid overdose in Dublin City?"***

Methods:

This is a prospective observational cohort study involving paramedics and advanced paramedics in Dublin Fire Brigade. Using inclusion criteria of naloxone administration, practitioners will complete data collection logs in cases of opioid overdose. Data collected will include patient demographics and concomitant medication as a means to identify any association of prescription or over-the-counter medications with potential risk factors for overdose.

Results:

Demographic and medication data will be analysed to identify possible trends and identify any association between concomitant opioid medications and overdose. Eithne Scully Pre-hospital Research Proposal 15080986

Discussion:

The study question has identified a current gap in research and any evidence collected that suggests a possible conclusion or opening for further research will prove invaluable in the management of pre-hospital opioid overdose. This will have implications for both paramedic practice and raise awareness of a currently underestimated potential cause of opioid overdose.

Research Proposal: *Temperature – Is "low" acceptable. A quantitative research study to determine if tympanic thermometers currently used by EMS in Ireland are fit for purpose*

Author: Davitt Ward

Abstract

Introduction:

Pre-hospital practitioners regularly treat patients with hypothermia. Practitioners use a standard tympanic thermometer to record low temperatures. Device lower limit displays "low" or "lo". This non-specific display may not be adequately low enough for severe hypothermia. With no numerical value, "low" or "lo" can range from 34°C to 20°C. Are practitioners appropriately equipped to treat these patients?

Background:

Paramedics and advanced level, Clinical Practice Guidelines (CPG's) were revised in July 2014, there was significant changes to the hypothermia clinical pathway, Practitioners are expected to accurately record body temperature below <30°C.

Aims:

This study intends to establish if emergency medical services (EMS) are appropriately equipped to deal with a severely hypothermic patient in Ireland. The research will also identify if a national "low specification" criteria instead of a brand, is required.

Methods:

The proposed methodology will be a quantitative research format, Station officers and Practitioners will complete an online survey to evaluate if thermometers currently used for hypothermic patient's lower limits are standard and appropriate for use.

Results:

It is presumed that the results will show a variety of different make and models with different low reading ranges throughout services and stations, which are either, not appropriate for practitioner use or the low reading values are not fully understood by practitioners, whichever is true, a problem is confirmed to exist.

Discussions:

How can we limit three shocks for a severely hypothermic patient when we are either not sure how low our device limits are, or cannot accurately record below 30°C? Why we are content in writing the word "Low" an undetermined value, as a vital sign. The author asks the question "Is low acceptable".

Conclusions:

It is expected that devices used across the emergency services are not of standard specification and certainly some are incapable of recording the lower limits required to treat severely hypothermic patients, Esophageal or Rectal trending temperatures for severe hypothermic patients may be the appropriate method.

Research Question: *Is Safe-talk and Asist a good tool for the modern Paramedic*

Author: Christopher Watson

Abstract

Paramedics are often the first called to attend and assist a person who is experiencing a mental health crisis and or feeling suicidal. The area of mental health and suicide can be complex, profound and repetitive for some patients presenting to ambulance personnel.

The purpose of this research is to determine the confidence levels of paramedics within Dublin Fire Brigade in responding to the immediate needs of the person, experiencing mental health crisis with particular focus on suicide ideation.

A sample questionnaire of fourteen questions was circulated to 60 paramedics within Dublin Fire Brigade, to examine the confidence levels paramedics felt in responding to the person. The questionnaire invited opinions as to relevant training given to equip the paramedic with the necessary skills to respond appropriately, to ensure patient gets professional help.

The results of the questionnaire showed low confidence levels in paramedics dealing with person in mental health crisis experiencing suicidal thoughts. A significant portion of participants who completed the survey noted they would welcome further training in suicide awareness and responding to person expressing suicidal ideation.

The literature review undertaken will focus on examining further training that could enhance the delivery of the ambulance service and ensuring better outcomes for patient, with particular focus on Safe talk and ASIST training.