

PARAMEDICINE ACROSS CANADA EXPO    PARAMÉDECINE AU CANADA EXPO

# PACE2019

Paramedic Research Symposium  
19 September, Winnipeg, MB

# Book of Abstracts



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## Welcome!

Welcome to the inaugural Paramedic Research Symposium, held at Paramedicine Across Canada Expo 2019, in Winnipeg, Manitoba, September 19th, 2019.

First, we would like to thank all of you for your participation at the symposium. We are aware that many of you have travelled a long way to be here with us today. We have attendees, and presenters from all across Canada, Australia, New Zealand, the UK, the USA and more. Thank you!

We are proud to present an outstanding scientific program, reporting developments in the field of paramedicine in the form of two internationally renowned guest speakers, Dr. Walter Tavares and Dr. Alexander MacQuarrie. In addition, the conference will host a series of oral presentations, and a moderated poster session where researchers in paramedicine will be able to present their recent research.

The afternoon sessions will play host to a series of “round-robin” tables, where attendees will have the opportunity to network with experienced researchers in the field, and gain invaluable insight and knowledge in relation to starting their own research journeys. In addition, these sessions will offer advice on all aspects of the research process, from conceiving an idea through to publication and dissemination.

All of this has been possible thanks to your participation, to our sponsors support and to our helpers involvement.

We do hope that you enjoy your attendance at the Paramedic Research Symposium!

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Cheryl Cameron  
Alan Batt

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## Agenda

<b>0815-0900</b>	<b>Registration, poster setup and viewing</b>	
0900-0930	Opening plenary	Dr. Walter Tavares
<b>0930-1030</b>	<b>Oral presentations 1</b>	
0930-0940	Nicola Little	Sex and gender equity in prehospital ACS care
0940-0950	Justin Hunter	What is situational awareness and how has it been researched in paramedicine?
0950-1000	Dr. Elizabeth Asbury	The psychological health and wellbeing of New Zealand ambulance service personnel
1000-1010	Paul Younger	A service evaluation of a dedicated pre-hospital cardiac arrest response unit in the North East of England
1010-1020	Dr. Judah Goldstein	Evaluating paramedic comfort, confidence, and cultural competency in providing care to trans populations in a provincial ambulance system
1020-1030	Joanna Lockhart	Helping Those Who Help Us: Personality, Stress, Coping and Social Support in Nova Scotia Paramedics
<b>1030-1100</b>	<b>Break</b>	
<b>1100-1200</b>	<b>Oral presentations 2</b>	
1100-1110	Justin Mausz	Unpacking the Sociocultural Characteristics of Paramedic Mental Health: a Grounded Theory Study
1110-1120	Zach Cantor	Utilization and Outcomes of Children Presenting to an Emergency Department by Ambulance
1120-1130	Buck Reed	Perceptions of Self Regulation by Australian Paramedics
1130-1140	Polly Ford-Jones	Addressing patient mental health needs in the prehospital setting: An overview of challenges and future directions in practice. A case study of Ontario
1140-1150	Dr. Walter Tavares	Agency and Affordances: Exploring the Integration of a Novel Continuing Education Strategy in Paramedicine
<b>1150-1300</b>	<b>Lunch, poster viewing</b>	
1300-1330	Moderated poster viewing	
1330-1430	Round robins Rotation 1	
<b>1430-1500</b>	<b>Break</b>	
1500-1600	Round robins Rotation 2	
1600-1630	Closing plenary	Dr. Alexander (Sandy) MacQuarrie
1630-1645	Closing remarks	

**Oral Presentation Abstracts**

## **A26: Sex and gender equity in prehospital ACS care**

Presenting author: Nicola Little\*

\*Winnipeg Fire Paramedic Service, [nmcdonald@winnipeg.ca](mailto:nmcdonald@winnipeg.ca)

Other authors: Neil McDonald, Erin Weldon, Rob Grierson

### **Abstract**

**Introduction:** Recent research in cardiac care has identified significant sex- and gender-based differences across many outcomes. Our EMS agency recently addressed sex-based differences in assessment through protocol changes and in-service training. This study aims to investigate the effect of these interventions.

