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Paramedics Australasia Conference: Oral Abstracts

Effect of early recognition and CPR instruction by emergency call takers on survival from out-of-hospital cardiac arrest.

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Background

Early recognition of the patient in cardiac arrest by emergency call takers and provision of instructions to perform CPR have been shown to improve outcome. This research assessed a new call taker protocol to identify patients in cardiac arrest.

Methods

Consecutive calls to one territory-wide ambulance call centre from 1 January 2014 to 31 January 2015 in which CPR instructions were provided. Electronic patient care records were reviewed to determine any cardiac arrests attended by paramedics in which CPR instructions were not provided.

Results

Of 38,583 emergency calls, 442 (1.1%) received CPR instruction; there were 176 patients in cardiac arrest on paramedics' arrival. Call takers correctly identified 100% of cardiac arrests; 48% took more than 60 seconds for CPR instructions to be initiated. Bystander CPR was performed on 87% of patients; 44% were in a shockable rhythm on paramedic arrival, and 18% survived to discharge (1 patient was lost to follow-up). A caller's best chance of survival occurred when CPR instructions were initiated 30-60 seconds from the start of the call; prognosis was worse outside this window (Survival to discharge: 16% vs 31% vs 11%).

Conclusion

A two-question protocol for emergency call takers accurately identified patients in cardiac arrest, with reasonable specificity. Rapid recognition of cardiac arrest is not associated with improved survival. Further research is needed to explore these findings.

Does the Attendance of an Intensive Care Paramedic at an Adult Cardiac Arrest in Queensland Improve Patient Outcomes?

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Background

To determine if the attendance of an Intensive Care Paramedic (ICP) at an adult cardiac arrest in Queensland is still associated with a survival benefit despite the diminishing gap in the skill sets between ICP's and Advanced Care Paramedics (ACP).

Methods

A retrospective analysis of routinely collected administrative data from Queensland Ambulance Service and Queensland Health was conducted. Descriptive analysis examined the relationships between key explanatory and outcome variables, and demographic and pre-hospital factors. Binary logistic regression was used to determine the probability of survival from OOHCA in those patients attended by ICPs versus those that were not.

Results

6160 patients were included in the final analysis. Compared with cases where an ICP did not attend, ICPs attended a greater proportion of cardiac arrests that were witnessed by a bystander, where CPR was being performed and where patients were in a shockable rhythm on arrival. ICP attendance was associated with higher rates of ROSC (33.6% vs. 18.7%, $p = <0.001$) and survival to hospital admission (27.5% vs. 18.6%, $p = <0.001$); no significant difference in survival to discharge rates was found. However, subgroup analysis of patients who did not receive adrenaline, found a positive association between ICP attendance and survival to hospital discharge (28.2% vs. 11.7%, $p = <0.001$).

Conclusion

The attendance of an ICP at an adult cardiogenic cardiac arrest in Queensland is associated with a higher rate of ROSC and survival to hospital admission despite the increasing similarity in the interventional skill sets of ICPs and ACPs.

Aetiology of out-of-hospital cardiac arrest in New Zealand

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Background

An analysis of data extracted from the St John New Zealand out-of-hospital cardiac arrest registry (SOHCAR) was undertaken to determine the aetiology of cardiac arrest. This information on probable causation provides an important baseline that can be used to target future preventative strategies for at risk populations.

Methods

Data was extracted from the St John OHCA registry for a one year period, 1 October 2013 to 30 September 2014. Records were included in the analysis if they met the following criteria: resuscitation was attempted and the gender, age and probable aetiology of the cardiac arrest were known. The extracted data was categorised according to age, gender and aetiology of arrest which was then analysed as a proportion of the total number of cardiac arrests attended.

Results

A total of 1897 records were included in the analysis, of these 1318 were male and 579 were female. The most common causes of cardiac arrest in patients under 20 years old for both genders was sudden unexpected death in infancy (SUDI) and respiratory. In patients of both genders that were 40 years and older the most predominate cause was that of presumed cardiac origin. For males in the 20 to 39 age group (n=102), the most common aetiology was presumed cardiac (39.2%), followed by trauma (17.6%). For females in this age group (n=42) the most common aetiology was presumed cardiac (40.5%), followed by hanging (31.7%).

Conclusions

Overall these results indicate differences in the aetiology of cardiac arrest in New Zealand dependent on gender and age and are worthy of further investigation.

Exploring New Zealand paramedic attitudes towards placebos versus adrenaline trials in pre-hospital cardiac arrest: An ethical inquiry.

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Summary

The use of placebos is ethically controversial; they usually involve a degree of deception and at least, a withholding of information. However, in some instances their use can be justified. In New Zealand and elsewhere, the use of adrenaline by paramedics in the treatment of cardiac arrest is standard and recommended practice. However a systematic review and meta-analysis of adrenaline in the treatment of out of hospital cardiac arrest has been inconclusive, providing the impetus for a number of research projects into adrenaline's efficacy. The implementation of clinical trials to assess such efficacy has been accompanied by a sense of unease for both the public and some participating health professionals. Better understanding the ethical complexity of placebo use in such clinical trials may help contribute to the planning, design and implementation of future research in this area. This qualitative, interpretative study explores the attitudes of seventeen New Zealand practising independent / intensive care paramedics towards a hypothetical clinical trial scenario involving the use of placebo or adrenaline in an out of hospital primary adult cardiac arrest. The Values Exchange, a web-based educational technology, provided an ethical decision-making framework for participants to consider the scenario. A thematic analysis of their responses suggest that the need to maintain public trust through openness and honesty is a key driver for paramedic decision-making during this type of clinical trial. Identified areas of ethical tension included balancing the benefits and risks for patients and balancing the needs of trial patients with those of future patients.

Does pre-hospital remote ischaemic conditioning enhance long-term outcome among acute ST-elevation myocardial infarction (STEMI) patients? A systematic review.

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Introduction

Percutaneous Coronary Intervention (PCI) is considered the gold-standard in myocardial infarction revascularisation. However, evidence suggests acute ischaemia reperfusion injury (IRI) may occur following revascularisation. Consequently, the focus of revascularisation is shifting, with measures sought to limit IRI. Remote ischaemic conditioning (RIC) offers a potential solution, whereby sub-lethal transitory episodes of ischaemia are created in tissues distal to the heart. This is achieved with a BP cuff stimulus, which has been shown to improve outcomes post-revascularisation. This review examines whether RIC is a worthwhile adjunct to employ in pre-hospital treatment of STEMI.

Methods

An updated systematic literature review was completed, with research retrieved from Cochrane Library, CINAHL, EBSCO, Medline and PubMed. Inclusion/exclusion criteria were employed to ensure relevant data was obtained: written in English; recently, where studies performed over 10 years ago were discounted; original articles published in peer-reviewed journals.

Results

427 articles were retrieved, with 9 included in this review. Overall, the studies indicated that RIC results in greater myocardial salvage, left ventricular salvage, endothelial function, ST segment resolution and reduction in STEMI size, myocardial oedema, and major adverse cardiac and cerebrovascular events.

Conclusion

Research in this area remains limited, particularly within the pre-hospital context. However, this review is hugely suggestive that RIC prior to PCI can facilitate enhanced patient outcomes among selected STEMI patients. Initiating such treatment offers exciting potential for pre-hospital care, especially given the ability for ambulance personnel at any practice level to administer this treatment. However, further research is warranted to provide evidence-based recommendations for future pre-hospital STEMI care.

Paediatric rapid sequence intubation by Helicopter Emergency Medical Service paramedics – An 11 year observational study

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Introduction

This study aimed to describe the characteristics of children receiving prehospital rapid sequence intubation (RSI), and the procedural success of paramedics performing RSI.

Methods

The study was undertaken in the paramedic-staffed Helicopter Emergency Medical Service of Ambulance Victoria, Australia. Ambulance Victoria Patient Care Records (paper and electronic) were searched for the period 2002 to 2013. Inclusion criteria were: patient age <17 years; intubation; administration of suxamethonium and patient transported to the Royal Children's Hospital (Melbourne).

Results

There were 210 patients available for analysis. The majority of patients were male (68.7%), between 9-16 years of age (54.3%) and suffering a traumatic injury (76.3%). The overall intubation success rate was 99.1%, with a first-pass success of 91.0%. One patient was managed via supraglottic airway, one patient via oropharyngeal airway, and one underwent cricothyroidotomy (who was ultimately intubated). Patients most commonly presented with a GCS of 3-8 (59.5%), followed by 9-12 (31%) and 13-15 (9.5%). There was no clinically relevant difference in median oxygen saturation, heart rate or blood pressure pre and post intubation (SpO₂ 100% vs 100%; heart rate 114bpm vs 128bpm; BP 117mmHg vs 120mmHg).

Conclusion

Exposure to paediatric RSI was <1 procedure per paramedic, per year. Paramedics who have high exposure to adult RSI and undergo rigorous training and reaccreditation in paediatric RSI have high procedural success rates. Hypotension, hypoxia and the use of airway adjuncts other than an endotracheal tube are uncommon. Further study is required to investigate whether procedural success in the prehospital environment translates to improved patient outcomes.

Prehospital lactate measurement as a tool for initiating sepsis treatment: A review

Harry Misselbrook

Background

Severe sepsis and septic shock have historically been poorly recognised and managed in the prehospital field. Septic shock may present without overt abnormalities in blood pressure and heart rate, despite moderate to severe multiple organ dysfunction, a phenomenon known as cryptic shock. Lactate measurements above 4mmol/L have been shown to be highly predictive of organ dysfunction and are indicative of shock. This review will investigate the use of prehospital lactate measurement as the clinical tool for initiating treatment for severe sepsis and septic shock, and comment on the utility of introducing lactate measurement into prehospital clinical guidelines.

Method

Electronic databases Cochrane, Medline, CINAHL, Scopus, OVID and EBSCO were searched, with key terms “lactate” OR “sepsis” AND “pre-hospital” OR “emergency medical services”. Limits included: language (English), full text journal articles and date of publication (2005 to 2015).

Results

Five studies met inclusion criteria. Findings: lactate concentration was positively correlated with mortality and increased severity of multiple organ dysfunction. Prehospital lactate measurement was feasible. The sole randomised controlled trial (RCT) reviewed used lactate measurement to initiate intravenous fluid resuscitation; normotensive sepsis patients with elevated lactate had a 50% reduction in mortality, although such cryptic shock patients did not meet the usual criteria for fluid resuscitation.

Conclusions

The implementation of prehospital lactate measurement is feasible, with potential clinical relevance. Early identification and management of sepsis is associated with a reduction in mortality. However, sufficiently powered RCTs are required to recommend the routine use of lactate measurement in the prehospital setting.

Paramedic neurological assessment for patients with acute cervical spinal cord injury

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Summary

Acute therapies for patients with spinal cord injury (SCI), such as hypothermia, and spinal decompression may improve outcome if given very early after injury. However, clinical trials evaluating very early therapies after SCI are difficult because of the absence of a rapid field assessment to determine the severity and level of SCI. The aims of this study were (1) to develop a brief paramedic neurological assessment to determine severity and level of SCI and (2) to retrospectively validate this assessment. Based on the current established hospital examinations for SCI patients, the SPinal Emergency Evaluation of Deficits (SPEED) rapid assessment tool was developed. Patients between the age of 15 and 70 who sustained a confirmed C3-T1 traumatic SCI in Victoria between 2010-2013 were included. Data were extracted from ambulance and hospital medical records and the SPEED score derived by two assessors blinded to the injury severity. A total of 49 cases were included. There was strong agreement between assessors regarding SPEED scores. There was a 90% agreement ($\kappa = 0.9$) and a good correlation ($r^2 = 0.75$) between the SPEED score and the severity of SCI on acute hospital assessment. All cases with weak or absent handgrip in the field had confirmed cervical SCI, whereas all cases with normal handgrip did not have cervical SCI. In conclusion, the SPEED assessment appears capable of determining both the severity and level of cervical SCI. This assessment could be used by paramedics to identify patients with SCI more likely to benefit from early therapy.

The epidemiology of pre hospital care on Western Australian beaches

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Background

Surf Life Saving Western Australia (SLSWA) is the state's premier coastal surveillance and rescue service. Over financial years 2009-2014 Western Australian surf life savers and lifeguards treated more than 30781 people for injuries and illnesses. The objectives of this study were to:

- investigate the types of injuries and illnesses presenting to SLSWA on Western Australian beaches; and
- guide operational training and practice based on these findings

Methods

Non-identifiable data generated from SLSA Incident Report Forms and Incident Report Database was extracted. PASG version 17 was applied for analysis of the quantitative data.

Results

Over the five financial years 2009-2014 there were 30781 reported incidents on Western Australian beaches. Of the 30781 incidents recorded, 21% was traumatic in nature, 70% were marine stings, and 6% cardiac problems. 1298 persons were transported to hospital by ambulance. The majority of ambulance transports was for suspected spinal injuries (20%), marine stings (39%), dislocations or suspected fractures (20%). A statistically significant increase in major marine stings ($p < 0.05$) comparative to other injury/illness types was identified over the five year period.

Conclusions

The current training platform for lifesaver and lifeguard personnel is based on a traditional cyclical model. An evidence based approach to examining organisational burden of care has led to the development of a training package supporting operational need. The cause of increase in major marine sting presentation is unknown, further research to investigate this phenomenon is recommended.

