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Whitireia paramedics on the road: How have educational choices supported occupational longevity, promotion and retention?

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Introduction

New Zealand professional paramedicine is coming of age. Tertiary paramedic education has been available for almost 20 years, but once students graduate, little is known about subsequent career progression. The Whitireia New Zealand paramedic degree cohort were traced to explore attrition, promotion and longevity within the paramedic workforce.

Methods

All 508 Whitireia Bachelor of Health Science (Paramedic) graduates (2004–2017) were approached to participate by email. A link was provided to an online questionnaire, which comprised 25 forced response questions covering paramedic practice, occupational pathway, attrition and further study. Qualitative narrative data was obtained through free response questions. Descriptive statistics and thematic analysis were used to explore the data.

Result

One hundred and fifty-nine Whitireia paramedic graduates participated in the study, indicating a 31% response rate. Ninety-two percent were currently working in New Zealand, 87% were employed in an ambulance service and 84% worked fulltime. The majority of responders were frontline emergency (68%) or Emergency Care Paramedics (22%). Fifty-five percent held Paramedic Authority to Practice (ATP), 31% Emergency Medical Technician ATP, and 6% held Intensive Care Paramedic ATP. Thematic analysis identified general satisfaction with the New Zealand model of education, but dissatisfaction with career advancement opportunities and resourcing. Further analysis is ongoing.

Conclusion

Preliminary analysis suggests that New Zealand paramedics experience career longevity and limited attrition. Whitireia paramedic graduates remain and practise in New Zealand, disputing the accepted wisdom of graduate enticement overseas.

Pre-hospital provider relevance

New Zealand trained paramedics remain and practise in New Zealand, but dissatisfaction with career advancement opportunities and under-resourcing may prompt attrition. Impending paramedic registration may increase the alternative career opportunities available, therefore in order to promote career longevity, a structured, accessible career pathway should be available to all degree qualified paramedics.

An evolution of the MANERS model as a framework for peer support

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Introduction

In 2014, Wellington Free Ambulance (WFA) redeveloped their peer support program using the MANERS (**M**inimise exposure, **A**cknowledge the event, **N**ormalise the experience, **E**ducate as required, **R**estore or refer, **S**elf care) model, an evidence-based framework for providing support following a potentially traumatising event (PTE). Peer support based on the MANERS crisis intervention framework hasn't been evaluated in New Zealand, nor is it clear whether all aspects of the MANERS model provide useful, employable knowledge or skills to those receiving support.

Methods

Wellington Free Ambulance have 15 paramedic volunteer peer supporters who average 11 calls or contacts per month. Fifty percent are initiated by PTEs and 38% by known distress. Participants were asked to complete a brief, anonymous online survey using quantitative and qualitative response format following contact with peer support. Questions explored the usefulness of the service, satisfaction and areas for improvement. Data collections and analysis is ongoing, with interim results presented.

Results

Of the 37 WFA employees contacted by peer support over a 3 month period, 15 completed the evaluation, indicating a 40% response rate. Contact was made within 72 hours of the PTE in 60% of cases, reported by 60% as satisfactory. The majority found peer support helpful (67%), supportive (93%) and valuable (67%), and the supporter courteous (87%) and empathetic (80%). Fifty-four percent indicated that peer support helped understand and normalise their response to a PTE.

Conclusions

Peer support based on the MANERS model is perceived as beneficial by WFA employees contacted following exposure to a PTE. Paramedic mental health must be protected and peer support has been shown to provide help and guidance for those most at risk.

Pre-hospital provider relevance

Peer support provides a cost effective intervention for paramedics exposed to PTEs. The MANERS model has been shown to provide a useful framework for providing a successful peer support program within a busy urban ambulance service.

Exploring paramedic perceptions of incorporating primary healthcare in practice and the development of a tool to assess patient health resilience

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Introduction

Meeting healthcare needs in rural communities remains a challenge. Many paramedics recognise primary healthcare elements of their practice, however, barriers exist to implementing primary healthcare-based strategies. This study explores paramedics' perceptions of augmenting their practice, recognising their unique access to patients at home, with the introduction of a tool to measure sense of coherence, general resistance resources, and social determinants of health (SDH) to help guide them in such cases. The aim of this assessment is to assist building patient resilience to improve outcomes in current and future health events using a salutogenic approach.

Methods

A questionnaire was administered to 146 rural paramedics, exploring their perceived knowledge of health disparities in their communities, the impact of SDH, and their roles as frontline care providers. This aimed to establish the feasibility of utilising a salutogenic approach within paramedics' current scope of practice.

Results

Most participants recognised a need to move toward salutogenic approaches to healthcare. Results found 73.1% of participants would be highly likely to refer patients to services if they recognised a need and were aware of a service that may be able to assist. Results highlighted paramedic perceptions that their unique access to patients provided opportunities for more holistic assessments and improved referral pathways. Some participants expressed concerns around creating additional stress on already overburdened systems.

Conclusions

This project sets the platform for the adoption of a salutogenic approach to paramedicine and explores new avenues for paramedic practice in line with the evolution of the profession.

Pre-hospital provider relevance

Paramedics are regularly faced with patients requiring a primary healthcare approach. Navigating these situations is complex. The addition of assessment tools empowers paramedics. However, before a tool is developed, it is critical to establish how paramedics view the need for the approach and would engage with it practically and culturally.

Paramedic-delivered fibrinolysis in the treatment of STEMI: Comparison of a physician-authorized versus autonomous paramedic approach

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Introduction

Timely provision of fibrinolysis in the treatment of ST-elevation myocardial infarction (STEMI) confers the greatest clinical benefit. This rationale underpins paramedic-delivered fibrinolysis in the pre-hospital setting. However, the current New Zealand approach requiring paramedics to gain physician authorisation prior has proved costly and time consuming. This study aimed at trialling a new autonomous paramedic-delivered fibrinolysis model to examine the accuracy of paramedic diagnosis and the impact on time to treatment and patient outcome.

Methods

Over a 24-month period, paramedics identified patients with a clinical presentation and electrocardiogram features consistent with STEMI, and initiated fibrinolysis. These patients were compared to an historic cohort who received fibrinolysis by paramedics but following physician authorisation. The main outcome measures were pain-to-needle (PTN) time and accuracy of paramedic diagnosis. A secondary end-point was mortality at 30 days and 6 months, and hospital length of stay (LOS).