**Methods:** We performed a retrospective database review including all patients who met broad criteria for cardiac assessment. Primary outcomes were rates of 12-lead acquisition, grouped by dispatch determinant and divided by patient sex. Data collection started in January 2017 and is ongoing. 12-lead acquisitions were analyzed by sex (comparison of two proportions) before and after the protocol change (up to October 2018). Further analysis (available in June 2019) is tracking the primary outcomes through process-control charts on a monthly basis.

**Results:** At baseline, women showed a lower rate of 12-lead acquisition compared to men across all complaints. After protocol changes, the differences between women and men (shown as women – men) in selected complaints remained significant for chest pain (-6.7, 95%CI: -1.6,-11.7, p=0.01) and shortness of breath (-10.0, 95%CI: -3.2,-16.7, p=0.004), but not for syncope: (-1.0, 95%CI: -7.0,9.0, p=0.81).

**Conclusion:** Baseline rates of 12-lead acquisition in one urban EMS agency appear to be lower in women than men. After protocol revisions aimed at reducing these differences, these rates show minor changes. Ongoing analysis will examine the long-term effect of these interventions.

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## **A05: What is situational awareness and how has it been researched in paramedicine?**

Presenting author: Justin Hunter\*

\*Oklahoma State University - OKC, Monash University, *justin.hunter@okstate.edu*

Other authors:

### Abstract

**Background:** Situational awareness (SA) has been identified in high-dynamic systems as an important factor in preventing error. Paramedicine is a high-dynamic profession where safety & medical errors occur. Very little empirical data exists for paramedicine and SA.

**Methods:** To review, synthesize, and map the breadth of knowledge available between paramedicine and SA. A detailed search of electronic databases and grey literature was used to identify empirical data related to paramedicine and SA.

**Results:** Utilizing both SA and paramedicine as concepts, 1,126 papers were identified which yielded 21 papers for qualitative synthesis, after screening. These 21 papers do reveal that SA can be measured and may have a place in paramedicine, although there does not appear to be much empirical understanding of paramedicine and SA.

**Conclusion:** To be situationally aware, a person must be able to perceive an event, comprehend what that event means, and then project how that information is going to affect future events. SA, in this full framework, has not been researched in depth in paramedicine. Most papers only focus on perception as being the core component of SA. Further research is needed in order to explore several knowledge gaps that were identified including potential effects of possessing, or not possessing SA, as well as how educational standards and best practices related to SA might be improved.

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## **A08: The psychological health and wellbeing of New Zealand ambulance service personnel**

Presenting author: Elizabeth A. Asbury\*

\*Whitireia New Zealand, [Elizabeth.asbury@whitireia.ac.nz](mailto:Elizabeth.asbury@whitireia.ac.nz)

Other authors: Mitch Mullooly

### Abstract

**Introduction:** New Zealand has numerous government funded, charity and privately run ambulance services, which are increasingly crossing over into services traditionally provided by primary care. Roles include patient transport, community medicine, telephone triage and mental health services. While paramedic mental health has gained attention in recent years, few studies have explored the psychological health and wellbeing across the New Zealand ambulance sector as a whole.

**Method:** New Zealand ambulance sector personnel who are members of Paramedics Australasia New Zealand (PANZ) or 'Fit for duty, Fit for life' social media sites are being invited to participate. Both members-only groups are aimed at ambulance sector workers and have a combined total of 5200 members. Participants will complete the following questionnaires: Davidson Trauma Scale, MOS Social Support Scale, Job Satisfaction Survey, Hospital Anxiety and Depression Scale, Maslach Burnout Inventory, Beck Hopelessness Scale and Connor-Davidson Resilience Scale along with demographic and occupational information.

**Results:** Data collection began in January 2019. Data will represent the results from the complete cohort, including the incidence of psychological morbidity among each occupational group, with cross-sectional analysis highlighting differences between groups. Further analysis will explore the impact of practice in urban, rural or remote locations, and will explore behavioural choices linked with psychological wellbeing.