Endotracheal intubation associated with pre-hospital use of ketamine in the Australian Capital Territory – A 12 month retrospective analysis.

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Background

Ketamine is now widely used as a first line agent in the pre-hospital environment for analgesia, sedation and to facilitate endotracheal intubation. There remains very little literature as to the rates of endotracheal intubation and other outcomes of patients receiving ketamine.

Methods

Analysis of consecutive presentations to a tertiary ED after pre-hospital administration of ketamine from 1 January 2013 to 31 December 2013. Patients were identified using pre-hospital records and then linked to ED records and data extracted from electronic and hard copy records.

Results

There were 140 patients identified who received ketamine pre-hospital. Participants received on average 131.9mg of ketamine (SD 117.8) with 67% receiving it for analgesia and 27% for sedation; 24 (17.1%) were intubated. Nine (6.4%) were intubated in the pre-hospital environment and 15 (10.7%) in the ED. Of the ED intubations, 8 patients had received prehospital ketamine for pain and 7 for sedation. Patients intubated in ED received more pre-hospital ketamine (211mg vs 118.8mg). Patients who received ketamine for combativeness were more likely to be intubated pre-hospital (3/38 vs 0/94) or in ED (7/38 vs 8/94).

Conclusions

Intubation rates following ketamine use in this study appear to be lower than reported elsewhere. Optimal dosing as well as indications for intubation and their association with intubation are areas of future research. This study confirms that ketamine remains a safe choice pre-hospital with low rates of endotracheal intubation with rare adverse effects.

Enhancing future research capacity in paramedicine: the Undergraduate Paramedic Student Research Engagement AcadeMy.

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Summary

Developing future research capacity is a priority area in paramedicine. The Undergraduate Paramedic Student Research Engagement AcadeMy (UPSTREAM) is an undergraduate research capacity building initiative. It aims to engage student paramedics in research by providing a vehicle for active participation in a supervised research project from inception to publication. UPSTREAM allows students to actively learn the anatomy of research projects investigation of an aspect of paramedic practice in a collaborative, peer-based team environment, supervised by an experienced academic. Projects are derived from questions posed by students in previous practical units, and investigate areas such as effectiveness of CPR under various conditions, and accuracy and agreement in vital sign measurement. Results of these projects are fed back to the broader student cohort through teaching and learning content, completing a cycle that transitions research into learning. UPSTREAM is therefore research conducted by students, about students, for students, and for future paramedic practice.

In 2014-15, 18 second-year paramedicine students volunteered to participate in the inaugural UPSTREAM program. Participants were divided into four research teams and allocated a prospective research project and a research facilitator. The student researchers participated in focussed education sessions as the sequential phases of the respective studies unfolded, developing and conducting the studies from inception to completion.

All four projects are nearing completion and it is anticipated that participants will emerge from the program with a higher level of research engagement, greater understanding of the research process, and sustained interest in research when they transition into post-graduate professional practice.

The effect of faculty assessor presence versus absence on paramedicine students' performance in clinical competency assessments

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Background

Previous research suggests removing assessors from simulation-based clinical assessments is highly popular with students, decreasing their anxiety, allowing them to better focus on clinical decision-making, and thereby more accurately reflect their levels of clinical competence. However, the extent to which anxiety associated with the presence of assessors actually impacts on students' performance remains equivocal; we sought to clarify this question.

Methods

N=31 paramedicine students completed two simulation-based clinical assessments, one in the presence of an assessor and one without, in random order. Students' distraction was quantified via head-mounted cameras, anxiety via continuous heart-rate (HR), and performance via time-to-completion plus expert assessments using a structured clinical assessment checklist. A sub-sample (n=12) participated in qualitative, one-on-one, in-depth interviews afterwards.

Results

Students completed simulated scenarios nearly two minutes quicker when the assessor was 'absent' compared to 'present' (6.6 vs. 8.4 min, $p<.001$). Much of the additional time was spent conversing with assessors (61.4 sec, $SD=33.4$). Students' HR was significantly elevated over baseline in the assessor 'present' compared to 'absent' condition (+4.3bpm, $p=.040$) and interview data confirmed they were more stressed in the presence of assessors. However, no statistical difference was evident between students' performance scores in the assessor 'absent' versus 'present' condition (71.6% vs. 69.4% respectively, $p=.496$).

Conclusion

Students were less distracted and stressed in the absence of assessors but performed just as well and more quickly; enhancing their self-confidence. Alternative methods of assessment, such as via two-way mirrors or video-recordings, are recommended during clinical assessments to enhance students' learning outcomes.

Paramedic students experience, knowledge, and attitudes toward older adults.

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Background

Improving attitudes is the cornerstone to improving care, as attitudes influence how information is interpreted, how knowledge is acquired, and ultimately leads to changes in behaviour and practice. Given our aging population it is vital that student paramedics are adequately prepared with experiences and knowledge that will lead to the formation of positive attitudes towards these patients. Armed with a better understanding of the level of student knowledge, attitudes, and experience, educators can tailor programs to fill the gaps, rectify inaccurate assumptions and provide the foundations for the provision of quality care to older adults. The aim of this study was to determine student paramedic experience, knowledge, and attitudes toward older adults.

Methods

A cross-sectional study utilising paper based surveys was conducted with paramedic students across four universities in Victoria, Australia.

Results

A total of 871 participants completed three surveys on their experience, knowledge and attitudes towards older adults. The overall median for self-rated level of experience interacting with older adults, on a scale of 1 (Low) to 10 (High), was 6 (IQR 5, 8). The overall mean (SD) score for the Australian Facts on Aging Quiz was 13.0 (3.0) out of 25. The overall mean (SD) score for the Aging Semantic Differential was 120.27 (17.77) indicating only slightly positive attitudes.

Conclusion

Paramedic students require broader experience with, and education about older adults to ensure the formation of positive attitudes based on balanced and factual information. This will lead to paramedics being better equipped to meet the need of this growing population.

The effectiveness of video glasses for providing feedback in undergraduate paramedic education

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Background

Research has continually highlighted the importance of effective feedback to enhance the learners' ability to reflect and further progress. The objective of this study was to identify the student perceptions of the effectiveness of video glasses in providing feedback following a practical session.

Methods

This was a cross-sectional study utilising a paper-base survey. Paramedic students enrolled in first and third year at Monash University were invited to participate in the study. Students wore video glasses during a practical session instead of normal safety glasses. The students downloaded the video from the glasses and reviewed their performance. Following a review of their video, students were asked to complete a questionnaire on the value and utilisation of the video glasses.

Results

The results concluded that the utilisation of video glasses assisted students (n=67) to identify weakness in their performance with a respective 73.9% (mean 3.01, SD .977) either agreeing or strongly agreeing. A further 66.7% (mean 2.91, SD .996) agreeing or strongly agreeing that the recording assisted them in identifying strengths in their performance. When reflecting on communication skills 58.8% (mean 2.91, SD .757) agreed that the vision helped them and an astounding 68.1% (mean 2.82, SD .920) with agreed or strongly agreed that this footage helped them identify issues/event that otherwise would have been overlooked.

Conclusion

The utilisation of video glasses has demonstrated positive results in providing effective feedback to paramedic students with further research still required.

Clinical placement before or after simulated learning environments? A naturalistic study of clinical skills acquisition amongst early-stage paramedicine students

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Background

There is conflicting evidence surrounding the merit of clinical placements (CP) for early-stage health-profession students. Some contend early-stage CPs facilitate contextualisation of subsequently learned theory. Others argue training in simulated-learning experiences (SLEs) should occur before CP to ensure students possess at least basic competency. We sought to investigate both claims.

Methods

First-year paramedicine students (n=85) undertook three days of CP and SLEs as part of course requirements. Students undertook CP either before or after participation in SLEs creating two groups (Clin→Sim/Sim→Clin). Clinical skills acquisition was measured via direct scenario-based clinical assessments with expert observers conducted at four intervals over the semester. Perceptions of difficulty of CP and the SLE were measured via the NASA-TLX.

Results

Students' clinical assessment scores in both groups improved significantly from beginning to end of semester ($p < .001$). However, at semester's end clinical assessment scores for the Sim→Clin group were statistically significantly greater than those of the Clin→Sim group ($p = .021$). Both groups found SLEs more demanding than CP ($p < .001$). However, compared to the Sim→Clin group, the Clin→Sim group rated SLE as substantially more time-demanding than CP ($p = .003$).

Conclusion

Differences in temporal demand suggest Clin→Sim students had fewer opportunities to practice clinical skills during CP than Sim→Clin students due to a more limited scope of practice. Sim→Clin students contextualised SLE within subsequent CP resulting in greater improvement in clinical competency by semester's end in comparison to Clin→Sim students that were forced to contextualise skills retrospectively.

Analysis of the development and implementation of mental health-related clinical practice guidelines in Australian ambulance services: The relationship between guidelines / protocols & mental health legislation

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Summary

Guidelines provide paramedics with clinical and operational structures to assist them in the provision of care and are influenced by changing expectations in service delivery and clinical decision making and treatment. The objective of this study is to examine mental health related guidelines and policy documents to investigate their effectiveness, their translation into practice, and the evidence which supports them. The study focussed on three main areas: mental health legislation and its role in defining paramedic practice, the relationship between legislation and clinical practice guidelines and protocols and the connections to overarching mental health reform. The clinical practice guidelines were analysed based on their design, their detail regarding assessment and management including physical and chemical restraint, and reference to legislation and other guidelines. The results identified that the design of the guidelines varied across Australian ambulance jurisdictions but were predominately aligned with legislation as their foundation. Across jurisdictions guidelines had varying detail regarding the use and implementation of the mental state examination. Involuntary transport and the use of physical and chemical restraint by necessity were clearly outlined in policy and guidelines / protocols but there was less focus on de-escalation and broader mental health reform frameworks. The development of guidelines and their implementation provide opportunities to establish both frontline and cross discipline collaboration to ensure that current and ongoing evidence can be translated to improved patient care particularly in the area of mental health care.

Burnout in Australian Paramedics

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Background

Burnout is a significant issue in paramedicine, with an emerging body of evidence suggesting paramedics have the highest incidence of burnout of any researched health profession. Burnout has been linked to decreased job satisfaction, increased absenteeism, low morale, decreased job retention, poor patient care and decreased emotional and physical wellbeing. However, there is a strong case for contemporary research investigating burnout in Australian paramedicine as much of the existing evidence lacks currency or has occurred internationally.

Methods

The objective of this study was to examine the prevalence of self-reported burnout in a national convenience sample of Australian paramedics using the Copenhagen Burnout Inventory (CBI), a validated survey instrument used previously to assess burnout in South African paramedics as well other healthcare professionals.

Results

Paramedics were recruited through the professional organisations and social media. Results of the 962 paramedics who responded will be presented in relation to demographic questions including gender (54% male), years of service (<5–20+ years), education and marital status. The results of the dedicated CBI questions will be presented in terms of total burnout and three distinct domains of burnout: personal, work-related and client-related.

Conclusion

The study will provide important baseline data that will be useful for informing strategies to reduce burnout across the paramedic profession. It is important that paramedics are provided with the supports necessary for them to achieve longevity in their careers, but it is equally important that those programs are based on evidence enabling funds to be directed to the most effective intervention.

The development of the SA Ambulance Service Cardiac Arrest Registry (SAAS-CAR)

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Background

The establishment of a quality cardiac arrest registry for ambulance services is vital to determine strategies that may increase the likelihood of survival. This study aims to describe the development of the SAAS-CAR in South Australia.

Methods

The researchers examined the background, aims, objectives and current status of establishing the SAAS-CAR and the processes in place to ensure its ongoing effectiveness and research output.

Results

SA Ambulance Service (SAAS) is the principal provider of emergency and non-urgent ambulance services across South Australia. The SAAS-CAR was developed in 2009 to monitor OHCA events as an ongoing quality control initiative, to facilitate key performance indicator reports and to benchmark against other Australian states and New Zealand. The SAAS-CAR is governed within SAAS's Clinical Performance and Patient Safety framework. There is no external funding.

A comprehensive list of SAAS-CAR variables has been established based upon internationally agreed key data elements. Data is collected retrospectively from paper-based patient care records, entered into an Excel spreadsheet and later transferred into a secure server database. Outcomes include survival of event and hospital discharge status. Human Research Ethics Committee approval has been obtained (HREC/14/SAH/120) for the inclusion of SAAS-CAR data in the Australian Resuscitation Outcomes Consortium (Aus-ROC) Epistry.

Conclusions

The SAAS-CAR provides a comprehensive measure of resuscitation performance throughout SAAS. However further strategies including funding and robust data management are required to ensure the SAAS-CAR's quality and sustainability. The SAAS-CAR is being utilised in collaborative research initiatives.

Workplace acceptance and experiences of LGBTIQ health professionals: A systematic literature review

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Background

The purpose of this study was to explore the workplace acceptance and experiences of lesbian, gay, bisexual, transgender, intersex and queer (LGBTIQ) paramedics.

Methods

A systematic search of academic databases and reference lists from selected papers were the sources of the data. Inclusion criteria were research papers published in English, which focused on workplace acceptance and experiences of LGBTIQ health personnel.