Results

A total of 174 patients received fibrinolysis (mean age of 64 years, SD \pm 11.2). Median PTN time was 87 minutes (IQR = 58) for the historic cohort (n = 96), versus 65 minutes (IQR = 31) for the experimental cohort (n = 78), (p = 0.007). Autonomous paramedic diagnosis showed a sensitivity of 96% (95% CI 89 to 99) and specificity of 91% (95% CI 76 to 98). A significant reduction in both 30-day mortality and hospital LOS was observed among the experimental cohort (p = 0.04 and <0.001 respectively).

Conclusion

Pre-hospital fibrinolysis provided on the initiative of paramedics is safe and feasible and can significantly improve time to treatment, resulting in short term mortality benefit and reduced hospital LOS.

Pre-hospital provider relevance

This study serves as a benchmark that invites other ambulance providers to introduce a similar paramedic model of care tailored to their own local setting and adhering to the same standards.

The appropriateness of cases presenting in the emergency department following ambulance service secondary telephone triage

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Introduction

An increasing proportion of ambulance service workload involves low-acuity patients that do not require emergency department (ED) care. Secondary telephone triage aims to reduce the low-acuity workload for emergency ambulances and EDs, however, some cases may unnecessarily remain or re-emerge in these emergency care pathways. This study investigated the appropriateness of ED presentations following ambulance-based secondary telephone triage.

Methods

A pragmatic retrospective cohort analysis of the planned and unplanned ED presentations following secondary telephone triage was conducted. Cases triaged between September 2009–June 2012 were linked to ED and hospital admission records (N=44,523). Planned ED presentations were cases referred to the ED following secondary triage, unplanned ED presentations were cases that presented despite being referred to alternative care pathways.

Appropriateness was measured using an ED suitability definition and hospital admission rates. These were compared to mean population data of all of the ED presentations for Victoria ('average Victorian ED presentation').

Results

Planned ED presentations were more likely to be ED suitable than unplanned ED presentations (OR 1.62; P<0.001) and the average Victorian ED presentation (OR 1.85; P=0.046). They were also more likely to be admitted to the hospital than the unplanned ED presentation (OR 1.5, P<0.001) and the average Victorian ED presentation (OR 2.3, P<0.001).

Conclusion

The cases the secondary telephone triage service referred to the ED were more appropriate for the ED than cases that presented despite being referred to other services, and more appropriate than all of the Victorian ED presentations during the study timeframe (ambulance and non-ambulance presentations).

Pre-hospital provider relevance

To manage increasing demand, some ambulance services internationally have implemented secondary telephone triage services to divert the increasing number of low-acuity cases to care pathways better matching their needs. There is much variation between these services and almost no evidence about the appropriateness of the triage decisions.

Comparison of prone and kneeling intubation in mannequin model with limitation of neck movement, a cross over design

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Introduction

Endotracheal intubation is the lifesaving procedure for airways management in critically injured patients. In the situation of pre-hospital care, to intubate a patient who is lying on the floor is more difficult, especially in a traumatically injured patient who needs cervical spine restriction. This study aims to compare the optimal position between prone and kneeling intubation in the case where the limitation of neck movement is necessary.

Methods

This was an experimental study conducted in the Faculty of Medicine Ramathibodi Hospital. Paramedic students participated in the intubation of the supine mannequin model to which was applied a cervical hard collar. The participants were assigned by SNOSE to intubate in a prone or kneeling position as the first method, then performed the alternate method 7 days later. Study outcomes included percentage of successful intubation, time to perform intubation successfully and Cormack and Lehane's classification of laryngeal view.

Results

There were 39 participants (mean age 23.2 years, weight 67.4 kg, height 167.4 cm and 22; 56.41% were male). The number of successful intubations in the kneeling and prone position were measured (35;89.7% and 37;94.9%, $P=0.675$), time to perform intubation successfully (23.4 ± 35.7 and 15.9 ± 10.4 , $P=0.222$) and there was no difference in Cormack and Lehane's classification of laryngeal view between the two positions ($P=0.948$).

Conclusion

There was no difference between the prone or kneeling position in treating a patient requiring cervical spine restriction. The prone position may lessen the time required for a patient requiring intubation and this should be considered.

Pre-hospital provider relevance

Pre-hospital providers can perform the successful intubation of a patient in either the prone or kneeling position depending on the scene situation and their own preference. However, when the time factor is critical for trauma patients, the prone position should be considered.

Do training programs improve a paramedic's ability to identify and report child abuse and neglect?

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Introduction

This systematic literature review seeks to establish the extent to which training programs improve a paramedic's competence and confidence when it comes to identifying and reporting child abuse or neglect.

Methods

Selected search terms were entered into eight databases to identify potentially relevant publications. Inclusion and exclusion criteria were applied, and articles were categorised as relevant or irrelevant based on a review of title and abstract, and, when necessary, full text review.

Results

The initial electronic search yielded 872 articles. After the inclusion and exclusion criteria applied, four publications were identified as relevant and included in this systematic literature review. Of these, three were cross-sectional studies and one was a one-group pre-test post-test study. In total, 2,499 subjects were examined across the four articles. Despite the limitations of each study, the results for all four studies were consistent with one another, demonstrating that higher levels of training correlated with greater knowledge and/or confidence regarding both the identification process and the correct procedures for reporting child abuse.

Conclusion

The limited evidence published so far suggests that training improves confidence and ability levels of the paramedic in recognising and reporting child abuse. However, the limitations of these studies needs to be considered before drawing robust conclusions. We call for further research into the topic and suggest that, owing to the complexity of the issue, a qualitative study may be the best way of exploring the variety of barriers to reporting, and the extent to which training would overcome these.

Pre-hospital provider relevance

Paramedics are mandated notifiers in almost all Australian states. Additionally, the Australian paramedics professional body expects competency to 'undertake a comprehensive assessment of the patient, which includes assessment of the psychological, social and cultural determinants of health', therefore this topic should be included in all paramedic training programs.

Paramedic-witnessed paediatric out-of-hospital cardiac arrest in Victoria, Australia

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Introduction

A proportion of paediatric out-of-hospital cardiac arrest (OHCA) are witnessed by paramedics. In this study, we examine the characteristics and survival rates for paramedic-witnessed paediatric OHCA.