**Conclusion:** Previous studies have explored various professions within the ambulance service in isolation. This study will inform the international ambulance community of the burden faced by New Zealand ambulance service personnel, and may provide evidence for improved working practices and targeted intervention.

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## **A22: A service evaluation of a dedicated pre-hospital cardiac arrest response unit in the North East of England**

Presenting author: Paul Younger\*

\*North East Ambulance Service NHS Foundation Trust, [paul.younger@collegeofparamedics.co.uk](mailto:paul.younger@collegeofparamedics.co.uk)

Other authors: Graham McClelland, Daniel Haworth, Amy Gospel, Paul Aitken-Fell

### Abstract

**Aim:** This study describes the introduction of a specialist cardiac arrest response unit by the North East Ambulance Service NHS Foundation Trust, with the aim of improving treatment and outcomes of out-of-hospital cardiac arrest patients, in the North East of England.

**Methods:** This study is a retrospective analysis of prospectively collected data, describing all cases where the cardiac arrest response unit was dispatched in the first 12 months of operation (January 2014 to January 2015).

**Results:** The cardiac arrest response unit was activated 333 times during the first year of operation and attended 164 out-of-hospital cardiac arrest patients. The cardiac arrest response unit demonstrated a significant impact on return of spontaneous circulation sustained to hospital (OR 1.74 (95% CI 1.19–2.54),  $p = 0.004$ ) and survival to discharge (OR 2.08 (95% CI 1.12–3.84),  $p = 0.017$ ) compared with the rest of the North East Ambulance Service NHS Foundation Trust.

**Conclusion:** The cardiac arrest response unit project demonstrated an improvement in return of spontaneous circulation and survival to discharge compared to current standard care. The specific mechanism, or mechanisms, by which the cardiac arrest response unit influences patient outcomes remain to be determined.

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### **A13: Evaluating paramedic comfort, confidence, and cultural competency in providing care to trans populations in a provincial ambulance system**

Presenting author: Judah Goldstein\*

\*Emergency Health Services Nova Scotia, [judah.goldstein@emci.ca](mailto:judah.goldstein@emci.ca)

Other authors: Lyon Kengis, Kim McIver, Robin Urquhart

#### **Abstract**

Background: Close to 2 million transgender (trans) individuals live in North America. Our objective was to explore paramedic comfort, confidence, and cultural competency in providing emergency care to trans individuals. Methods: A cross-sectional, semi-structured electronic survey (approved by the NSHA REB) was administered by email to paramedics registered with the College of Paramedics of Nova Scotia (n=1225) from April 9th to May 7th, 2018. A 4-point Likert scale and qualitative open-ended questions were included. Open ended questions were coded using constant comparative analyses to identify themes and descriptive statistics to describe respondent characteristics. Results: Of the 387 paramedics who participated (response rate = 32%), 77.8% (n=301) worked ground ambulance in a mixed rural/urban location (32.6%, n=126) within Nova Scotia. Most respondents were between the ages of 41-50 (29.5%; n=114), with > 20 years' experience (25.1%; n= 97), and male sex assigned at birth (56.1%; n=217). The majority (66.1%; n=256) reported caring for a patient who identified as trans. Many (74.7%; n=289) reported no formal education on trans health. Only 4.1% (n=16) felt very knowledgeable about providing optimal care and paramedics (41.9%; n=162) reported observing transphobia in the work place. Conclusion: Although comfort and knowledge are relatively low and transphobia witnessed in the work place relatively high, there was strong interest and expressed need for education on trans related health.

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## **A14: Helping Those Who Help Us: Personality, Stress, Coping and Social Support in Nova Scotia Paramedics**

Presenting author: Joanna Lockhart\*

\*Emergency Health Services Nova Scotia, [joanna.lockhart@emci.ca](mailto:joanna.lockhart@emci.ca)

Other authors:

### **Abstract**

**Background:** Support services and psychological interventions for paramedics are largely adopted from other occupational groups, assuming shared work experiences and psychological states on stress-relevant constructs. Mental health problems faced by paramedics necessitate research focused on personality, coping, stress and social support to develop the most efficacious support services to ameliorate stress reactions. This research was approved by the NSHA REB.