Results

The initial focus of this systematic review was the workplace acceptance and experiences of LGBTIQ paramedics. However due to no published research specific to the paramedic profession the scope of the review was broadened to include of all LGBTIQ health personnel. Thirty-three papers were included in this review. Evidence indicated that LGBTIQ health professionals experienced discrimination from their patients, heterosexual colleagues and 'closeted' LGBTIQ peers. Positive contribution of LGBTIQ health professionals include improved patient care and role models for LGBTIQ peers. Inclusive policy is required for LGBTIQ health professional workforce retention.

Conclusions

The paramedic workforce is known to be a high risk occupational group for post-traumatic stress disorder and depression. Theoretically, LGBTIQ paramedics working in a heteronormative culture experience increased level of stress. While LGBTIQ health professionals receive legislative protection against discrimination, discrimination still exists in practice through lack of visibility. Effective and efficient integration of LGBTIQ health professionals could improve workplace satisfaction, workforce retention, and equity of access by marginalised groups. An inclusive workplace policy of LGBTIQ embraces and celebrates the value of diversity.

Non-transportation and subsequent paramedic re-attendance rates for cases not conveyed to an Emergency Department by NSW Ambulance paramedics 2006-09: A linked data study.

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Background

This presentation describes non-transportation and re-attendance rates for cases where the patient was not initially transported to an Emergency Department (ED) by NSW Ambulance paramedics.

Methods

The records of 2,041,728 NSW Ambulance emergency or urgent care episodes for 1,116,509 patients whose records had been linked to hospital and death records (2006-09) were reviewed. Cases where patients were, and were not, transported to an ED at the time of the initial paramedic visit were analysed. Cases where patients were declared 'deceased on examination' by paramedics at the time of the initial visit were excluded.

Results

During the 2006-09 financial years, the non-transportation rate for cases eligible for inclusion was 16.5% (n=334,559). Within one day of the initial visit, 5.4% (n=17,986) of these non-conveyed cases required a subsequent paramedic re-attendance. Cumulatively, 6.6% required a second paramedic within 2 days, and 16.0% requested an additional visit within 28 days. Of all one day re-attendances, few (0.3%) were for the highest priority 1A cases, and, across the three year study period, only 54 of these most urgent cases required paramedic re-attendance within one day. 'Falls' cases accounted for 22.8% of re-attendances within one day of an initial paramedic visit.

Conclusions

NSW Ambulance paramedics do a great job in often difficult environments. While some patients would have chosen to stay at a scene for a number of reasons, most (94.6 %) initially non-transported cases did not request a second paramedic visit within one day of their initial paramedic attendance.

A new model of care offered to non-transported older fallers to reduce future fall risk, subsequent ambulance call-outs and ED presentations

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Background

Older fallers comprise 5% of emergency responses and 25% of fallers are not transported to emergency departments (ED) after paramedic assessment. This population is at high risk for future falls and ambulance re-attendance. A randomised controlled trial investigated the effect of a multidisciplinary, tailored fall prevention program for non-transported fallers.

Methods

Attending paramedics referred non-transported fallers aged 65+ for further fall risk assessment. Intervention group participants (n=111) were linked with existing, relevant healthcare services. The control group (n=110) received individually-tailored written fall prevention advice. Intention to adhere to interventions was assessed with the Attitudes to Fall-Related Interventions Scale (AFRIS) at baseline. Intervention uptake was assessed after 6 months. Falls and health service use were monitored for 12 months.

Results

Intention-to-treat analysis showed no significant between-group difference in falls and health service use. Baseline AFRIS scores were predictive of adherence; 46% of intervention group participants did not complete the recommendations. Analysis based on intervention implementation revealed a significant difference in fall rates (IRR: 0.42, 95% CI 0.24-0.72, p= 0.002), ambulance re-attendance (IRR: 0.52, 95% CI 0.28-0.94, p= 0.032) and ED presentations (IRR: 0.36, 95% CI 0.18-0.73, p= 0.004) for individuals who adhered to recommendations compared with those who did not implement interventions.

Conclusion

This multidisciplinary fall prevention program did not prevent falls or reduce health service use overall. However, uptake of tailored recommendations resulted in significant benefits. This suggests that linking non-transported fallers to existing health services can significantly reduce falls, ambulance re-attendance and ED presentations in older adults who are willing to implement fall prevention recommendations.

Variation in the predictive accuracy of prioritising ambulance calls.

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Background

The aim of this study was to measure variation between chief complaints of the Medical Priority Dispatch System (MPDS) in the ability of high-priority dispatch to predict which patients are subsequently classified as high acuity (high severity) by paramedics.

Methods

Using data from St John Ambulance Western Australia, we grouped calls into the 32 MPDS chief complaints (e.g. chest pain, falls, stroke) and noted the priority level of dispatch as Priority 1 (highest), Priority 2 or Priority 3. We defined high-acuity patients as those assessed by paramedics as either Level 1 (resuscitation) or Level 2 (emergency) based on the Australasian Triage Scale, or patients who had died at the scene. For each chief complaint, we calculated the sensitivity, specificity, positive predictive value and negative predictive value of the association between Priority 1 dispatch and high patient acuity.

Results

Overall, 79% of high acuity patients were dispatched as Priority 1 (sensitivity). Conversely, 39% of patients dispatched as Priority 1 were later classified as high acuity (positive predictive value). There were large differences between chief complaints. For example, whereas chest pain had 99% sensitivity and 56% positive predictive value, incidents classified as “Sick Person” had only 6% sensitivity and 35% positive predictive value.

Conclusions

This study highlights aspects of the Medical Priority Dispatch System that could be targeted for potential improvements in prioritising ambulance calls.

Ambulance calls which do not require transport: Safety, effectiveness, and patient population in an urban setting

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Background

Many ambulance services have introduced paramedic-level protocols to identify patients in whom transport is not required (TNR). There is little follow up data available on the outcomes of such patients. The objective was to describe presentations to hospital within 48 hours of a TNR decision by paramedics.

Methods

Cohort study of all TNR cases in an Australian capital city and the associated ED over a two year period. TNR cases were matched with corresponding ED records using name and date of birth. Hospital presentation and outcome were manually audited.

Results

There were 8295 TNR events; 6190 unique patients were identified, 5683 (92%) had only 1 TNR in the period and 507 patients had more than one (range 2-51). Of those with one only TNR, 337 (5.9%) presented in the next 48 hours, 13 of them twice (125 resulted in admission, 40 of them to the short stay unit). Of the 336 patients with exactly 2 TNR, 57 (17.0%) made 63 ED visits in the next 48 hours; 25 (39.7%) resulted in admission, 7 of them to the short stay unit. The remaining 171 patients had 857 TNRs matched to multiple ED visits within 48 hours before and after.

Conclusions

TNR protocols appear safe and effective. Patients with more than one TNR event in 2 years represent a significantly different population with much higher ED usage.

Globalising student paramedic clinical education: Reflections and experiences of student paramedics undertaking international work-integrated learning.

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Background

An international educational experience offers students an opportunity to enhance their understanding of themselves and their chosen profession in a unique learning environment, and builds within them a sense of global citizenship. For student paramedics, work-integrated learning (WIL) in international settings allow students to develop attributes and knowledge in both clinical and non-clinical areas of their professional and personal life, respectively. In 2015, twelve undergraduate student paramedics completed three weeks of assessable WIL with ambulance services in South Africa or New Zealand. Students travelled independently without an accompanying UWS lecturer, and were supervised by preceptors provided by the ambulance services. The objective of this study is to evaluate student experiences and perceptions of an international emergency ambulance WIL placement.

Methods

The study involved conducting focus groups of eligible students, the data from which were recorded, transcribed and analysed using a thematic framework approach. An interpretivist epistemology underpinned the analysis of qualitative data and interpretation of results.

Results

Eight of the twelve students participated in the focus groups. The results will explore individual and collective perceptions of the students' experiences, including reflection on pastoral care issues, clinical supervision, resilience, and application of existing knowledge in a new environment. An evaluation of the perceived value of the placement strategy will be put forward, including both clinical and non-clinical benefits and disbenefits.

Conclusion

This study represents the first qualitative evaluation of an international WIL program. Its results will inform ongoing strategy in this priority area of undergraduate paramedicine education and training.

Learning to be professionals – Why paramedicine needs a signature pedagogy

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Background

To review published and grey literature to identify opportunities for tertiary education to evolve to meet the needs of the maturing paramedic profession in Australia.

Methods

A review of the literature was conducted to identify the current state of paramedic education in Australia and understand the barriers that exist to advancing the profession.

Results

The post-employment model of paramedic education has shifted to pre-employment bachelor degrees. Since the departure from vocational training, there is a perception of a widening theory-practice gap and critics who claim universities are not producing 'work-ready' graduates. A national accreditation scheme and professional competency standards exist for paramedic education, however, the current standards have failed to provide standardisation across the country. With national regulation will come a requirement for a standardised curriculum and a robust education accreditation system.

There has been a change in the scope and nature of practice for paramedics with enhancements in diagnostic procedures and clinical skills as well as development as primary health care providers and the use of low acuity pathways and referrals. Clinical placements, often considered an essential part of paramedic training have been dramatically reduced in number and duration and now their effectiveness to prepare students for the workplace is being questioned.

Conclusion

If tertiary paramedic education is to advance to meet the needs of the profession, it is essential to explore the concept of 'signature pedagogy' for paramedicine accompanied by the adoption of educational theory and philosophy based on the uniqueness of the paramedic discipline.

Impact of a pain management education intervention for prehospital care providers

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Background

Under-treatment of pain in the prehospital setting is a common occurrence. Routine clinical audit identified an inadequate level of analgesia administration to medical and trauma patients reporting pain on a Numeric Rating Scale (NRS; 0-10 scale). Anecdotal evidence from informal discussion with clinical staff revealed this was primarily due to an education gap existing. We sought to address this clinical deficiency through a proven method of a targeted educational intervention (EI).

Methods

Thirty-five clinical staff participated in an eight-hour pain management EI facilitated by two experienced Clinical Educators. Pre- and post-course surveys were provided to participants. Participation was anonymous and voluntary. The EI consisted of didactic lectures addressing the physiological response to pain, pharmacological and non-pharmacological analgesia options, documentation of analgesia and scenario-based simulated clinical cases requiring application of clinical knowledge to patient care.

Results

Post-EI, participants reported their understanding of the physiological process of pain as having improved. Participants also declared an improved knowledge of pharmacological and non-pharmacological pain relief options. Ability to calculate medication dosages was also reported as improved. Subsequent clinical audit displayed an improved level of appropriate analgesia administration to patients reporting pain as per NRS in the one-month period following the EI.

Conclusion

A targeted EI addressing deficiencies identified by a rigorous clinical audit process resulted in improved baseline knowledge, improved psychomotor skills, and subsequently improved clinical management of pain. These results suggest continuing education addressing pain management is of benefit.

Clinical education on a small scale - Designing and developing mobile applications to support clinical education

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Summary

Research indicates that mobile devices and applications provide many benefits for health care professionals. One of the most significant benefits identified was increased access to point-of-care tools, which has been shown to support better clinical decision-making and improved patient outcomes.

In the field of education recent research has also indicated that 81 percent of students use mobile devices to study, and of the different types of learning technologies available, students found that adaptive learning technologies with mobile devices were the most effective, with 85 percent indicating a moderate or major improvement in grades.

With new emerging trends in a younger generation of learners including “Bring Your Own Device” (BYOD) methodology and mobile device only internet connectivity, it creates an opportunity to produce learning material and clinical-decision making tools for small scale devices.

This presentation documents the design and development of mobile applications produced to support clinical education and clinical-decision making. It demonstrates that using new and diverse media and modes of communication may be an effective tool to reinforce key concepts to health care students, especially younger generations where mobile technology has become an integral part of their lives. It will demonstrate that this level of development now can be done “in-house” at institutions and at relative low expense.

Standards and quality indicators for best practice in paramedic and inter-professional experiential practica.

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Summary

Approximately 15,000 paramedics respond to over three million calls a year to treat critically ill and injured patients in Australia. Although these professionals are a vital component of the nation's health care, emergency preparedness, public safety and public health systems, paramedicine is still a young discipline within the university setting and does not yet have a national curriculum or national standards.

The long-term goal of the work was to guide the development of a standard national curriculum, which would contribute towards the development of international clinical standards. This presentation will describe the work of the project team.

The project has developed recommendations for 'standards' within paramedic experiential inter-professional clinical practice at the undergraduate level. The recommendations proposed, are an opportunity to structure and optimise action plans to facilitate best practice clinical practica for student learning in paramedic placements.

A final set of standards has been prepared for use in designing and implementing clinical learning in collaboration with partner agencies. These standards have been designed to support the delivery of safe and effective clinical learning opportunities for paramedic students. The standards could also be used to evaluate the appropriateness of selected clinical placements. A pilot implementation and subsequent evaluation of the validity and practicality of the standards is recommended.

Prehospital Care Education for Ambulance Nurses in Indonesia

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Background

Ambulances in Indonesia are staffed by emergency nurses as the paramedic profession is not yet recognised. Emergency nurses lack the prehospital care knowledge and skill to function fully in the prehospital setting. This presentation will describe the prehospital care curriculum development for an ambulance nurse course in Indonesia.