Methods

We included paediatric OHCA that were witnessed by paramedics between 2000 and 2016 in the State of Victoria, Australia, from the Victorian Ambulance Cardiac Arrest Registry. Baseline characteristics and survival outcomes are reported using descriptive statistics and stratified by age groups (infant <1 year, children aged 1–11 years and adolescents aged 12–16 years).

Results

A total of 1,339 paediatric OHCA were attended by Ambulance Victoria, of which 101 (7.54%) were paramedic-witnessed. Of those witnessed by paramedics, 96 (95.05%) received an attempted resuscitation by paramedics. The most common presenting arrest rhythm was pulseless electrical activity (PEA) (62.79%), followed by asystole (33.72%) and shockable rhythms (2.35%). The overall survival to hospital discharge rate was 15.38%. Survival rates were greatest in patients that presented with PEA (19.23%) and Asystole (13.79%). There were no survivors if the initial rhythm was shockable. Survival rates were highest in the 12–16 years age group (18.18%), followed by infants <1yrs (14.29%) and children aged between 1–11years (11.90%). Survival to hospital discharge between age groups was not significantly different ($P=0.705$).

Conclusion

Whilst almost 10% of paediatric OHCA are witnessed by paramedics, the incidence of shockable rhythms is very low and most survivors present with PEA.

Management of post-partum haemorrhage in the Timor Leste National Ambulance Service (TLNAS)

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Introduction

Timor Leste has one of the highest maternal death rates in the world at 215 per 100,000 live births. Post-partum haemorrhage (PPH) accounts for 27% of maternal deaths globally. Annually the Timor Leste National Ambulance Service (TLNAS) attends over 20,000 cases, of which 2% are diagnosed with PPH. The objective of this study was to evaluate pre-hospital care of PPH patients transported by the TLNAS.

Methods

A retrospective audit of PPH patients transported by ambulance between May 2015 and May 2017. The inclusion criteria were patients diagnosed with PPH and transported during the study period.

Results

Data from the patient care records (PCR) of 214 TLNAS PPH patients were abstracted using the PPH care evaluation tool. Paramedics diagnosed 211 (97%) PPH patients, took observations on 181 (85%) and obtained a patient history from 193 (90%) patients. Timor Leste National Ambulance Service paramedics did not regularly provide other treatment including oxygen 36 (17%), intravenous isotonic crystalloid fluid 117 (55%), uterine massage 0 (0%), external aortic compression 0 (0%) and non-pneumatic anti shock garments (NASG) 9 (4%).

Conclusion

This research has shown that paramedics are not consistently using available clinical interventions and further work is required to enhance training and the availability of equipment.

Sepsis the silent killer – one that goes unidentified in the pre-hospital setting

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Introduction

Today, sepsis is an expanding commonness in the public eye due to the expansion in chronic health over patient life expectancies. The evaluated overall rate of sepsis, limited to 1979–2015, was 437 for sepsis and 270 for serious sepsis cases per 100,000 person-year.

Methods

PubMed, PMC and Cochrane were sought and information was sourced from within the past 10 years. It's factually critical and considered pertinent and relevant to paramedic practice, as sepsis goes unidentified. Keywords utilised in the search included sepsis, paramedic management, antibiotics, IV-fluids and pre-hospital administration.

Results

Literature articles demonstrate utilising broad-spectrum antibiotics; intravenous fluid treatment and pre-hospital notification give the most critical interventions. The research proposes a solid relationship between postponed antibiotic treatment bringing in-hospital mortality 1.09 (95% CI, 1.05-1.13). The increase in mortality associated with an hour's delay in antibiotic administration was 0.3% (95% CI, 0.01-0.6%; $P = 0.04$) for sepsis and 0.4% (95% CI, 0.1-0.8%; $P = 0.02$) for severe sepsis. Hospital mortality is lower among patients treated with pre-hospital intravenous catheter alone ($P < 0.01$). Intravenous fluid treatment via an intravenous cannulation ($P < 0.01$) has seen a reduction in-hospital patient mortality. Subsequently, receiving sufficient introductory fluids reduces mortality (OR =0.46; 95% CI 0.23, 0.88; $p < 0.001$). The time to administer antibiotics and the source of infection are independently associated with mortality (2).

Conclusion

The most beneficial outcomes to patients are the early administration of medications, being antibiotics and intensive fluid therapy. Early administration of broad-spectrum antibiotics and intravenous fluid therapy decrease in-hospital patient mortality rates, and this is the overall recommendation.

Pre-hospital provider relevance

The early management and identification provided by paramedics can decrease the mortality of patients in the hospital. The early administration of broad-spectrum antibiotics and intravenous fluid therapy provide the most beneficial outcomes to patients and can be easily initiated in the pre-hospital field.

Cleaning the same site with alcohol before performing glucose measurement does not affect the glucose reading

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Introduction

Point-of-care glucometry (POCG) is a diagnostic test performed by paramedics. Standard practice involves cleaning the sample site with alcohol prior to lancing the skin so that any existing foreign surface material will not contaminate the sample. Anecdotally, non-adherence to this practice is common, and guidance regarding the optimal approach is conflicting. This study aimed to determine if a difference in blood glucose level (BGL) reading exists between capillary blood samples taken from sites cleaned with alcohol compared to sites that are not.

Methods

A prospective comparative study was conducted using volunteers who did not clean their hands before participating. A pair of capillary blood samples was taken from each participant: one from a finger cleaned with an alcohol swab and left to dry for 30 seconds before lancing; the other from an uncleaned finger on the same hand. A paired t-test was used to analyse difference, with statistical significance established at $p=0.05$. A difference of 1 mmol/l was deemed a-priori to constitute clinical significance.

Results

Thirty-six participants were recruited, achieving sample size requirements. There was no difference in mean BGL between samples from fingers cleaned before lancing to samples from an uncleaned fingers (mean 5.64 mmol/l (SD 0.7) compared versus 5.60 mmol/l (SD 0.8); $p=0.8$). These findings were also not clinically significant.

Conclusion

Alcohol cleansing of the sample site before lancing did not affect blood glucose reading compared to not cleaning. These data suggest concerns regarding false readings secondary to not cleaning a sample site before performing blood glucose measurement may not be well founded.

Pre-hospital provider relevance

Accurate vital signs inform safe and effective decision making in paramedic practice. These data reduce ambiguity in procedural technique regarding BGL measurement and promote evidence-based practice. The risk of infection presented by sampling from an uncleaned finger was beyond the scope of this project.