**Purpose:** Collect descriptive data on these psychological constructs, examine currently available support services and investigate which of the assessed variables predict perceived stress.

**Methods:** An internet-based survey was distributed to 1,348 paramedics in the province of Nova Scotia. The survey included a Big-Five measure of personality and indices of social support, coping and perceived stress.

**Results:** Paramedics were higher in Conscientiousness, Extraversion and Agreeableness and lower in Open-Mindedness and Negative Emotionality (all  $p < .001$ ). Greater perceived stress ( $p < .001$ ) and utilization of healthy ( $p < .001$ ) and less-than-optimal ( $p < .001$ ) coping strategies were reported. Strikingly low perceptions of social support were observed ( $p < .001$ ). Negative Emotionality was the strongest personality predictor of perceived stress ( $R^2 = .438$ ) and Less-Useful Coping and perceptions of social support ( $R^2 = .383$ ) were the top non-personality predictors. Response rate was 26%.

**Conclusion:** Paramedics experience inordinately high levels of stress with a predisposed state of considerable psychological resiliency. The relationship between social support and perceived stress, against the backdrop of lower than normative perceptions of support overall, are the findings of greatest concern.

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## **A18: Unpacking the Sociocultural Characteristics of Paramedic Mental Health: a Grounded Theory Study**

Presenting author: Justin Mausz\*

\*McMaster University, Department of Health Research Methods, Evidence, and Impact,  
*mauszje@mcmaster.ca*

Other authors: Elizabeth Donnelly, Sandra Moll, Meghan McConnell

### Abstract

**Introduction:** The mental health of Canada's paramedics has been brought to the forefront recently, in part due to the growing public awareness of operational stress injury (OSI) and suicide among first responders. The challenge, however, is that while efforts to understand the causes and scope of the problem have increased in recent years, the research suffers from methodological limitations that cloud its interpretation, and has been largely devoid of any attempt to explore the sociocultural characteristics of paramedicine and how these features influence mental health.

**Methods:** Drawing on theories of role identity and gender, we are undertaking a constructivist grounded theory study to qualitatively unpack the social and cultural issues underpinning paramedic mental health and wellbeing. Using a two-stage, semi-structured interview approach, our research questions explore what it means to be a paramedic and how this conceptualization of identity influences coping strategies, help-seeking, stigma, issues of gender, and the experience of work-related mental illness among a purposively selected sample of paramedics in a single urban service in Ontario.

**Results:** Our study is ongoing and we will present our findings at the conference. Given the broad scope of our study and the relative lack of previous similar work, we anticipate enrolling a sample of between 40 and 60 paramedics.

**Discussion and Conclusion:** We will discuss the implications of understanding the social and cultural context of paramedic mental health in enhancing awareness, combating stigma, facilitating access to support, and next steps for researchers.

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## **A19: Utilization and Outcomes of Children Presenting to an Emergency Department by Ambulance**

Presenting author: Zach Cantor\*

\*Children's Hospital of Eastern Ontario; Ottawa Paramedic Service, [zachcantor@gmail.com](mailto:zachcantor@gmail.com)

Other authors: Mary Aglipay, Amy Plint

### **Abstract**

**Introduction:** Children account for a low proportion of paramedic transports. Evidence suggests that many paediatric transports are of low acuity, but few studies compare these patients to those that self-present to the ED. Our primary objective was to determine the illness severity associated with presentation by ambulance among paediatric patients.

**Methods:** We undertook a single centre, retrospective cohort study at a tertiary care paediatric centre. All patients presenting to the ED in 2015 were divided into two groups based on the route of presentation – land ambulance or self-presentation. The primary outcome was disposition decision; the secondary outcome was CTAS level.