Methods

The project was undertaken by Monash and Brawijaya University plus Saiful Anwar Hospital in both Indonesia and Australia. The project's aim was to develop an ambulance nurse course for piloting in Malang, East Java. The project consisted of two main activities, a visit to Indonesia by Monash University staff and a visit to Australia by Brawijaya University and Saiful Anwar Hospital staff. The purpose visiting was to view educational facilities and processes and current prehospital care provision in both countries.

Results

Course content from the Master of Nursing course at Brawijaya University was compared to the paramedic course at Monash University. Deficits in knowledge and practical skills were identified and a course outline compiled. The main areas of difference between the courses were in the prehospital specific areas, e.g. trauma management. The curriculum was divided into two modules, basic and advanced. The basic course is designed for all ambulance nurses while the advanced course will be part of emergency nursing specialist program at Brawijaya University.

Conclusions

Enhancing the prehospital care knowledge and skill of emergency nurses in Indonesia is long overdue. The ambulance nurse course is designed to improve the emergency nurses' capacity to provide better prehospital care in Indonesia.

Development of an ambulance-specific geographic information system: Medical Emergency Geographic Analyser (MEGAN)

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¹ACT Ambulance Service, Canberra, Australia

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Background

Ambulance services are increasingly required to be evidence-based in decision making.

Methods

ACT Ambulance Service and ACT Emergency Services Agency have developed and implemented a powerful geographic information system (GIS) that provides authorised users with a range of desktop tools to support investigation, analysis, and planning. The system, known as the Medical Emergency Geographic Analyser (MEGAN), was developed and implemented in-house for under \$10,000.

Results

MEGAN offers users 19 different reports ranging from single incidents to aggregations of up to five years of data. Users can choose to have the data mapped on a Google Map, or download a spreadsheet for further analysis. MEGAN can identify cases meeting specified criteria including long response times and long mobilisation times. MEGAN can generate charts showing incidents in a defined area over specified periods of time. For strategic analysis and planning, MEGAN can calculate the workload for given areas at different times of the day, as well as the change in workload from one year to the next. By combining this with vehicle location data, MEGAN can provide information on where ambulances were when they received taskings, making MEGAN a powerful tool for analysis of area coverage and planning for station locations.

Conclusion

The design and software used by MEGAN could be implemented by other organisations seeking an inexpensive but powerful tool for business intelligence.

The epidemiology of patients presenting to emergency medical services in respiratory distress: A retrospective cohort study.

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Summary

The study describes the epidemiology of patients who requested EMS attendance for shortness of breath, and determined factors associated with severity of respiratory distress and patient improvement. It was a retrospective cohort study, including all patients presenting to Ambulance Victoria between January 1, 2012 and February 28, 2014.

The study showed that 14.2% of all people presenting to AV during the study period received a dispatch determinant of respiratory distress, or presented to paramedics in respiratory distress. The majority of patients included for analysis were aged 60 and over (62.0%). Most patients improved following ambulance care (65.0%), and a third of the patients were recorded as experiencing no change in their symptoms (33.4%). A patient's likelihood of improving decreased by 1% with every year of age, with males 12% less likely to improve than females. Patients with a self-reported diagnosis of COPD were least likely to improve (AOR 0.82 95% CI 0.73-0.93). The strongest independent predictor of improvement was the allocation of a dispatch determinant for a non-respiratory complaint (AOR 2.19 95% CI 1.96-2.45).

Respiratory distress is a common presentation to EMS. Elderly patients are overrepresented in both frequency of presentation and severity of symptoms. Age, gender, and medical history are associated with a patient's odds of improving. Further research is required into the characteristics influencing a patient's level of respiratory distress, and how to improve patient outcomes, particularly those patients presenting with COPD.

Motorcycle Paramedics – What’s in it for the patient and the ambulance service?

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Background

Although many ambulance services have motorcycle units, the benefits of such a service platform are unknown. In 2011, Ambulance Victoria (AV) embarked upon a 3 year trial of motorcycle paramedics to provide emergency care to the City of Melbourne. An independent external evaluation of the trial was conducted in 2014. This evaluation examined the value of the Motorcycle Paramedic Unit (PMU) with regards to operational performance and clinical effectiveness to determine whether the unit should be incorporated permanently into AV’s emergency response model.

METHODS

This was an operational and economic evaluation of the motorbike unit comparing the cost of the unit against set clinical and operational benchmarks so that an understanding of the value of this unit could be estimated. The research drew upon three key sources of data; a literature review, quantitative data from AV and Emergency Services Telecommunications Authority, and consultations with stakeholders.

RESULTS

It was identified that motorcycle paramedics contributed to response performance by reducing response times, improving the availability of stretcher ambulances, and providing benefits to patients by initiating treatment earlier. The PMU was able to overcome any access issues associated with traffic congestion or location, was suited to the inner city area and was comparatively inexpensive to maintain.

CONCLUSIONS

The research identified that there is opportunity to utilise motorcycle paramedics within ambulance services and provides information as to their operational performance, financial benefits and clinical effectiveness.

Preparedness of Australasian and UK Paramedic Academics to teach Evidence Based Practice - Initial Findings

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Background

Paramedics are required to be educated in and utilise Evidence Based Practice (EBP). However the academic skill set needed to achieve this in paramedic graduates is unclear. The qualifications, experiences and attitudes of the paramedic academics who teach into undergraduate degrees are also poorly documented. This research investigates the preparedness of Australasian and UK paramedic academics to teach EBP.

Methods

A constructivist based mixed methods approach synthesising data from literature review, case studies, focus groups and an online survey is used. The validated EBP survey is a census of all academics teaching into undergraduate paramedic degrees in Australasia and the UK.

Results

The academic skill set required to teach EBP to undergraduate paramedics derived from analysis of case study, focus groups and literature will be identified. The demographics of UK and Australasian academics, their qualifications, research experience, pedagogical content knowledge, awareness of paramedic industry and attitudes to EBP will be analysed in light of the skill set needed.

Conclusions

This work presents a novel, wide ranging analysis of the preparedness of Australasian and UK paramedic academics to teach EBP. It is also the first to present the demographics, qualifications, experience and attitudes to EBP of paramedic academic staff in Australasia or the UK. Information gained may be used to improve the EBP education of Paramedics worldwide.

Why don't paramedic students report exposure to workplace violence?

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Background

Previous research has shown paramedic students are exposed to various acts of workplace violence during ambulance clinical placements with these acts more likely discussed with peers but rarely officially reported. The objective of this study was to identify reasons for not reporting exposure to acts of workplace violence.

Methods

Paramedic students at Monash University who had been on ambulance clinical placements were eligible to participate. Third year students were invited to participate in an interview process whilst second year students were invited to participate in one of several focus groups. Students were asked two main questions, "reasons a student will not report a WPV incident" and "a process that students would be prepared to follow for reporting any WPV incident". Responses for the first question were compiled into themes whilst points for the second question were collated.

Results

Seven themes were identified from the focus group including "fear of backlash", "Don't want to upset chance of getting a job", "reporting will not change anything", "Don't want name tarnished", and "lack/not knowing reporting procedure". Main points for the reporting process included, "it needs to be anonymous", "done through the university", "confidential with follow up support", and "easy reporting process". The suggested reporting mechanisms included, "a phone app", "on line web page", "phone hotline", and "part of the clinical placement reflection".

Conclusion

Students need to be better educated on workplace violence acts and a multi-functional reporting system needs to be in place to entice students to report acts of workplace violence.

Consumer perspectives of a community paramedicine program in rural Ontario

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Background

To evaluate a community paramedicine program in rural Ontario, Canada through the perceptions and experiences of consumers.

Methods

An observational ethnographic approach was used to acquire qualitative data through informal discussions, semi-structured interviews and direct observation of interactions between consumers and community paramedics. The study was conducted in rural Ontario where a community paramedicine program has been established consisting of four components: Ad Hoc Home Visiting; Ageing at Home; Paramedic Wellness Clinics and Community Paramedic Response Unit. 14 adult consumers participated representing all program components. Main outcome measure was consumer satisfaction and perceived benefits.

Results

Three main interlinked themes were identified:

- 1). Improved health monitoring and primary health care access close to home.
- 2). Improved sense of security and support for vulnerable residents in the community.
- 3). Improved consumer education and empowerment for enhanced health management.

Conclusions

Consumers' reflections on their experiences and perceptions of a rural community paramedicine program indicate acceptance of paramedics in non-traditional preventative healthcare roles. This evidence supports the development of community paramedicine programs in rural Australia to improve health services and address workforce needs.

Debriefing the Debriefers

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Background

Debriefing is a crucial aspect of simulation based learning that is often overlooked within paramedic education. Debriefing fosters critical thinking and reflection, as well as consolidating theoretical concepts. This poster is intended to draw attention to some of the current thoughts surrounding high fidelity simulation and debriefing in particular.

Methods

A series of conversations were conducted with paramedic lecturers, students and tutors. The conversations were recorded and then transcribed. Key themes and ideas were identified. A modified nominal group technique was then used to narrow down these themes into four important areas requiring improvement.

Results

The conversations revealed consensus in issues regarding current debriefing time allocation, student engagement and student facilitation. Dispute was noted in the value placed upon debriefing, whether complex scenarios required facilitator intervention and how debriefs should be structured. Emotional seriousness, active listening, clinical reasoning and student interest were identified as aspects which require further improvement within the debriefing process.

Conclusion

A greater emphasis on debriefing as a learning tool in high fidelity simulation is needed within prehospital education. A structured approach the simulation process, with a focus on student led debriefing should be introduced by simulation facilitators, in order to garner maximum educational benefit.

Impact of movement and transport on effectiveness of external chest compressions when performed by student paramedics – A pilot study.

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Background

Effective external chest compressions (ECC) are recognised as being critical for increasing chances of survival in out-of-hospital cardiac arrest. The aim of this study was 1) to determine the impact of movement and transport on effectiveness of ECC performed by student paramedics; 2) to provide results to inform a future larger study; and 3) to validate teaching methods in an undergraduate paramedicine program.

Methods

A prospective cohort design was utilised. Student paramedics performed ECC on a manikin for three minutes in three different locations – hard-surface floor, moving stretcher, and moving ambulance with recovery periods in between. The primary outcome was 'compression score' (CS) (%). Linear regression was used to compare the primary outcome across the three conditions.

Results

Twenty-seven student paramedics performed chest compressions in all three locations. The mean CS for floor, stretcher and ambulance were 72% (SD 33), 8% (SD 13) and 57% (SD 37), respectively. Location of ECC was a significant predictor of CS. After adjustment, ECC on a stretcher was associated with a decrease in CS of -22.87 (95% CI -37.53 to -8.2) and for CPR in ambulance -6.11 (-16.24 to 4.02) compared to the reference value of ECC on the floor.

Conclusion

Location of CPR significantly impacts on quality of ECC. Paramedics should consider these findings when deciding to move or transport patients prior to return of spontaneous circulation. Lower than expected CS on hard ground surfaces may indicate a need to review teaching of ECC in this cohort of students.

Scoping what Impacts the Health of Australian Ambulance Paramedics.

Sarah Finlay¹, Jaime Wallis¹

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Background

Anecdotally the health and wellbeing of ambulance paramedics is often deemed as threatened due to the working environment and possibly ill work preparedness. The objective of this study was to conduct a scoping review of the current literature that investigates the current health impacts of Australian paramedics.

Methods

A scoping review of Australian literature was undertaken. The following electronic databases were searched; Ovid Medline, Proquest, CINAHL and PubMed and Google Scholar. Government and media websites were also included. This search identified 1726 articles. After inclusion and exclusion criterions were applied a total of 6 peer reviewed articles and 3 unpublished papers were deemed appropriate for review.

Results

Findings show that there were several facets of health and wellbeing that are negatively impacted on for Australian paramedics. These areas include sleep, mental health status, eating habits, physical activity, fatigue, burnout and injury. Even with limited sources to draw on, a strong correlation was drawn that the nature of work and long hours has a negative impact on the health and wellbeing of Australian paramedics. No published work was located that aimed to improve the health of Australian paramedics.

Conclusion

There is significant vacuity in the literature that examines the health and wellbeing of Australian paramedics. Further research is required to better understand the health and wellbeing needs of Australian paramedics. This data could ultimately foster the development and evaluation of programs aimed at improving the health and wellbeing of paramedics.

Pre-employment physical capacity testing as a predictor for musculoskeletal injury in paramedics: a review of the literature

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Background

Workplace injuries place a significant physical, social and financial burden on organisations globally, with annual costs exceeding 60 billion dollars in Australia alone. Paramedics are subject to a seven-fold risk of injuries compared to the national average. This review aims to identify the nature of paramedic musculoskeletal injury in the workplace, and known factors in pre-employment physical capacity testing that may be predictive of subsequent injury.

Methods

A review of the literature using electronic databases including Cochrane Database of Systemic Reviews, Ovid MEDLINE, EMBASE, CINAHL, United States of America National Institute for Occupational Safety and Health, Ryerson International Labour Occupational Safety and Health Index, International Occupational Safety and Health Information Centre and United Kingdom Health and Safety Executive Library and Information Service. The following search terms were used: musculoskeletal, workplace, injury, industrial, accident, pre-employment physical capacity testing, paramedic, emergency service employee, firefighter, and police.

Results

A total of 765 articles were identified, of which 30 met the criteria to be included in this review. Articles were separated into the key categories of cost, industry, and contributors to injury, for analysis and discussion, and both local and international findings were reported.