A pilot study to reduce falls risk, improve independence and decrease emergency admissions of the elderly

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Introduction

Alfred Health and Ambulance Victoria (AV) partnered to pilot a collaborative falls response care model to reduce falls risk, improve independence and decrease emergency admissions (STRIDE).

Methods

The STRIDE pilot ran from 1 August 2017 to 5 March 2018 within the Alfred Health catchment area. Low acuity falls patients aged ≥ 65 years who could be attended in their home were referred to the service. If accepted, a detailed in-home patient and environment assessment was conducted with recommended interventions and community referrals.

Results

One hundred and twenty referrals were made to the STRIDE service with 104 patients consenting to the evaluation. The median age was 83 years and most patients were female (59%). The majority of patients lived in their own home (74.0%), lived alone (59.6%) and had high polypharmacy (73% taking ≥ 4 prescribed medications). Patients experienced a median of two falls (range 1–26) within the previous 12 months. At baseline, most patients had a moderate to high 'concern' and 'risk' of falling.

Fear of falling improved at 1 month follow-up with a significant increase in patients reporting a low concern of falling. Further, quality of life improved and there was a reduction in problems (EQ-5D) across all dimensions indicating improved health status. Clinicians and referrers perceived STRIDE to be beneficial in meeting a service gap in the community. Patient satisfaction and adherence to the referral, education and treatments provided by the service were high.

Conclusion

Whilst the STRIDE service had a lower number of referrals than anticipated the patients that utilised the service benefited with improved health status and a reduced falls risk. Future consideration could be considered to integrate the service into an existing allied health service model.

Pre-hospital provider relevance

Provide a rapid falls response service to refer and support elderly patients to access the most appropriate care.

Characteristics of emergency ambulance attendances to patients with dementia

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Introduction

The number of people with dementia is steadily increasing and the complexities in managing these patients is well recognised. Emergency medical services (EMS) frequently transport these patients and provide minimal intervention. Furthermore, there is a paucity of literature exploring EMS attendances to dementia patients in the pre-hospital setting. We sought to describe the characteristics of dementia patients presenting to EMS in Victoria, Australia.

Methods

A retrospective observational review was conducted of all dementia patients who were attended by an emergency ambulance between 1 January 2016 and 31 December 2017. Electronic patient care record data were sourced from the Ambulance Victoria data warehouse.

Results

Dementia patients represented almost 5% of the annual emergency workload. The median age of patients was 85 years (IQR 80–90) and most patients were female (57.7%). Almost half of patients (45.2%) were attended in aged care or nursing homes with pain (12.7%) the most common paramedic assessment. Half of those attended (50.5%) received treatment by a paramedic and most patients (85.4%) were transported to hospital. Of all cases, 18.5% of attendances were due to an exacerbation of dementia symptoms of which confusion (45.3%) and psychiatric episode (25.2%) were the most common presentations.

Conclusion

Patients with dementia represent a significant proportion of EMS attendances, with a lack of treatment options and alternative pathways other than transport to the emergency department. Further research is required to help guide pre-hospital triage, treatment and transport decisions.

Pre-hospital provider relevance

To better understand the clinical presentation of dementia patients and assist in providing the most appropriate care and referral pathways.

Self-reported stigma towards people with mental illness: an international, cross-sectional survey of paramedicine students

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Introduction

Stigma towards people with mental illness is common among health professionals, and has been associated with poor patient outcomes. Attempts to de-stigmatise healthcare workers should begin during undergraduate education. The aim of this study was to quantify self-reported stigma levels among an international cohort of first-year paramedicine students.

Methods

A validated survey instrument, the Opening Minds Stigma Scale for Health Care Providers (OMS-HC), was administered to students across four undergraduate paramedicine university programs in Australia, South Africa, Finland and New Zealand. The OMS-HC produces a score from 20–100, with a higher score representing a higher level of stigma. Descriptive data were calculated, and generalised linear models (GLM) with the log link and Poisson family were used to estimate the adjusted odd ratios (OR).

Results

There were 124 respondents, representing a response rate of 56%. The mean self-reported stigma score was 53.1. Finnish students reported the highest total stigma score (61.9), followed by South African (59.5), New Zealand (57.2) and Australian (53.2). Increasing age was associated with increased adjusted odds of reporting higher stigma. Multivariate results revealed students who had no previous diagnosis of mental illness study years (AOR = 0.92, 95%CI: 0.86, 0.98, $p = 0.015$) were less likely to report higher stigma scores compared to those students with a history of mental illness.

Conclusion

These data provide a baseline for self-reported stigma scores not previously reported for student paramedics. Stigma levels differed significantly across international sites, suggesting cultural factors may influence perception of people suffering mental illness.

Pre-hospital provider relevance

Paramedic education has traditionally focused on technical and clinical components while neglecting behavioural and attitudinal domains. These results constitute new knowledge that indicates a need for specifically designed programs aimed at de-stigmatisation during formative years, and provide important data that can inform design of undergraduate paramedicine curricula.

Ambulance clinicians and involuntary care: What influences their decision making process to implement involuntary care and restraint

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Introduction

Mental illness is among one of the leading causes of disability worldwide and becoming increasingly prevalent in the community. The introduction of the South Australian Mental Health Act 2009 gave authorised officers powers based on a set of criteria to place a patient under involuntary care and the use of physical, mechanical or chemical restraint. This original research explores patient circumstances and characteristics that the South Australian Ambulance Service (SAAS) clinicians identify as important and relevant in their decision to use these powers and if scope of practice, years in the service and education have an influence.

Methods

The study used both qualitative and quantitative methods collected through a survey and audit of SAAS Patient Clinical Records around involuntary care. SPSS was used to provide descriptive statistics using univariate analysis to determine the frequencies of responses and bivariate analysis to identify relationships.

Results

Several factors were identified, which played a role in the clinicians' decision-making process. Knowledge, violence and/or aggression, willingness to engage, assessment of direct risk to self, others and property as well as the patients' social and interpersonal factors. There was also a vast difference in the level of detail and documentation between clinicians.

Conclusion

The study successfully identified common features that influences clinicians' decision-making. There were no statistically significant results to identify that scope of practice, years in service and/or education, influenced clinicians' decisions. Further research is required to explore these factors in the pre-hospital setting, as there is very limited research in this area currently.