**Results:** Of all visits, 6.5% (4478) arrived by ambulance, 93.5% (64,556) self-presented. Two percent of the ambulance cohort were admitted to the ICU (vs. 0.2%), 16.6% were admitted to the ward (vs. 5%). Patients presenting by ambulance had higher CTAS scores – 21.7% CTAS 1-2 (vs. 7.3%), 78.3% CTAS 3-5 (vs. 92.7%). The odds of arriving by ambulance were 10.2 x higher for patients admitted to the ICU (OR=10.2, 95%CI: 7.9 to 13.3) vs. those discharged home; the odds of arriving by ambulance were 64.2 x (OR=64.2, 95% CI: 48.6 to 84.7) higher for patients CTAS 1 patients vs. CTAS 5 patients.

**Conclusion:** Children presenting to the ED via ambulance are at higher risk for admission to the ward and ICU. Given the low proportion but higher severity of illness of pediatric transports, further research and consideration must be given to how best to enable paramedics in the management of children.

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### **A31: Perceptions of Self Regulation by Australian Paramedics**

Presenting author: Buck Reed\*

\*Western Sydney University, [b.reed@westernsydney.edu.au](mailto:b.reed@westernsydney.edu.au)

Other authors: Ian Wilson, Leanne Cowin, Peter O'Meara

#### Abstract

**Introduction/Background:** In December 2018, Paramedics became a self-regulated profession in Australia under the National Registration and Accreditation Scheme (NRAS) for health professionals. This was a significant event for paramedics as the profession was previously unregulated. This study explores perceptions of this process by paramedics. Ethics was granted by the University of Wollongong Human Research Ethics Committee.

**Methods:** A survey was distributed via social media targeting the estimated 14600 paramedics in Australia. 422 responses were obtained representing 2.9% of the paramedic workforce. The survey asked 23 questions about paramedics' knowledge and perceptions of registration as well as 12 demographic questions. Five questions elicited qualitative responses which were thematically analysed.

**Results/Findings:** Paramedics had mixed perceptions of the value of registration and a significant number did not appear to understand the details of new regulatory arrangements. While the majority of paramedics (59%) were in favour of registration many considered there to be significant drawbacks or did not appear to understand the purpose of regulation. Eight percent of respondents reported negative mental health impacts from the process of registration.

**Discussion & Conclusion:** Self-regulation has long been seen as desirable for paramedics. However, this appears at odds with the feelings of a significant proportion of the workforce. This response is likely influenced by cultural, industrial and educational factors. The outcome of this study suggests the majority of practitioners are prepared for or accept the new regulatory regime but more research is needed to understand the complex relationship between regulation and practitioners.

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## **A32: Addressing patient mental health needs in the prehospital setting: An overview of challenges and future directions in practice. A case study of Ontario**

Presenting author: Polly Ford-Jones\*

\*York University, [pollyfj@yorku.ca](mailto:pollyfj@yorku.ca)

Other authors:

### Abstract

**Background:** Paramedics play a crucial role as first point of contact for individuals with mental health needs. The academic and grey literature indicate a rise in call volume to paramedic services for mental health calls. While it is clear that paramedics play a significant role in mental health care for many, the ways in which their practice is guided and carried out has been unclear. A case study of prehospital mental health care in Ontario was conducted with paramedic services across Ontario to explore these areas of inquiry with research ethics obtained by York University's Office of Research Ethics.

**Methods:** This case study (September 2017-October 2018) involved observation in 3 paramedic services in Ontario; interviews with front-line paramedics, management, educators and Base Hospital physicians or directors across Ontario (n=44); and document analysis of training and practice guidelines.

**Findings:** Guidelines for mental health care provided by paramedics remain limited. Paramedics often learn to manage these calls through "on the road" experience, however indicate they could benefit from further guidance and resources. A small number of paramedic services have implemented specific programs to address calls for mental health needs.