Conclusion

No existing study was found that investigated the relationship between pre-employment physical capacity testing scores and the subsequent occurrence of musculoskeletal injuries in paramedics. The potential association between intrinsic and extrinsic factors that paramedics are subjected to, and the specific nature of musculoskeletal injury consequent of paramedic workplace accidents has also not been explored.

Experiences from Afghanistan: Traumatic lower extremity amputation in the combat zone

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Background

Improvised explosive devices (IEDs) are a frightening weapon used by terrorists in the both the Afghanistan combat zone and in the civilian environment. In this presentation, the experiences of a former Australian Army Advanced Medical Operator in relation to the treatment of traumatic lower extremity amputations in the combat zone are discussed.

Methods

In addition to Australian Army medical practices and procedures, a personal narrative approach is used to discuss the management of traumatic amputations in a combat zone.

Results

Patients with traumatic amputation from an IED rarely have one isolated injury. Shrapnel injuries, burns, barotrauma, fractures and internal haemorrhage are commonly present as well. In the military setting, there are two phases of care in the field. First, in the 'care under fire phase' tourniquets are applied if possible, or direct pressure and haemostatic agents are used as an alternative. Tension pneumothoraxes are decompressed and immediate evacuation is then arranged. Second, the tactical field care phase involves spinal precautions, further haemorrhage control, the application of wound dressings and tractions splints and the administration of pain relief and IV fluids. Last, all interventions must be secured correctly to facilitate a rapid aero-medical evacuation.

Conclusion

While the combat zone differs greatly to the civilian environment, many of the principals involved in the treatment of traumatic lower extremity amputation are similar. These involve haemorrhage control, treating life threatening injuries, and rapid extrication and transport to definitive care.

Poster Presentations

Defining Industrial Paramedicine – A systematic Review

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Background

To explore the published literature for a definition for industrial paramedicine.

Methods

A comprehensive systematic analysis was conducting using the EBSCOhost (health), MEDLINE, SCOPUS and CINAHL electronic databases.

Results

An initial search using the combined two-term sets identified 870 citations. After applying the inclusion and exclusion criteria to a title and abstract review 40 articles were identified that discuss the role of paramedics in the remote or offshore environment and 12 articles discuss the provision of emergency medical services in the mining or oil and gas sectors. There is no single definition or comprehensive role description for industrial paramedicine within the worldwide literature.

Conclusion

Based on the literature available, a definition is offered:

An industrial paramedic is an advanced clinical practitioner in paramedicine with an expanded scope of practice. The industrial paramedic provides emergency response, primary health care, chronic disease management, injury prevention, health promotion, medical referral, and repatriation coordination at remote mining sites, offshore installations, and other isolated industry settings. The industrial paramedic is resourceful, adaptable, and comfortable working independently. Industrial paramedics practice on site with limited resources, remotely located from tertiary care, and use telemedicine to consult with other health professionals as required. Industrial paramedics are experts at rapidly assessing, prioritising, and establishing control in their unpredictable workspace to reduce risks and create an environment conducive to quality patient care. The industrial paramedic preferably holds a specialised tertiary qualification and is committed to maintaining their clinical competency through continuing professional development.

Design & implementation of a peer support programme for prehospital care providers

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Summary

Previous international study findings have determined that prehospital care providers, including EMTs and Paramedics, are among the highest risk group for stress, trauma, and burnout. The stressors associated with prehospital work have the ability to accumulate over time, as well as occurring due to critical incidents. A peer support programme was designed based on international best-practice. Staff were invited to apply, and subsequently they went through a rigorous screening and application process. Those who were successful in this process completed a 1-day peer support training programme. Twenty-six peer supporters are now currently in place across the company, supported by two peer support coordinators. A peer support pathway was developed covering emergency and non-emergency incidents, which also allows for referral of staff to mental health professionals if required. To date the peer support workers have engaged with 12 cases of stress amongst employees. Six of these incidents (50%) were due to a critical incident occurring on duty. The remainder were due to family (n=2) other work related issues (n=3) or cumulative stress (n=1). Six (50%) of the individuals who sought assistance from the peer support programme were employed less than one year, and eight of the twelve (67%) were under the age of 30. Males (n=9; 75%) were more likely to access the peer support programme than females (n=3; 25%). Advanced life support providers (n=7; 58%) accessed the service more frequently than basic life support providers (n=5; 42%).

Out-of-hospital cardiac arrest in the United Arab Emirates: Results from the PAROS study

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Background

The Emergency Cardiovascular Care (ECC) chain of survival, requires five elements to be acted upon to improve a patient's chance of survival from cardiac arrest: Immediate recognition of cardiac arrest & activation of the emergency response system; early cardiopulmonary resuscitation (CPR) with an emphasis on high-quality chest compressions; early defibrillation (ideally through public access defibrillators); early advanced life support and integrated post-cardiac arrest care.

Methods

National Ambulance introduced services to the Northern Emirates in February 2014 providing for each of these links in the chain of survival to be implemented.

Results

Over a one year period National Ambulance clinical staff in Northern Emirates attended 384 cardiac arrest incidents. Of these, 30% (n=115) had bystander CPR performed. An overall ROSC rate of 3.1% in the prehospital setting was observed (n=12) with a further 2.1% (n=9) ROSC gained on admission to Emergency Department. Utilisation of BLS measures was good among National Ambulance personnel with AED, LUCAS-2 and iGel applied in 100%, 71% and 84% application rates respectively.

Conclusion

The relatively low prehospital ROSC rate is attributable to low bystander CPR performance and the low availability of public access defibrillators. The rate of interventions performed by National Ambulance staff demonstrated overall good compliance.

Preparing for the worst: National Ambulance and the 2014 Ebola Virus epidemic

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Background

Ebola virus disease (EVD) is caused by infection with a virus of the family Filoviridae, genus Ebolavirus. It is a type of viral haemorrhagic fever (VHF). The 2014 Ebola outbreak in West Africa is the largest the world has ever seen, and the first Ebola epidemic in history. As of April 15th 2015, there have been a total of 25,826 suspected, probable, and confirmed cases, with 10,704 deaths.

National Ambulance Response

National Ambulance implemented a variety of controls designed to protect patients and clinical staff from harm. This included the provision of a high-risk personal protective equipment (PPE) training programme, a trained observer programme, and increased PPE supply to clinical staff. National Ambulance staff also began screening in November 2014 of passengers arriving on West African and Moroccan flights in Abu Dhabi International Airport due to its status as a major hub to identify potentially infected persons.

Key point

Conformance with Centre for Disease Control recommendations regarding personal protective equipment, screening of potentially infected patients and management of suspected cases of EVD was a key component in response to the threat posed by the epidemic.

Conclusion

The current outbreak of EVD in West Africa has challenged many healthcare systems, including ambulance services, across the globe. Through a process of continuous updating, meeting international best practice recommendations and education delivery, National Ambulance staff are prepared to deal safely and effectively with patients presenting with any potential communicable diseases. Patient safety remains the paramount concern.

The Certificate of Clinical Practice: Improving education for the Emergency Medical Technician – Basic

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Background

A standard curriculum for EMT education includes patient assessment skills in addition to a variety of patient care and management skills. National Ambulance LLC provide EMT trained personnel for care and transportation of patients in various service areas. A variety of EMT curricula exist around the world, including the Irish Pre-Hospital Emergency Care Council EMT Standard and the US National Highway Safety Transportation Authority EMT Standard. National Ambulance LLC sought to design a custom upskilling curriculum for EMT education in the UAE that met international best practice, contained evidence-based treatment options and utilised principles of adult education

Methods

National Ambulance Clinical Education staff investigated several international EMT curricula. In conjunction with academic partner Charles Sturt University, New South Wales, Australia, a curriculum was drafted that incorporated components deemed relevant to EMT clinical practice within the UAE.

Programme

The programme consists of a mixed didactic and practicum curriculum, delivered in three components – recognition of prior learning, classroom component and on-road clinical mentorship. The programme uses proven adult education methodologies such as group-work, flipped classroom, immersive simulation, case studies and self-directed learning.

Conclusion

The Certificate of Clinical Practice (EMT Basic) is an innovative curriculum that develops the knowledge of the EMT-Basic level provider. Both the educational materials and subsequent clinical practice protocols are evidence-based. Further higher education options are available for students who successfully complete this programme, providing motivation and a solid foundation for continued development.

Paramedic student compliance with the Triage Sieve for a simulated major incident: Compliance with primary and secondary triage based on physiological findings.

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Background

This project was to observe the compliance of graduating Paramedic students with the Triage Sieve (also known as SMART Triage) as adopted by New South Wales Health in responding to a simulated shooting event at an urban theatre complex.

Methods

A graduating class of Paramedic students from an Australian university undertaking a course in trauma emergencies participated in a mass casualty exercise. This was a quantitative observational analysis of allocated triage categories at timed intervals during a simulated mass casualty event. Outcomes focused on the correlation between triage categories planned versus actual allocation by the student triage, treatment and transport teams.

Results

The students were moderately successful at applying the Triage Sieve with a similar amount of under and over triage when completing a triage exercise during their course of studies. Skill and knowledge degradation after four (4) months was not overtly apparent in the numbers of correctly triaged victims but were significant in the numbers of over triaged victims during an online patient test.

Conclusions

During a semester based course as structured at an Australian University, modular mass casualty triage education may not provide students with adequate amounts of instruction and integration to be more specific with physiological presentation for correct triage categorisation as determined by the Triage Sieve. The program may need to consider mass casualty triage and disaster medicine as a stand-alone course with greater practical integration (multiple exercises) to embed skill and knowledge prior to graduation.

Lights, Sirens, & Leadership: Does the Use of Lights & Sirens Influence the Odds of U.S. Paramedic Students Serving as Team Leader?

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Background

Previous research suggests that U.S. paramedic students serve as team leader (TL) less frequently during their field internship for severe acuity cases. As an alternate perspective to student reported patient acuity, we sought to determine if the use of lights and sirens (L&S) during initial scene response, or transport to the hospital, influences the odds of a paramedic student serving in the role of team leader.

Methods

This IRB approved retrospective analysis utilized records from Fisdap™, an online EMS student tracking system. We included de-identified records for students who 1) gave consent for the use of the records, 2) whose records had been audited by a program representative, and 3) who had reported serving in the role of TL during their field internship. Data were descriptively summarized and arranged in a contingency table from which odds ratios were calculated.

Results

We included 57,895 student records. Students reported serving in the role of TL on 84% of all calls (n=48,852). L&S were used on 78% of all scene responses (n=45,313), but only on 18% of transports (n=10,605). The odds of a paramedic student functioning as TL were higher when the scene response involved the use of L&S (OR=1.2, 95% CI=1.15-1.25), but decreased when transport from the scene to the hospital involved the use of L&S (OR=0.94, 95% CI=0.93-0.95).

Conclusion

Given a relationship between patient acuity and mode of transport, the results of this study appear to support previous findings that U.S. paramedic students are less frequently serving as TL on severe acuity cases.

Relationship Between the Profit Status of an Accredited Paramedic Education Program's Sponsoring Institution and Summative Cognitive Exam Results Among U.S. Paramedic Students

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Background

The purpose of this study was to examine the relationship between profit status of U.S. institutions sponsoring accredited paramedic education programs and the summative cognitive exam success of students enrolled in those programs.

Methods

This IRB approved retrospective analysis utilized de-identified data from the Paramedic Readiness Exam (PRE3) and the BLUE exam administered by Fisdap™. The sponsoring institution of all 375 accredited paramedic education programs in the U.S. (as of 2/10/2014) were categorized into 1 of 3 profit status categories (Public: Not-for-Profit, Private: For-Profit, & Private: Not-for-Profit) by 3 independent raters ($R_{icc}=0.93$). One-Way ANOVA was used to compare overall test scores and institution profit status. All exam attempts were then dichotomized (pass/fail) and compared against institution profit status using Chi-square analysis.

Results

A total of 12,764 test attempts (PRE3=4,440; BLUE=8,324) were found to correspond with de-identified student records from 74 of the previously categorized institutions. Students performed similarly on the PRE3 ($\bar{x}=69.47$, $s=8.26$) and the BLUE ($\bar{x}=68.34$, $s=8.26$) exams. There was a significant difference in the combined overall scores associated with sponsoring institution profit status ($F=56.43$, $p<0.01$), with significantly lower scores among students attending Private: For-Profit institutions ($\bar{x}=60.74$, $s=6.64$), and compared to those from Public: Not-for-Profit ($\bar{x}=68.8$, $s=8.32$) and Private: Not-for-Profit institutions ($\bar{x}=69.01$, $s=7.14$). Private: For-Profit institutions had a significant lower pass rate (4.46%) compared to those attending Public: Not-for-Profit (33.69%) and Private: Not-for-Profit institutions (30.21%; $X^2=46.56$, $p<0.01$).

Conclusion

These results should prompt further investigation into why students appear to be performing differently according to the profit status of their sponsoring institution.

Evaluating the effectiveness of anaphylaxis treatment by Australian Lifeguard Services: Surf Life Saving Western Australia (SLSWA)

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Background

Australian Lifeguard Services provides pre hospital care to coastal areas in high population regions of Western Australia. Auto injectors for the treatment of anaphylaxis are recognised as safe, effective tools for community health workers and the public. To evaluate the effectiveness of anaphylaxis treatment by Australian Lifeguard Services utilising adrenaline auto injectors.