Pre-hospital provider relevance

The research looks directly at what influences ambulance clinicians' decisions to implement involuntary care and restraint. The prevalence of mental illness is increasing in the community and expanding paramedics' responsibilities. This research helps to better understand clinicians' decision-making in this area and therefore how we can improve their care.

Assessing the effectiveness of infection control prevention in an ambulance environment within the Qatar National Ambulance Service

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Introduction

The study aimed to assess the effectiveness of infection control (IC) prevention in an ambulance environment within the Qatar National Ambulance Service (QNAS), by determining contamination levels as a surrogate measure of the effectiveness of the deep-clean process implemented.

Methods

This study employed a quantitative approach using a longitudinal design to investigate contamination levels and the effectiveness of the deep cleaning procedures. Adenosine Triphosphate (ATP) swab tests were used to determine the level of contamination by measuring relative light units (RLUs) on three high-contact surfaces inside ambulances.

Results

Contamination of three selected high-touch ambulances surfaces viz. console touch screen (\bar{x} =1184.93 RLUs, sd + 2123.869), stretcher handle-D-bar (\bar{x} =901.03 RLUs, sd + 1675.039) and ambulance hand rail (\bar{x} =1605.83, sd + 2052.033), showed extremely high RLU readings (>1000RLUs) at 30 days post-deep cleaning within a subset of 30 operational ambulances. After the standard deep cleaning procedure these results were significantly reduced; console touch screen (\bar{x} = 20.17 RLUs, sd + 22.565), stretcher handle-D-bar (\bar{x} = 23.03 RLUs, sd + 25.902) and ambulance hand rail (\bar{x} =24.23, sd + 27.571); signifying effective decontamination with current processes in place.

Conclusion

Standard 30-day deep clean cycles may be insufficient to maintain a safe environment for staff and patients and should be shortened to at least 15 day intervals to maintain contamination levels below 1000 RLUs. Further education and training may be needed to ensure consistency in cleaning practices.

Pre-hospital provider relevance

The findings of this study are relevant to the pre-hospital provider as they suggest that the high contact points in the ambulances need to be deep-cleaned at 15 day intervals at least. Pre-hospital providers and managers thus need to be cognisant of cleaning ambulances on a regular basis to avoid cross contamination.

Responding to unscheduled urgent and emergency healthcare demand in the UK: A trial of collaborative working between paramedics and fire and rescue service employees

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Introduction

In recent years there has been consideration of encouraging a closer working relationship between the blue light services in the United Kingdom (UK) to meet growing demand on already stretched ambulance services. This study set out to answer the following question: What impact, if any, can firefighters have on the delivery of emergency medical response (eg. co-responding) and wider community interventions (eg. dementia awareness) within communities across the UK?

Methods

This paper focuses on the qualitative component of a mixed-methods study. Twenty-six telephone interviews were undertaken with fire and rescue services participating in the trial across the UK. These were audio-recorded, transcribed verbatim and coded thematically looking for emergent similarities/differences.

Results

Key emergent themes include: communication; triage and dispatch systems; involvement in high versus low acuity 999 calls; training and development; relationships with ambulance services; leadership in clinical settings when working with multi-agency resources; financial considerations; clinical governance issues; value to the community; the way forward.

Conclusion

Fire and rescue services co-responding to time-critical events like cardiac arrest can provide meaningful improvements in patient survival, provided staff are trained and are taking the appropriate action; getting on scene first is not enough by itself. The data indicate strongly that there is support from fire service staff to expand wider work including involvement in lower acuity, unplanned urgent care calls, and that there is potential need from members of the public especially those who may be elderly, isolated and/or vulnerable. However, further research is needed to determine any overall benefits.

Pre-hospital provider relevance

There are global challenges in relation to meeting increasing demands on ambulance services and the effective provision of unscheduled, urgent and emergency healthcare. This study is relevant to the paramedic profession as we must find ways of meeting increased demand whilst ensuring delivery of highest quality healthcare.

The 'rotating' paramedic: a new model of service provision

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Introduction

Health Education England funded a program of work to develop a clinically effective and sustainable work model to maximise the contribution of paramedics rotating through a variety of settings including: front-line ambulance work, general practice, and emergency operation/dispatch centres.

The overall aim is to assess if establishing a rotational model of work for paramedics (with a single employer) in a variety of clinical settings is feasible and desirable.

Methods

This paper focuses on the qualitative component of a mixed-methods study. Thirty individual interviews involving a variety of healthcare professionals, including paramedics, were audio-recorded, transcribed verbatim and coded thematically looking for emergent similarities/differences.

Results

Key emergent themes include: improved continual professional development for paramedics; increased collaborative, interprofessional working; improved job satisfaction and subsequent paramedic retention; challenges to clinical governance; complexities of funding; demand for flexible models of rotational working according to local healthcare demand.

Conclusion

It was evident that there was an appetite for a rotational model both from paramedics and other healthcare professionals. This study reports improved working relationships with greater interprofessional understanding of paramedics' capabilities. Length of rotation in each component is not straightforward. Longer rotations, particularly in primary care support learning and relationship building but shorter rotations increase variety and better support shift rota patterns. Paramedics are keen to continue working within ambulance services but also want to utilise extended skills and expertise in alternative settings. Further research is required to examine longitudinal effects on these areas and to assess impact on patient outcome.

Pre-hospital provider relevance

Similar problems are being reported globally. The rotational model has potential to reverse some of the failings of the past where specialist paramedics in United Kingdom ambulance services were not used to their full potential resulting in them leaving the profession and depleting a workforce that is already in short supply.

The effectiveness of freeze dried plasma in haemorrhagic shock: a systematic review and meta-analysis

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Introduction

Traumatic injury is the leading cause of death in individuals under 45 years of age. Uncontrolled haemorrhage accounts for around 40% of these deaths and is the most common preventable cause of death. Recent military and civilian experience has highlighted the lifesaving benefits of plasma in the resuscitation of bleeding trauma patients. Plasma may be an excellent choice of resuscitative fluid but frozen plasma has significant logistical limitations which make pre-hospital availability extremely difficult. Freeze dried (lyophilised) plasma overcomes these limitations but its comparative effects are largely unknown. The aim was to evaluate the efficacy of lyophilised plasma in the management of haemorrhagic shock. Primary outcomes were mortality and haemodynamics (heart rate and mean arterial pressure (MAP)), while secondary outcomes were serum lactate levels and measures of coagulation (international normalised ratio (INR) and thromboelastography (TEG) parameters).