**Discussion:** Challenges for care provision by paramedics include limited on scene resources, education, and the emergency department as a destination for those with mental health needs. Further guidelines and education may prove beneficial for paramedics addressing mental health needs in the community. Promising practices are developing in some services to improve management of mental health needs and quality care for individuals in distress.

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### **A36: Agency and Affordances: Exploring the Integration of a Novel Continuing Education Strategy in Paramedicine**

Presenting author: Walter Tavares\*

\*The Wilson Centre and Post-MD Education, Faculty of Medicine, University of Toronto, Toronto; Paramedic and Senior Services Community Health Services Department, The Regional Municipality of York, Ontario, Canada

Other authors: Manpreet Saini

#### Abstract

**Introduction:** A challenge for paramedicine involves the maintenance of competence. Continuing education (CE) programs intended to mitigate the problem are often extrinsically motivated and standardized, potentially limiting effectiveness. We asked whether a novel CE model that is paramedic-initiated, individualized, unstructured, practice based and stripped of formal extrinsic motivators would be adopted by paramedics as a maintenance of competence strategy and why/why not.

**Methods:** Convergent parallel mixed methods design involving: (1) an observational study of paramedic utilization of the CE program; (2) semi-structured interviews with users and non-users. We explored utilization (in different forms), repeat use, amount/type of activities and educational needs. Interview data was explored using inductive thematic analysis. We then merged the two strands of data to explore and interpret findings informing our study objective.

**Results:** Over 16 months, 718 unique interactions were documented across 348 of 518 (67.4%) paramedics - 223 (43.1%) were repeat users. The majority of interactions were clinically oriented (n=650; 90.5%), with the remainder labelled as professional development (n=23; 3.2%) or both (n=45; 6.3%). All interactions were initiated by paramedics. A total of 1273 individual educational interventions were employed. Twenty-seven interviews were conducted, (22 frontline paramedics; 18 users, 4 non-users; 5 managers/supervisors). Facilitators included: neutral peer-based support, credibility, autonomous, personalized and workplace based. Hinderances included: perceived lack of system-level value, potential risk to image, a dynamic environment, a lack of familiarity with the program.

**Conclusion:** Given agency and affordances, paramedics engage in self-initiated, individualized and unstructured CE as a maintenance of competence strategy, even when no formal extrinsic motivators exist.

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**Poster Presentation Abstracts**

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## **A01: Long Term Learning Outcomes of High Fidelity Simulation in Paramedic Education**

Presenting author: Ryley Bennett\*

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Other authors:

### Abstract

High fidelity (HF) medical simulation has long been evolving to play a key role in medical education across the spectrum of healthcare specialties. However, the effects on learning outcomes of this educational modality have been inadequately studied in the emergency medical services (EMS). The aim of this paper is to bring together what research is available from EMS fields, with studies performed in the nursing, and medical professions to draw conclusions on the effectiveness of this developing educational technique. The primary research outcome assessed herein is based on the following question: "Would knowledge integration, confidence in practice, and skill retention improve for graduate paramedic students through frequent implementation of HF simulation training in paramedicine educational programs?". To answer this question, several research methods were used. These ranged from analysis of quantitative randomized control trials assessing low fidelity simulation learning outcomes against those from HF simulation, to capturing the qualitative perceptions of students undergoing HF simulation for the first time. Participants in this literature review included nursing students, registered practitioners in nursing, paramedicine, and medicine. Results of this literature review indicate that HF simulation yields improved short and long-term learning outcomes, confidence in practice, and skill performance. In conclusion, educational institutions should begin to shift focus towards increased integration of HF simulation into daily teaching practices. Further research must be performed to isolate the factors causing HF simulation to quantitatively improve skill and knowledge retention.