Methods

An information letter was sent to Australian Lifeguard Services personnel via surf club correspondence, informing staff of the need to use adrenaline auto injectors as per the Australasian Society of Clinical Immunology and Allergy (ASCIA) guidelines for management of allergy and anaphylaxis. The incident rate of allergy and anaphylaxis on Western Australian beaches is unknown and was measured as part of this project. A questionnaire was sent to responding staff that used adrenaline auto injectors for follow up of usage.

Results

Seventy SLSWA lifeguards underwent training by ASCIA in the application and use of adrenaline auto injectors. Posters and online component remained accessible to members for updating their training and self knowledge. Adrenaline auto-injectors were distributed to 10 beach patrols within the metropolitan Perth and South Western WA. There was one incident of anaphylaxis treated with the adrenaline auto injector at a remote beach in South West Western Australia.

Conclusion

Adrenaline auto injectors were easily and safely implemented into ALS first aid kits however more evaluation is needed to determine the cost efficiency for the wider SLS community.

Comparative Analysis of Paramedics in the Application of a Triage Sieve: A Paperbased Exercise

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Summary

The goal of this study was to investigate theoretical knowledge acquisition, and the practical application of a triage aide-memoir, on Mass Casualty Incident triage accuracy, through a paper based exercise (questionnaire), using Paramedics from a State based Ambulance Service. Utilising a previously trialled questionnaire subjects were asked to triage sieve 20 casualties. 292 participants were enrolled in the study using the following inclusion criteria “Operational clinical staff who are either in training to become a Paramedic, or have the clinical authority to practice at a Paramedic level or higher, who respond as part of an emergency ambulance crew or a solo responder within SA Ambulance Service, who would undertake a triage sieve”. Participants were randomly allocated to one of four groups; a non-intervention control group and three interventional groups, which involved them receiving either an educational review session and/or an aide-memoir. The study shows the non-intervention control group had an overall accuracy rate of 33%. The provision of either an educational review or aide-memoir significantly increased the accuracy rate of the triage sieve to 57% and 66% respectively. Participants who received both the educational review and aide-memoir had an overall accuracy rate of 65%. This study clearly supports the use of an aide-memoir for maximising MCI triage accuracy rates. The study also provides some clarification on the currently documented under (<5%) and over triage (<50%) rates identified in the literature as acceptable in the context of MCI's.

The Professional Socialisation of Paramedics: A model of paramedic anticipatory socialisation

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Background

This poster presents a model outlining research findings relating to the anticipatory phase of paramedic professional socialisation. The anticipatory phase of professional socialisation describes the development of preconceptions about paramedic practice during childhood and early adulthood. This model forms part of a larger four-phased theoretical model describing the professional socialisation of paramedics.

Methods

Participants (n=15) were sought from several of Australia's larger university paramedic programs and from the University of Hertfordshire paramedic program in the UK to take part in this study. Participants were recruited through university databases and by face-to-face presentations. To be included in this study, participants were required to be paramedic students in the final year of their university studies. Data collection was via face to face semi-structured interviews. Qualitative methods such as theoretical sampling, coding and memo writing were used to analyse the data.

Results

Preconceptions and the reasons for wanting to become a paramedic were divided into four main categories, namely lights and sirens responses, high acuity work, the heroic status of paramedics and helping people. The findings within these categories were mostly built from the students' unrealistic preconceptions about paramedic practice.

Conclusion

The results of this study indicate that for many, the decision to become a paramedic may be built upon unrealistic preconceptions about paramedic practice. These preconceptions can contribute to a reality shock at university and during the transition to the workplace when the reality of practice differs to preconceived expectations.

Stroke identification by paramedics in Perth western Australia.

Judith Finn

Background

We aimed to (1) compare paramedic identification of stroke with the Emergency Department (ED) discharge diagnosis; (2) examine the frequency of paramedics not identifying stroke in patients who were diagnosed as stroke by the ED physicians/registrars; (3) determine how paramedics identify patients with stroke.

Methods

A retrospective cohort study was conducted in the Perth metropolitan area in Western Australia between July 2012 and June 2014 using linked data from ambulance and ED databases. Patients aged 45+ years, transported to ED by road ambulance and assigned the ambulance problem code for stroke were selected. We excluded rural patients, air medical services, or ambulance transfers, e.g. from medical practices, appointments. Sensitivity, positive predictive value (PPV), negative predictive value (NPV) and specificity were calculated. Text fields were examined for documentation that patients met FAST criteria.

Results

2,217 patients were included. Combining two or more of the FAST criteria, paramedics recorded 1,137 patients who were 'FAST positive'. Sensitivity was 52.2%, PPV 45.7%, NPV 99.5% and specificity 99.4%. ED discharge disposition: 87% of patients were admitted, 3% transferred, 9% discharged and less than 1% died.

Conclusion

Identification of stroke can be difficult in the prehospital setting. Stroke tools assist in assessment but factors influencing paramedic decision-making is unclear. Further research is needed.

Does direct rotary wing retrieval of severely injured trauma patients in Western Australia improve survival?

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Summary

Traumatic injury is the leading cause of death in individuals between the ages of 15 and 44 in Australia. WA is a sparsely populated state of approximately 2 million people with over 90% of the population living within a 250km radius of Perth. Severely injured trauma patients in rural WA are transferred to a major trauma centre in Perth because of a lack of specialist expertise in rural areas. Despite this the mortality rate from trauma in rural and remote WA is more than double the rate in major cities.

This paper reports a study undertaken to determine if the mortality rate of directly retrieved severely injured rural trauma patients by helicopter is lower than the mortality rate of indirectly retrieved severely injured rural trauma patients.

The paper reports a review of major trauma (Injury Severity Score, ISS>15) data from the WA Trauma Registry to compare the primary rotary wing retrieval of severely injured rural trauma patients, within a 250km radius of Perth, direct from accident scene with those taken to a regional health facility and indirectly transferred to Perth.

The results of this study will inform health agencies and emergency services on how best to manage severely injured patients in the rural setting.

Community Ambulance Response Trolleys (CARTs): Building Peer Relationships in Australian Catholic University (ACU) Paramedicine Practical Classes.

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Summary

The objective of this project was to explore the effect of implementing the CART system into paramedicine laboratory classes. The system utilises equipment trolleys (CARTs) within paramedicine laboratories at one ACU campus. CARTs house routine paramedicine equipment and effectively mirror an ambulance. Students were assigned to a CART and became responsible for maintaining all equipment utilised in practical classes. It was hypothesised that students would effectively become accountable for managing their equipment.

The CART system aimed to:

1. Encourage communication across classes in order to ensure acceptable equipment upkeep.
2. Foster student relationship development, in turn promoting peer learning and the formation of 'Community of Practices' (CoP)
3. Mimic the equipment management standards and behaviours within the ambulance industry. This was anticipated to improve student's transition into the vocational environment and their engagement with an external CoP in the vocational environment.

A fifteen (15)-item Likert scale questionnaire with opportunity for qualitative comments was used to compare the student experience at a campus where CARTs were used and a campus where CARTs were not used. SPSS software was used to analyse quantitative data.

Data analysis demonstrated positive outcomes associated with the implementation of CART system. These include CoP development, peer learning and improved student transition into the vocation environment. Detailed results and the sustainability of the CART system will be presented.

Researchers conclude that the CART system has had a range of positive outcomes. The system should be considered in other paramedicine practical laboratories.

Survival from a prolonged and remote out-of-hospital-cardiac-arrest (OHCA): Curious of the details, inspired by the outcome.

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Background

Survival from OHCA is often quoted as dismal, particularly when prolonged and remote. We wish to report a patient who survived despite almost 60 minutes of bystander chest compressions (CC) and an 8 hour journey to definitive care.

Methods

HREC approval and informed consent was obtained. We examined logistical and medical interventions and plotted the time (in mins) from OHCA against the 5 domains of the updated Utstein elements: 1) System, 2) Dispatch, 3) Patient, 4) Process, 5) Outcome.

Results

1) Emergency Medical Services (EMS) included Basic and Advanced Life Support and a medical retrieval service. 2) Medical Priority Dispatch System (MPDS) required location verification (2mins) and OHCA recognition (3mins). 3) 58 year old male, witnessed Ventricular Fibrillation (VF) arrest (0mins), unknown aetiology, received bystander CC only (spontaneous respirations). 4) BLS (53mins): VF converted by one Direct Current Counter Shock (DCCS) to rapid Atrial Fibrillation, basic airway, seizure controlled and modified cooling. ALS (87mins): Laryngeal Mask Airway, Intravenous fluid therapy, then fixed wing retrieval to capital city. ALS intensive care unit (ICU) consultant (308mins): endotracheal intubation, controlled ventilation, arterial line, road retrieval to tertiary level hospital. ICU admission (480mins): sedation, controlled electrolytes and mean arterial pressure, modified targeted temperature and angiography (without Percutaneous Coronary Intervention). 5) Cerebral Performance Category 1 at discharge, patient remains fully recovered to date.

Conclusions

By utilising a systems approach we were able to determine that individualisation of treatment to condition and circumstances appears safe.

Crush Injuries: An Educational Overview

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Background

This poster provides an educational overview of crush injuries and its associated syndromes.

Methods

Databases such as PubMed, Science Direct and ProQuest and Google Scholar and clinical guidelines of several ambulance services, plus relevant paramedic clinical textbooks were used to locate the most appropriate information available for this poster.

Results

Crush injuries are due to compressive forces and may lead to more serious syndromes, including shock, crush syndrome, hyperkalaemia and rhabdomyolysis. Crush injuries may occur in any setting, such as elderly patients who have fallen and cannot get up, road traffic accidents and natural disasters. Australian ambulance services have a number of treatments for crush injuries and hyperkalaemia including aggressive fluid resuscitation, tourniquets, sodium bicarbonate, calcium glutamate and salbutamol. These treatments avert the cardio-toxic effects of potassium, manage shock and prevent the patient from developing acute renal failure following their extrication. Paramedics need to recognise symptoms such as ECG changes, hypovolemia, haemorrhage and discoloration of affected limbs in order to provide quick and effective treatment.

Conclusion

This poster has provided an educational overview of the significance of crush injuries and their appropriate treatment. The potential for crush injuries, and associated syndromes, should be recognised early, and emergency management instigated rapidly to avoid patient deterioration and the onset of life-threatening conditions.

Clinical Skills Degradation in Paramedicine Specific to Trauma Management: A Critical Review of the Literature

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Background

Degradation of clinical skills in medicine, nursing and allied health has been well canvassed in the literature. However, within the paramedic paradigm, research appears to concentrate on skills degradation in critical interventions only (eg: advanced airway management and cardiac arrest, both paediatric and adult). Inadequate exploration has been conducted more broadly on skills decay specific to multi-system trauma management in the pre-hospital environment.

Methods

A review of the pre-hospital care literature was undertaken using Cambridge Journals Online; Informa; MEDLINE; Ovid; ProQuest; PubMed; and Wiley Online Library.

Results

A total of 129 studies on clinical skills degradation were located. From this, 49 related to paramedics and skill degradation. Of these, six related to paediatrics; 14 to advanced airway management and cardiac arrest.

Conclusion

Very few peer-reviewed articles focused on skills specific to adult multi-system trauma, or trauma management such as needle thoracocentesis, haemorrhage control, fracture and traumatic brain injury management. Subsequently, a gap in the literature has been highlighted in relation to pre-hospital skills retention in adult trauma management. This presentation discusses the current state of the evidence on the tenets of skills retention in adult trauma care as they relate to the paramedic profession.

How accurate is Ambulance Officers' working diagnosis of patients presenting with dyspnoea?

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Introduction

Patients with dyspnoea are commonly attended by Ambulance Officers, and such patients can range in severity from mild to life-threatening. An accurate working diagnosis is important to ensure correct treatment. Our aim: to investigate accuracy of Ambulance Officer working diagnosis in comparison to hospital diagnosis of dyspnoea patients. Accuracy in relationship to Ambulance Officer level of practice and patient medical condition was also investigated.

Method

Non-consecutive patient report forms 1 April to 31 August 2011 were retrospectively audited for ambulance patients with dyspnoea, in Auckland, New Zealand. Documented or clearly inferred working diagnoses were extracted. Primary and secondary Emergency Department diagnoses and hospital discharge diagnosis were compared with the pre-hospital working diagnosis.

Results

The study cohort was 292 patients, of whom 224 (76.7%) had an Ambulance working diagnosis. Of these, working diagnosis was accurate in 166 (74.1%). Ambulance Officers with higher levels of practice exhibited greater diagnostic accuracy, compared to their more junior colleagues ($p=0.05$). However, these most senior ambulance officers were less likely to document a working diagnosis (30/98 cases had no diagnosis documented) compared to their most junior colleagues (15/92). Accuracy of working diagnosis varied according to medical condition: asthma and COPD were accurate >90%, acute pulmonary oedema 72%, chest infection 55%.

Conclusions

Overall, accuracy of Ambulance Officer working diagnosis was moderate. Diagnosis of some conditions was stronger than others. The study was limited by the retrospective chart review methodology. Ambulance patient report forms should be changed to encourage documentation of a clear working diagnosis

Perimortem caesarean section: Every second counts

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Background

To review the current literature regarding the efficacy of perimortem caesarean section (PMCS) and its potential application for paramedics in the prehospital setting.