Method

MEDLINE, Embase, Web of Science and the Cochrane Library were searched to 24 June 2016 using relevant search terms. Experimental and observational studies of humans or animals were eligible provided the subjects were suffering haemorrhagic shock and received at least one unit of lyophilised plasma.

Results

Two human case series of 103 patients and eight experimental studies of 245 swine were included in the review. Lyophilised plasma increased mean arterial pressure, reduced coagulopathy (INR) and improved clot strength (maximum amplitude) yet none of these effects were significantly different to other tested blood products.

Conclusion

Conclusion and relevance: Lyophilised plasma is an exciting innovation that shows promise as a resuscitative fluid for haemorrhagic shock. It may provide the same haemodynamic and haemostatic benefits of frozen plasma without the logistical limitations.

Pre-hospital provider relevance

This has far ranging consequences for pre-hospital clinicians who, as a rule, don't have access to blood products. However, the current evidence is not of sufficient quality to prove non-inferiority and further human trials are warranted.

Validity of MTBI score to predict intracranial haemorrhage in mild traumatic brain injury

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Introduction

Mild traumatic brain injury patients will be sent to have a head computed tomography (CT) scan according to the risk of injury. Moderate and high risk traumatic brain injury (TBI) patients will be considered for transmission for a head CT scan. There is a study to establish a MIBI score by gathering risk scores from high risk and moderate risk groups. The objective was to evaluate the mild traumatic brain injury (MTBI) score to assess the accuracy of predicting intracranial haemorrhage in the mild traumatic brain injury patient who was sent to have a CT scan performed.

Methods

Retrospective cross-sectional study. In 10 hospitals, the patients with a mild TBI were sent to have a head CT scan. The aim was to study risk factors and to calculate points for predicting the MIBI score from patient records. By dividing the injured into two groups, the X-rays of the brain were divided into normal and abnormal. After that, the accuracy of MIBI score was investigated in predicting haemorrhage in a patient's head CT scan.

Results

There were a total numbers of 999 patients, comprising of 461 (46.15%) persons with abnormal brain CT and 538 (53.85%) persons without brain abnormalities. In the low risk group Mild TBI (MIBI score < 3), moderate risk group Mild TBI (MIBI score 3-6) and high risk group (Mild TBI (MIBI score > 6) the likelihood of positive head CT scan was 0.41 3.53 and 77.3 respectively.

Conclusion

MTBI risk score may help to select the mild TBI patients to have a head CT scan especially in a hospital without head CT scan facilities. It is necessary to immediately transfer patients of high risk and moderate risk score of mild TBI to have a head CT scan.

Poster Presentations

Building relationships with indigenous communities to improve health outcomes - National Marae Out of Hospital Cardiac Arrest Project

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Introduction

St John's annual Out of Hospital Cardiac Arrest (OHCA) report, shows that Māori are disproportionately represented in cardiac arrest statistics and are 1.2 times more likely to suffer a cardiac arrest. Since 2015, St John has worked to install Automated External Defibrillators (AEDs) on Marae to reduce the number of fatalities associated with cardiac arrests in the community and improve health equity for Māori.

The OHCA report identifies that Māori have a disproportionately higher incidence of OHCA per 100,000 people per year (106.6) compared with non-Māori (less than 90). Encouragingly, when a public defibrillator is used by bystanders before the arrival of emergency services, patient outcomes improve with 44% of these patients surviving. Given the location of many Marae, early access to cardiopulmonary resuscitation (CPR) and defibrillation is key to improving survival rates among Māori.

Methods

The project aims to increase resilience in Māori communities in dealing with cardiac arrest by improving access to first aid training ('3 Steps for Life' program) and defibrillators and increasing confidence to be able to perform CPR if required.

A key component for success was an effective cultural engagement process. The accuracy and appropriateness of the information being disseminated is essential to support Marae to make robust decisions and to build relationships with Marae.

Results

The total number of Marae who now have AEDs is 69 and over 600 whanau members have completed the training with more Marae coming on board.

Pre-hospital provider relevance

Installing AEDs and delivering first training on Marae, ensures that CPR and defibrillation can occur within the recommended first 4 minutes of a cardiac arrest. Ambulance personnel can then administer early advanced care immediately on arrival, giving a greater chance of survival for Māori.

Development and evaluation of a tool to assess health and resilience in a salutogenic model: The Sense of Coherence, Health and Resilience Assessment (SCHARA) Pilot

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Introduction

This study aimed to develop a tool to allow paramedics, with their unique access to patients in their living environments, to examine individual Sense of Coherence (SOC) and resilience. The Sense of Coherence, Health and Resilience Scale (SCHARA) is designed to help guide health planning and appropriate referral pathways. By assessing SOC and resilience, paramedics may determine patients' capacity to cope with and manage health events as an adjunct to clinical treatment.

Methods

Information was collected from multiple data sources and utilised systematically, with each phase of study building upon the previous. The final phase of development consisted of a pilot study to validate the SCHARA by comparing the results to that of a previously validated tool to measure individual SOC. Both questionnaires were administered to demographically diverse groups to determine whether the scores would vary based on different life circumstances.

Results

Comparing the components of SOC, comprehensibility scores shown 79.17% validity, manageability results shown 91.67% validity and meaningfulness scores were found to have a 91.67% validity when compared to the scores of the SOC-13.

Conclusion

By utilising a multi-factorial approach to determining one's health status and predicating their capacity for adaptive coping, healthcare providers will better be able to assist patients/clients in overcoming health events and build health resilience for improved future health outcomes. Further research is needed to further develop the SCHARA into an electronic application conducive to the pre-hospital environment to address the issue of access to appropriate care services throughout rural and remote regions.

Pre-hospital provider relevance

The SCHARA represents a practical tool to allow paramedics to quickly and easily assess not only current health resilience in acute events, but patient behaviour in future health events or compliance with referrals. This has significant implications for community wellness and addressing frequent users.