Method

The following databases were searched via the Auckland University of Technology (AUT) library: ClinicalKey, Cochrane Library, EBSCO, MEDLINE, OVID. Specifically articles were evaluated to investigate if the procedure could be applicable to the prehospital paramedic scope of practice.

Keywords: Perimortem caesarean, pre-hospital, prehospital, EMS.

Inclusion criteria: seminal articles, less than 15 years old, English language, potential relevance to paramedic practice.

Results

Over 300 articles were screened, 25 were selected. These were single case reports and reviews. The nature of PMCS makes randomised trials impossible. Case reports demonstrated that the earlier a PMCS was performed following maternal cardiac arrest the better the chances for neonatal survival without neurological impairment. Some case reports demonstrated return of spontaneous circulation in mothers who underwent PMCS. While there was obvious selection bias in the case reports there was no published evidence that performing a PMCS worsened outcomes for mother or child.

Conclusions

PMCS has been demonstrated to be effective in the hospital setting. Current literature suggests that the earlier PMCS is performed the better the chances for good neurological outcome for the neonate, and potentially the mother. The current recommendation is that PMCS is completed within five minutes of maternal arrest. Given this extremely short time frame a place for PMCS within the paramedic scope of practice should be considered.

Incidence, characteristics, and survival of out-of-hospital cardiac arrest (OHCA) in children and adolescents between 1997 and 2014 in Perth, Western Australia

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Background

This study aimed to describe trends in the incidence, characteristics, and survival of paediatric OHCA in Perth, Western Australia (WA) over the last 18 years.

Methods

We undertook a population-based cohort study of OHCA patients aged <18 years, attended by paramedics in Perth between 1997 and 2014. Cases were identified from the St John Ambulance WA (SJA-WA) data; which was linked with the WA death registry and Emergency Department (ED) data. Neurological status at hospital discharge was determined by medical record review. The incidence, characteristics, and survival were compared across the four-year periods (1997-2000, 2001-2005, 2006-2010, and 2011-2014). Incidence rates as per 100,000 population were separately calculated by age groups (aged <1, 1-4, 5-12, and 13-17 years) and by external/non-external causes.

Results

Overall, 723 OHCA cases were identified, of which 451 cases (62%) received cardiopulmonary resuscitation (CPR) by paramedics. The median age was 2 years and the patients were predominantly male (62%). The initial cardiac arrest rhythm was 'shockable' in 43 (7%) cases. Bystander CPR rate significantly increased from 35% (1997-2000) to 63% (2011-2014) ($p < 0.001$). The incidence rate decreased from 14.1 (1997-2000) to 8.7 (2011-2014) per 100,000 population ($p < 0.001$). Of the 451 patients, 21 survived to hospital discharge. Eleven patients (55%) had good neurological status on discharge (one patient was lost to follow-up).

Conclusion

The incidence of paediatric OHCA has decreased over time and survival remains low. Strategies to improve the chain of survival for paediatric OHCA need to be considered.

Delayed Sequence Intubation and Apnoeic Oxygenation

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Summary

Preoxygenation is a critical step in advanced airway management and serves to enhance the time available for intubation prior to desaturation when patients are at additional risk. The average patient breathing room air will experience significant desaturation below the critical 90% level within 45-60s post administration of a paralytic.^{1,2} Though preoxygenating elective patients in an anaesthesia setting is relatively straightforward, the emergency and prehospital arena present unique challenges with respect to airway management. The ideal goal is three minutes of adequate breathing of 100% oxygen², something that is difficult to achieve in the best of circumstances. Traditional methods to preoxygenate patients prior to rapid sequence induction (RSI) include the use of a non-rebreather mask or bag valve mask.

There are some situations wherein the patient's condition makes it especially challenging to optimise preoxygenation. Examples would include combative or delirious patients. In these cases, an innovative technique of delayed sequence intubation (DSI) coupled with apnoeic oxygenation is a viable alternative to maximise patient safety. DSI involves administering a drug like ketamine to safely sedate the patient and facilitate preoxygenation. If still required, this is followed by a standard RSI procedure wherein oxygen is continually administered via nasal prongs during the apnoeic period.² The purpose of this poster is to present the techniques of DSI and apnoeic oxygenation to the prehospital provider, keeping them informed of innovative approaches to airway management.

Accuracy of tympanic temperature measurement in firefighters completing a simulated structural firefighting task.

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Background

In the course of their duties, firefighters risk heat stroke and other medical conditions due to exertion in high temperature environments. Infrared tympanic temperature measurement is often used by ambulance to assess the core body temperature of firefighters. The accuracy of tympanic temperature measurement in this setting has been called into question. This study aims to examine the accuracy of tympanic temperature (T_{Tym}) for core body temperature assessment at emergency firefighting events compared with gastrointestinal temperature (T_{GI}) as measured by ingestible thermometers.

Methods

Forty-five (42 male, 3 female) professional urban firefighters from an Australian fire service completed two 20-minute work periods in a 100 ± 5 °C heat chamber while wearing personal protective clothing and breathing apparatus (~20kg). Measurements were taken immediately before entering and on exiting the heat chamber. T_{Tym} was assessed by an infrared tympanic thermometer and T_{GI} was measured by ingestible sensor and radio receiver.

Results

Complete data were available for 37 participants. Participant temperatures were higher on exiting the heat chamber than at baseline (T_{Tym} : 35.9°C (0.7) vs 37.5°C (0.8); T_{GI} : 37.2°C (0.4) vs 38.6°C (0.5)). T_{Tym} underestimated T_{GI} on average by 1.3°C (0.5) before entering the chamber and by 1.0°C (0.8) following the exercise. Using pooled data, the average underestimation was 1.2°C (0.7).

Conclusion

Tympanic thermometers are an unreliable measure of core body temperature for firefighters engaged in fire suppression activities.

CPR retention rates in healthcare professionals and students: A systematic review

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Background

CPR retention rates in healthcare professionals and undergraduate students are difficult to measure and challenging to maintain. Trained medical, nursing and paramedic students can experience a significant reduction in Basic Life Support (BLS) and Advanced Life Support (ALS) skills in as little as three months. This study identifies the main skills retained and lost, and potential methods to improve retention rates.

Methods

A search was conducted using the Cochrane Library, Ovid MEDLINE and SCOPUS databases between August and October 2014.

Results

The search located 671 articles, 15 of which met the inclusion criteria. Five studies were conducted in a hospital environment, seven in universities and one in a nursing school. This study identified that the skill most easily retained was application of chest compressions. ALS skills were most easily lost, particularly the ability to detect ventricular fibrillation (VF). The four main influences that affected retention were: feedback and evaluation provided by an instructor; clinical experience; prior learning; and quality of instruction. It is likely that improvement in these areas will lead to an increase in retention of BLS/ALS skills.

Conclusion

More research is needed on paramedic students, to determine how their retention rates compare to those of medical and nursing students and specifically their ability to detect VF. The author plans to use these results to initiate further research; to quantify the extent of the problem; and to develop more effective teaching methods, in order to improve retention of BLS/ALS skills.

Exploring obstetric specialised clinical placements for undergraduate paramedic students

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Background

A pilot of a three week obstetric clinical placement within a maternity ward was undertaken by 35 paramedicine students, as part of a theoretical obstetric and paediatric paramedic practice unit. Ethical approval was received to conduct an evaluation of this placement, using a case study approach. Specifically, this evaluation aimed to explore the suitability of the obstetric environment for paramedic students' clinical teaching and learning.

Methods

Multiple focus group discussions were held separately with paramedic students and clinical staff, following recruitment into the study. Students' clinical placement and skills assessment logs were also collected for document analysis. Document analysis of student reflections and skills logs was conducted to identify the paramedic skills developed, and thematic analysis of focus group data was undertaken to explore themes relevant to the teaching and learning experience for paramedic students.

Results

Findings from the evaluation of this placement indicate that more than 30 assessed paramedic psychomotor skills were developed by students, directly related to the undergraduate paramedic curriculum. Additionally, several broader clinical skills were. Preliminary findings from focus group data highlight both barriers and enablers to a positive learning experience for paramedic students in this placement setting. The evaluation found that overall, paramedic students considered this to be a valuable opportunity for learning.

Conclusion

This presentation reports on the successful piloting of an obstetric specialised clinical placement for undergraduate paramedic students. Whilst the suitability of similar placements outside of this case study remains unknown, these findings can inform future placements and clinical education for paramedic students.

From Qualified to Specialist Paramedic: A qualitative study of the process of transition to a low-acuity role.

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Summary

Paramedics are increasingly seen as an integral component of the healthcare continuum. While the traditional core functions of ambulance services are to treat and transport the sick and injured to hospital, a significant paradigm shift in the care of low-acuity (non-urgent) patients has been gathering momentum over the last two decades. However little is known about why paramedics seek to specialise in a low-acuity role. Unlike the medical and nursing literature that has been published in the area of work-role transition, there are no studies which specifically examine the process of transition from qualified paramedic to specialist paramedic in a low-acuity role. This research is a qualitative study informed by constructivist grounded theory to explore the process of transition of paramedics to a specialist low-acuity role. The international study sites include Extended Care Paramedics in New South Wales and South Australia as well as Community Paramedics in Alberta Province, Canada with data collection anticipated to begin in September 2015. An understanding of the process of transition may translate to enhancements in the recruitment, selection and retention of paramedics in a low-acuity role, improvements in paramedic education programs and the more efficient operationalisation of new low-acuity services by decreasing the time to deploy high-quality, ready-to-work paramedics in the field. Ultimately, the research will generate new knowledge that may inform policy and models of care to deliver a measurable impact on both effectiveness (clinical outcomes) and efficiency (service delivery).

An exploration of future integration opportunities for Community Paramedics in country South Australia

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Background

The purpose of this scoping project was to explore opportunities for SA Ambulance Service to support and integrate Community Paramedics into existing Country Health SA Local Health Network (CHSALHN) initiatives, to improve patient outcomes in rural areas.

Methods

A paramedic with research experience was seconded to Country Health SA for two months to investigate integration opportunities within existing Country Health SA Local Health Network initiatives and report on observational findings.

Results

The cross-agency secondment and observational placements with allied health professionals, has proven fundamental in forging inter-agency partnerships and enhancing communication and collaboration at a local level, which is pivotal in the planning and implementation of expanded practice models in paramedicine. A number of integration opportunities were identified for Community Paramedics to support existing health service initiatives including the potential for Community Paramedics to support country patients involved in a chronic disease management program.

Conclusions

Community Paramedics have the potential to play a crucial role in supporting existing CHSALHN initiatives and filling health service gaps in rural South Australia. The chronic disease management program is one example of several future integration opportunities being explored between SAAS and Country Health. SA Ambulance Service is piloting a Community Paramedicine program in late 2015.

Quantification of opportunities for early-stage paramedicine students to practice clinical skills during clinical placements compared to an equal dose of simulation-based workshops

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Background

A reported advantage of simulation-based learning environments (SLE) over clinical placements (CP) is the former can provide of a greater number and breadth of opportunities to practice level-appropriate clinical skills compared to the random patient presentations provided during the latter. Although logical and widely accepted as fact, we find no published evidence to demonstrate the magnitude, nor indeed veracity, of this assumption. We therefore sought to quantify the clinical skills practiced by entry-level paramedicine students attending a well-selected CP compared to an equal dosage of SLE.

Methods

N=37 first-year paramedicine students completed activity diaries during three days' CP and three days' SLE. Opportunities to practice clinical skills were quantified and coded as either: level-appropriate, beyond-level, or of non-discipline relevance.

Results

During SLE the average student was exposed 226 times to 11 level-appropriate clinical procedures. During CP the average student was exposed 48 times to 24 clinical procedures, most relevant to paramedicine (63%) but a minority level-appropriate (38%). Students' opportunities for supervised, 'hands on' practice represented only 10% of exposures in either SLE or CP but in terms of raw numbers of level-appropriate opportunities, SLE provided more than CP (n=23 v. 2).

Conclusion

Our results confirm SLE provides substantially more opportunities than CP for students to practice level-appropriate skills and is therefore more appropriate for repetitive practice. However, CP is likely to remain useful to students for practicing interpersonal skills and contextualisation of knowledge within the broader health system. Educators should therefore carefully articulate learning objectives before choosing between SLE and CP.

The effects of low- versus high-fidelity simulations on the cognitive burden and performance of entry-level paramedicine students: A mixed-methods comparison trial using eye-tracking, heart-rate, difficulty scales, video observation and interviews

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Background

High fidelity simulation-based training is often avoided for early-stage students due to the assumption that while practicing newly learnt skills they are ill-suited to processing multiple demands which can lead to 'cognitive overload' and poorer learning outcomes. We tested this assumption using a mixed-methods experimental design manipulating psychological immersion.

Methods

N=39 randomly assigned first-year paramedicine students completed low- or high-environmental fidelity simulations (LF_{en}S vs. HF_{en}S) involving a standardised patient with obstructed airway (SimMan3G). Psychological immersion and cognitive burden were determined via continuous heart-rate (HR), eye-tracking, self-report questionnaire (NASA-TLX), independent observation, and post-simulation interviews. Performance was assessed by successful location of obstruction and time-to-termination.

Results

Eye-tracking confirmed students attended to multiple, concurrent stimuli in HF_{en}S and interviews consistently suggested they experienced greater psychological immersion and cognitive burden than their LF_{en}S counterparts. This was confirmed by significantly higher average HR ($p < .001$), NASA-TLX mental demand ($p < .05$) and independently observed episodes of cognitive overload (4 vs. 2, $p = \text{NS}$). However, HF_{en}S students revived the patient more often than LF_{en}S students (58% vs. 30%, $p < .10$) and significantly more quickly ($p < .01$) too. LF_{en}S students had low immersion resulting in greater assessment anxiety.

Conclusion

HF_{en}S engendered immersion and a sense of urgency in students while LF_{en}S created assessment anxiety and slower performance. We conclude that once early-stage students have learnt the basics of a clinical skill, throwing them in the 'deep end' of high-fidelity simulation creates significant additional cognitive burden but this has considerable educational merit. Essentially, early-stage students appear more resilient than has previously been assumed.

Clinical Telephone Triage in the Prehospital Setting – Is it Safe and Effective: A systematic review.

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Background

Clinical telephone triage in an ambulance environment has been used to reduce unnecessary ambulance responses to low acuity patients to manage demand and increase availability for life threatening emergencies. This review examines literature to determine if telephone triage is safe and effective.

Methods

Studies that reviewed clinical telephone triage in an ambulance setting were included as well studies that reviewed the safety of telephone triage within other settings. Eight studies were included for final review.

Results

The majority of papers established that clinical telephone triage was safe with low levels of reported adverse events, but that larger studies are recommended to confidently assess a stable level of adverse events. Four papers assessed the efficacy of clinical telephone triage in an ambulance setting. All studies showed positive results, but the level of efficacy varied significantly due to very different trial inclusion criteria.

Conclusion

Results suggest that the safety of clinical triage has been proven and that further studies only need to be performed to accurately assess the level of adverse events. Efficacy of clinical triage has been proven with differing levels of success and larger trials which are more robust and controlled need to be undertaken to gain an accurate level of efficacy.

Informing clinical policies: The NSW Ambulance knowledge translation model.

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Background

The process of translating evidence from research studies to actively influence clinical or operational practices within ambulance or emergency medical services (EMS) is yet to gain its full momentum.

This presentation has two aims: 1) to outline the development of a knowledge translation model that has been adopted by NSW Ambulance; and, 2) to provide a practical example of how the model has been used to inform clinical policy changes.

Methods

To address aim one, a two-step approach was used. First, two reviews were undertaken: 1) the academic EMS literature, and 2) the wider healthcare literature. Secondly, an internal stakeholder consensus process was conducted. For aim two, a case study approach was used to demonstrate the practical utility of the NSW Ambulance knowledge translation model.

Results

The final model is comprised of six phases: 1) generate locally relevant knowledge; 2) seek and synthesise evidence; 3) decision-making; 4) construct or amend; 5) implement, and; 6) evaluate.

The case study demonstrated the practical utility of the new model by describing its application to the review of the Cervical Spine Injury Assessment policy – the first policy to be subjected to the new process.

Conclusions

To bring evidence into action, a six-phase knowledge translation model has been developed and successfully implemented in NSW Ambulance. The model provides an auditable map of the policy decision-making process and has the potential to underpin the development of national, centrally coordinated clinical practice guidelines that can be adapted by state-based ambulance services to meet local needs.

Is intravenous magnesium sulphate widely used within the prehospital environment in Australasia to treat asthmatic patients, and what evidence supports its use?

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Background

This study assesses whether intravenous (IV) magnesium sulphate is used within the prehospital environment of Australasia to treat asthma and what evidence supports its use.

Method

The Clinical Practice Guidelines (CPGs) of Australasian prehospital emergency care providers were reviewed to see if IV magnesium sulphate was included for treatment of bronchospasm. A systematic search was conducted using Cochrane Library, Ovid Full Text Journal, and EBSCO Megafire databases, and the following key words: asthma, bronchospasm, magnesium, prehospital. Inclusion criteria were: clinical trials using IV magnesium to treat bronchospasm, and within the prehospital environment.

Results

16 prehospital emergency care providers were identified (11 Ambulance services, 2 defense forces, and 3 private prehospital medical providers): 11 services provided their CPGs. Six of these services do not use IV magnesium sulphate, whereas the other five services do include it as part of their CPGs for severe/life threatening asthma only. 13 clinical trials met inclusion criteria. Findings were mixed. While ten trials provided evidence of some improvement in pulmonary function when compared with placebo, three trials showed no improvement when IV magnesium was used as an adjunct to standard treatments.

Conclusion

While there are several prehospital providers who include IV magnesium sulphate as part of their treatment of asthma, there is mixed evidence to suggest that it should be used prehospitally. Although the majority of trials suggest that magnesium improves pulmonary function in asthmatic patients and support its use, other trials suggest that its role and efficacy require further clarification.

Autoresuscitation: The Lazarus Phenomenon

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Background

Autoresuscitation, defined as unassisted Return of Spontaneous Circulation after cardiac arrest, is a rare phenomenon. This study reviews the literature on autoresuscitation, examining its incidence, and reviewing the proposed pathophysiology and mechanics, with a focus on dynamic hyperinflation. Current practice in pre-hospital cardiac arrest is reviewed and changes for future practice are proposed.

Methods

A literature search was undertaken accessing OVID and SCOPUS databases. Keywords included: autoresuscitation, Lazarus phenomenon, dynamic hyperinflation and pre-hospital cardiac arrest.

Results

Of the 47 cases located in the academic literature, 42 documented outcome; 45% of these achieved a full neurological recovery. Under-reporting due to ignorance or fear was probable. In all recorded instances, autoresuscitation occurred post cardiopulmonary resuscitation. Several mechanisms have been postulated; the most popular is dynamic hyperinflation attributable, in part, to hyperventilation by rescuers during resuscitation. There is a documented correlation between hyperventilation, dynamic hyperinflation and pulseless electrical activity. Despite changes in resuscitation guidelines, hyperventilation is still prevalent in the prehospital setting because paramedics use crude methods to monitor ventilation rate and volume. Reducing the occurrence of hyperventilation has been associated with increased survival. Changes in paramedic practice along with real-time monitoring could contribute to improved outcomes.

Conclusion

Autoresuscitation is grossly under-reported worldwide. Although a rare event, paramedics need to be aware of this phenomenon and healthcare professionals need to be empowered to report occurrences. By understanding the underlying pathophysiology and addressing ventilation aberrancies, dynamic hyperinflation, the most common cause of autoresuscitation, can be reduced, in pre-hospital cardiac arrest.

Agreement between student paramedics when auscultating blood pressure on healthy volunteers – A pilot study.

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Background

Blood pressure (BP) is an important indicator of physiological status and a key feature of the primary survey. Previous research exploring teaching and learning outcomes has reported poor accuracy in BP measurement when performed by student paramedics on manikins, but the agreement between students when performed on humans has not been studied. The objectives of this pilot project were to 1) determine statistical agreement between student paramedics when measuring BP on healthy volunteers; 2) provide pilot results to inform design of a larger study; and 3) validate teaching and learning activities in an undergraduate program.

Methods

A prospective cohort study design was used, with student paramedics measuring BP on healthy volunteers. BP was auscultated simultaneously by two students using a two-headed stethoscope. Paired T-tests were used to compare mean measures, and intra-class correlation coefficient (ICC) and Bland Altman plots to assess agreement.

Results

Pairs of measurements were taken on 40 subjects. The mean difference in measurement was -1.1 mmHg (95% CI -3.77 -1.57; $p=0.41$) for SBP and 1 mmHg (95% CI -1.67-3.67; $p= 0.45$) for DBP. Bland-Altman analysis confirmed these findings, with 1.1 mmHg (95% limits of agreement -17.44 to 15.24) for SBP and 1 mmHg (95% limits of agreement -15.11 to 17.12) for DBP. ICC indicated excellent agreement for systolic BP (0.92; 95%CI 0.85 - 0.96) and good for DBP 0.82 (95%CI 0.65 -0.90).

Conclusion

Student paramedics demonstrated high levels of agreement when measuring BP on healthy volunteers, validating teaching and learning activities in this undergraduate program.

Accuracy of student paramedics when measuring adult respiratory rate - A pilot study.

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Background

Abnormal respiration rate (RR) is commonly undervalued in the out-of-hospital environment despite its use as a predictive marker for physiological decline. Failure to accurately measure RR may lead to delayed recognition of the deteriorating patient. While accuracy of measurement and recording of RR has been reported in allied health settings, no evidence exists in the context of paramedicine. The study aims to 1) determine the accuracy of manually measured RR when taken by University of Western Sydney (UWS) second year student paramedics on healthy volunteers in a simulated environment and 2) to inform study design of a larger study.

Methods

This pilot study utilizes a double-blinded cohort design. Student paramedics manually record RR along with a range of vital signs including non-invasive manual blood pressure (NIBP), heart rate (HR), oxygen saturation (SpO₂), temperature (Temp) and 4 lead ECG on healthy volunteers. Neither the subjects nor the students were aware of the specific aims of the study. Capnography was used as the gold standard (as in hospital environments) to confirm observed respiratory rates.

Results

On completion of the study 30 unique RR measurements will have been taken. Descriptive statistical analysis will occur and agreement between capnography and student RR will be assessed via intra-class correlation coefficient (ICC) and Bland-Altman analysis.

Conclusion

The results of this study will provide new knowledge that will influence evaluation of teaching and learning methods for undergraduate paramedicine students and highlight the importance of paying diligent attention to accurate measurement of out-of-hospital respiratory rate.

Risk of representation or death in patients discharged at the scene by paramedics.

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Background

We aimed to describe the risk of re-presentation and/or death in prehospital patients discharged at the scene by paramedics.

Methods

We conducted a retrospective cohort study using St John Ambulance Western Australia data linked to emergency department (ED) and death data. We compared outcomes in patients who were discharged at the scene by paramedics with those who were transported to ED by paramedics and then discharged from ED between January 1 and December 31, 2013 in metropolitan Perth, Western Australia. Occurrences of subsequent ambulance requests, ED attendance, hospital admission and death were compared between those discharged at the scene and those discharged from ED.

Results

During the study period, 19,732 patients attended by paramedics were discharged at the scene and 27,598 discharged from ED. Compared to those discharged from ED, those discharged at the scene were more likely to subsequently: request an ambulance (adjusted odds ratio [adj OR] 3.4; 95% confidence interval [CI] 3.0-3.9), attend ED (adj OR 3.3; 95% CI 2.8-3.8), be admitted to hospital (adj OR 4.2; 95% CI 3.4-5.1) or die (adj OR 1.8; 95% CI 1.0-3.2) within 24 hours of scene discharge.

Conclusion

Patients attended by paramedics who were discharged at the scene had more subsequent events than those who were transported to and subsequently discharged from ED. Assessing suitability for discharge at the scene by paramedics requires further consideration.

The role of morphine in acute coronary syndrome: Are there safer alternatives?

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Summary

This paper was written with the intention of assessing the role of morphine in acute coronary syndrome (ACS). Morphine has traditionally been used to treat many forms of acute pain in a prehospital setting, including chest pain experienced during acute coronary syndrome. Recent research, however, suggests the routine administration of morphine as an analgaesic in ACS can cause serious drug interactions. These interactions have the potential to limit and/or delay the effects of many prehospital pharmacological interventions, themselves proven to be lifesaving. Morphine administration can delay absorption of clopidogrel, reduce levels of its active metabolite by 34% and delay maximal inhibition of platelet aggregation by an average of 2 hours. Morphine has also been shown to increase incidence of vomiting from 2% to 15%. Additionally, the efficacy of tenecteplase and prasugrel in reducing platelet reactivity is decreased when given in conjunction with morphine. This paper also assessed clinical guidelines and protocols of many Australian states and determined that some states have changed practice to administer fentanyl, while others still prefer morphine in ACS. This is likely due to morphine's increased anxiolytic effects and the potential for interaction between fentanyl and amiodarone. These drugs were compared and the benefits of using fentanyl over morphine appear to justify the change made by some states. The evidence suggests that randomised control trials directly comparing the two medications are needed and have potential to decrease mortality from ACS.

The effect of pre-hospital delays on asthma severity

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Background

When managing a patient with severe asthma in the pre-hospital setting a common perception amongst paramedics is that an increased amount of time spent on scene is associated with increased mortality and morbidity. This study assessed whether there was a correlation between the total time from initial call to emergency ambulance service (EAS) to hospital arrival, and also the amount of time spent on scene with patient status on arrival at hospital.

Methods

Data was collected from ambulance patient care records for an eight week period, 31 May – 31 July 2014. A total of 206 adult patients with asthma were included in the study. Of these 155 were transported to hospital, 76 of which were classified as having severe asthma.

Results

The results indicated that for 30% (n=25) of patients with severe asthma, time on scene exceeded 20 min. There was no correlation between time spent on scene and the status of the patient on arrival at hospital ($p=0.29$, $r^2 = 0.084$). For 40% of patients the asthma severity remained the same, 56% of patients improved and 4% of patients deteriorated. Similar results were found for the total time from initial call to EAS to arrival at hospital with no direct correlation between the total time spent pre-hospital and the final patient status ($p=0.79$, $r^2<0.5$).

Conclusion

The study results indicate that an increased amount of time spent pre-hospital may not adversely affect a patient's severity; however, there is scope for further research in this area.