Venous versus capillary blood glucose measurement using a capillary-based glucometer: a prospective experimental study

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Introduction

Point-of-care glucometry (POCG) is a core component of physiological assessment performed by paramedics. Point-of-care glucometry is analysed using hand-held glucometers engineered to analyse samples of capillary origin. Anecdotally, venous blood samples taken from intravenous (IV) catheters are frequently used for analysis instead of samples of capillary origin. It has been hypothesised that these may produce different measurements and lead to flawed treatment. This study aimed to compare blood glucose level (BGL) derived from venous samples with those from capillary blood.

Methods

Data were prospectively collected from healthy volunteers. Each participant provided paired samples, consisting of a venous sample taken from a peripheral IV catheter and a capillary sample taken from a finger-tip. Blood glucose level was measured using a POCG designed to analyse capillary-based blood samples. A paired t-test was used to analyse the difference between samples. Statistical and clinical significance were set at $p=0.05$ and 1 mmol/l, respectively.

Results

Thirty-six paired samples were collected, meeting sample size requirements. Fifty-three percent of participants were female (19/36), and the mean age was 26 years (SD 8.3). The mean venous BGL was 5.3 mmol/l (SD 0.6), compared to 5.6 mmol/l (SD 0.8) for the capillary samples. This represented a statistically significant difference of 0.3 mmol/l ($p=0.04$), but did not reach the a-priori established point of clinical significance (1 mmol/l).

Conclusion

This well-powered prospective study suggests venous and capillary blood can be used interchangeably to measure BG when using a point-of-care glucometer designed to measure capillary blood. This finding is useful to paramedics who routinely rely on BGL to help determine physiological status.

Pre-hospital provider relevance

The findings indicate that in situations where a capillary sample is not available, for example a patient with poor peripheral perfusion and slow capillary refill, a venous sample can be used without fear of a misleading measurement, increasing utility of BGL as a measure of physiological status.

Paramedic-initiated helivac to tertiary hospital for primary PCI: A strategy for improving treatment delivery times

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Introduction

Primary percutaneous coronary intervention (PPCI) is well established as the optimal treatment of patients presenting with ST-elevation myocardial infarction (STEMI) in large metropolitan centres. Less clear is the best management of patients presenting in smaller centres without coronary catheterisation laboratory (CCL) facilities. The aim of this study was to trial a new process of paramedic-initiated helivac of STEMI patients from the field directly to the CCL for PPCI, and to examine both the impact on time to treatment and the accuracy of paramedic diagnosis.

Methods

Over a 48-month period, paramedics identified patients with a clinical presentation and electrocardiogram features consistent with STEMI and transported them directly to the regional rescue helicopter base for helivac to the CCL (flight time 30–35 minutes). These patients were compared to a similar historic cohort transported to the local hospital prior to helivac. The main outcome measures were first medical contact-to-balloon (FMCTB) time and accuracy of paramedic diagnosis.

Results

A total of 92 patients underwent helivac for PPCI (mean age of 64 years, SD \pm 10.3). Median FMCTB time was 155 minutes (IQR = 27) for the historic cohort (n = 57), versus 102 minutes (IQR = 16) for the experimental cohort (n = 35), (p = <0.001). Paramedic diagnosis showed a sensitivity of 97% (95% CI 85 to 99) and a specificity of 100% (95% CI 84 to 100).

Conclusion

Paramedic-initiated helivac of STEMI patients from the field directly to the CCL for PPCI is safe and feasible and can significantly improve time to treatment.

Pre-hospital provider relevance

The success of this paramedic pathway has now allowed for routine consideration of PCI as a primary reperfusion strategy in a population of 85,000 whose local receiving hospital is without interventional cardiology services and where distance to the nearest CCL precludes road transfer.

The Pulsara smartphone App streamlines communication between paramedics, hospital emergency and other hospital departments: Preliminary results show improved Ambulance Victoria metrics and treatment times

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Introduction

The time-critical conditions of stroke/STEMI require rapid assessment, diagnosis and treatment involving multiple clinicians. However, communication systems between in-field paramedics and hospital clinicians are fragmented, and rely on various methods and repetition of patient information. This fragmented communication may contribute to delayed processes. The aim of this study is to determine if a smartphone communication app can improve clinical care timelines for patients with suspected acute stroke or STEMI.

Methods

Twelve month pre-post historical-control design. The Pulsara™ Stop Stroke/STEMI smartphone/tablet App (Pulsara) was implemented in 25 Ambulance Victoria [AV] branches and two hospitals in regional Victoria, during 2016/2017. Pulsara provides secure, simultaneous, two-way, real-time communication. Eligible patients had suspected acute stroke and STEMI events assessed by paramedics or hospital clinicians; data collection is ongoing. Preliminary results compare Relevant AV response metrics and care timelines if Pulsara was initiated (Pulsara) or not (no Pulsara).

Results

- 266 patients with stroke (no Pulsara/Pulsara: n=81/n=185 - median 75 years, 52%/48% male)
- Faster paramedic hospital-arrival-to-triage - median 2 minute reduction (p=.002; no Pulsara: 5 minutes [IQR: 3-12]; Pulsara 3 minutes [IQR: 2-6])
- Faster arrival-to-patient-off-stretcher - median 5 minute reduction (p=.001; no Pulsara: 17 minutes [IQR: 10-29]; Pulsara 12 minutes [IQR: 7-18])
- Faster paramedic hospital-arrival-to-departure - median 10 minute reduction (p=.01; no Pulsara: 55 minutes [IQR: 43-64]; Pulsara 45 minutes [IQR: 35-55])
- Patients treated within recommended guideline of 60 minutes from 14% to 25%; p=.29
- Results for STEMI (N=64) will also be presented.

Conclusion

Preliminary results show improved AV and hospital metrics and care timelines for patients with suspected stroke/STEMI.

Pre-hospital provider relevance

Preliminary results show the use of a smartphone app can reduce delays to clinical treatment by streamlining communication between paramedics and multiple hospital departments in real-time. The app provides improvements in security and transparency over traditional methods including providing a case summary to paramedics.

Proactive healthcare via electronic referrals - keeping local communities Safe and Well

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Introduction

St John is working with District Health Boards (DHB), primary health organisations and other health providers across New Zealand to develop formalised, local 'Safe and Well' referral pathways for low acuity patients. These pathways support St John's commitment to provide patients with the right care, at the right time, in the right place.

Ambulance personnel have previously felt powerless to address patients' unmet health needs in the community, and demand for a direct referral process was identified for ambulance patients (and their families and whanau) who are safe to stay at home but require follow up care or support. Examples include falls prevention, needs assessment, smoking cessation, and community clinical review (eg. diabetes, COPD, etc.).

Results

St John designed an electronic referral process that is straightforward for ambulance personnel to use, maximises the capabilities of the electronic patient report form (ePRF), and ensures that patient information is protected when being transferred to the health/service provider. Safe and Well pathways have been well received by ambulance personnel and external stakeholders, as well as the patients who have benefitted from the services they were referred to.

Conclusion

Safe and Well is about proactive and preventative health care that is equitable and closer to home to improve community health and wellbeing. To date, St John ambulance crews have referred over 3,800 patients to local health and social support services via ePRF, and we continue to develop new pathways to meet the needs of local communities.

Pre-hospital provider relevance

Ambulance personnel attend patients at home on an unplanned basis, and although they may recommend that a lower acuity patient see their general practitioner for review, factors such as cost and lack of transport often prevent the patient from complying. Direct referral pathways ensure the patient receives the support they need.

The underpinnings of paramedic identity: a philosophical exploration

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Introduction

As paramedicine increasingly professionalises, this has implications for professional identity, which is at the core of any profession. Many frameworks exist for defining a profession, often based on characteristics of an occupational group. However, deeper than a collection of characteristics is how members of that profession self-conceptualise.

Successive philosophers have discussed being and identity. Understanding identity requires understanding of both the objective world and how the individual perceives and interacts in that world. The existential philosopher Sartre considers identity in terms of 'facticity' and 'transcendence'. Facticity are the objective facts around us including environment, language, occupation, etc. Transcendence describes how an individual surpasses these facts of existence and interacts with the world subjectively. Heidegger describes how this is a constant process of self-reference.

Results

Being a paramedic is more than being employed in an occupation. It involves a unique worldview which allows one to view the world in a uniquely paramedic way and go about existing in the world, including providing care, in a uniquely paramedic way. This unique paramedic view underpins paramedic practice through metaparadigm, that is an approach to practice which is unique and individual to how paramedics see their role in healthcare and how they engage with that role.

Conclusion

As paramedicine develops, it will need to form underpinning theories that explain its practice. These are intrinsically linked to theories of identity. While paramedics have traditionally viewed their identity through their occupation or function, identity and being as a paramedic is a much deeper concept.

Pre-hospital provider relevance

As paramedicine develops, the more important it is to understand the profession and its members at a fundamental level. This explains how paramedics engage with elements such as self-regulation, professional values and relationships to patients and the community as well as underpinning culture, role, wellness and the paramedic worldview.

Impact of acute fatigue induced by sustained wakefulness on cognitive performance

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Introduction

Shiftwork can subject paramedics to acute fatigue that has the potential to negatively affect cognitive function and, subsequently, clinical reasoning. Nightshifts result in periods of sustained wakefulness, and represent an environment in which paramedics may be particularly vulnerable. This feasibility study aimed to investigate the impact of a 12-hour simulated nightshift on cognitive performance.

Methods

This prospective experimental study investigated student paramedic volunteers who undertook a prolonged period of sustained wakefulness by completing a 12-hour simulated 'nightshift' from 1900 until 0700. At five pre-determined time-points (1900; 2200; 0100; 0400; 0700), participants completed two measures of cognitive performance: a 'psychovigilance test' measuring attention and reaction, and the 'Wisconsin Card Sorting Test' measuring executive function. Multilevel Poisson regression that adjusts for confounders by time interaction as covariates was used to produce relative risks (RR).

Results

Seventeen participants completed the 12-hour shift. Fifty-three percent were male, with a mean age of 25 years. There were no significant temporal differences across the five time-points for the primary outcome of psychovigilance (adjusted RR 5.73, 5.75, 5.66, 5.67, and 5.7 for 1900, 2200, 0100, 0400 and 0700, respectively), or for the secondary outcome of executive function (adjusted RR 2.31, 2.36, 2.24, 2.10 and 2.40).

Conclusion

In this exploratory study, cognitive performance did not demonstrate a significant change across the duration of the nightshift. These results provide important data that increase understanding of the impacts of acute fatigue on cognitive performance, and how this may affect paramedic reasoning and cognition in a shift-based clinical environment.

Pre-hospital provider relevance

Little evidence exists from prospective research describing the impact of acute fatigue in the context of paramedicine. These results are counter-intuitive to what might be expected, and should serve to stimulate discussion and further research exploring cognitive performance during nightshifts. The findings may challenge perceptions held by frontline paramedics.

Paramedic learning and reflections: a pilot project using simulation to evaluate student interdisciplinary handover

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Introduction

Loss of information during multiple interdisciplinary handovers is a recognised phenomenon. This project sought to measure handover accuracy and compare this to student perception of handover effectiveness.

Methods

A mixed method crossover design was used to evaluate handovers in multidisciplinary teams of student paramedics, nurses and doctors. Recorded scenarios (video) were inbound: paramedic to nurse; nurse to doctor; doctor to consultant and outbound: doctor to nurse, nurse to paramedic and paramedic to senior paramedic. Each handover video was scored for accuracy of information transfer. Students provided reflective responses on personal handover effectiveness and perceived data points transferred.

Results

Of 18 handovers (nine inbound, nine outbound) inbound handover accuracy was: paramedics 80%, nurses 64%, doctors 50% and outbound accuracy: paramedics 63%, nurse 60%, doctors 61%. Categorisation of handover aspects showed that 'additional background' and 'response to treatment' was poorly conveyed. Conversely, demographics, clinical impression and treatment were most transferred. Handover accuracy was better in paramedics to nurse than doctors to nurse ($p < 0.05$). Students' perceptions between clinical data handover (13.83 ± 19.6) and non-clinical (-36.5 ± 26.04) were significantly different $P < 0.05$. Student perceptions of effective handovers indicated written notes, systematic approach and clarification can improve handover accuracy.

Conclusion

There is a significant amount of critical patient information being lost during subsequent handovers (more than one). This includes a discrepancy between perceived and actual information transferred. A concerted effort needs to be made to improve student handover knowledge, understanding and skill.

Pre-hospital provider relevance

Handovers are the 'gold standard' for the delivery of patient information from the pre-hospital to hospital environment. If critical patient information is being lost between these two environments, patients are at risk. Enhanced education is required to ensure students have proficient knowledge and skills in handovers.