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## **A02: Human Factors & Ergonomic Design of Paramedic Response Bags for Patient & Paramedic Safety**

Presenting author: Scott D. Ramey\*

\*British Columbia Emergency Health Services, Medicine Hat College, Northumberland Paramedics,  
*scott@scottramey.ca*

Other authors: Yuval Bitan, Paul Milgram

### **Abstract**

A two phase project is described for redesigning paramedic response bags, one of the key pieces of equipment used by emergency medical services. Adopting a user-centred approach, Phase I involved first educating active service paramedics about ergonomic and human factors principles, and then collaborating with them towards the conceptualising of a new type of response bag. Phase II describes a formal evaluation study conducted in partnership between the paramedic service, vendor and University of Toronto (ethics approval), involving simulated procedures with patient simulation mannequins and active paramedics in a simulated scene and real ambulance. Results indicated subjective preferences for the new bags, as well as the apparent absence of any detrimental effects due to the transition to the new equipment. The hypothesis of reduced medical errors was not immediately apparent through simulation analysis. Also discussed are the advantages of the participatory design approach, as well as some of the implications of the new design for paramedic operations.

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### **A03: Prehospital Opioid Administration to Acute Myocardial Infarction Patients**

Presenting author: Jennifer Greene\*

\*Dalhousie University, [j.greene@dal.ca](mailto:j.greene@dal.ca)

Other authors: Craig Ainsworth, Laurie Lambert, Graham Wong, Warren Cantor, Michelle Welsford

#### **Abstract**

**Introduction:** Opioids are routinely administered for analgesia to prehospital patients experiencing chest discomfort from acute myocardial infarction (AMI). We conducted a systematic review to determine if opioid administration impacts patient outcomes.

**Methods:** We conducted a systematic for relevant randomized controlled trials and observational studies comparing opioid administration in AMI patients. The outcomes of interest were: all-cause short-term mortality (<30 days), major adverse cardiac events (MACE), platelet activity and aggregation, immediate adverse events, infarct size, and analgesia.

**Results:** Our search yielded 3001 citations of which 19 studies were reviewed as full texts and a total of 9 studies were included in the analysis. The studies predominantly reported on morphine as the opioid. Five studies reported on mortality (<30 days), seven on MACE, four on platelet activity and aggregation, two on immediate adverse events, two on infarct size and none on analgesic effect. We found low quality evidence suggesting no benefit or harm in terms of mortality or MACE. However, low quality evidence indicates that opioids increase infarct size. Low-quality evidence also shows reduced serum P2Y12 (eg: clopidogrel and ticagrelor) active metabolite levels and increased platelet reactivity in the first several hours post administration following an increase in vomiting.

**Conclusion:** We find low and very low quality evidence that the administration of opioids in STEMI may be adversely related to vomiting and some surrogate outcomes including increased infarct size, reduced serum P2Y12 levels, and increased platelet activity. We found no clear benefit or harm on patient-oriented clinical outcomes including mortality.

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## **A04: Prehospital Oxygen Administration to Suspected Acute Myocardial Infarction Patients**

Presenting author: Jennifer Greene\*

\*Dalhousie University, [j.greene@dal.ca](mailto:j.greene@dal.ca)

Other authors: Michelle Welsford, Craig Ainsworth, Laurie Lambert, Graham Wong, Warren Cantor

### Abstract

**Introduction:** Oxygen is commonly administered to prehospital patients presenting with acute myocardial infarction (AMI). We conducted a systematic review to determine if oxygen administration impacts patient outcomes.

**Methods:** We conducted a systematic search for relevant randomized controlled trials and observational studies comparing oxygen administration and no oxygen administration. The outcomes of interest were: mortality (?30 days, in-hospital, and intermediate 2-11 months), infarct size, and major adverse cardiac events (MACE). Risk of Bias assessments were performed and GRADE methodology was employed to assess quality and overall confidence in the effect estimate.

**Results:** Our search yielded 1192 citations of which 48 studies were reviewed as full texts and a total of 8 studies were included in the analysis. All evidence was considered low or very low quality. Five studies reported on mortality, and low quality evidence demonstrated no benefit or harm from supplemental oxygen administration. Similarly, no benefit or harm was found in MACE or infarct size (very low quality). Normoxia was defined as oxygen saturation measured via pulse oximetry at ? 90% in one recent study and ? 94 % in another. Meta-analysis still in progress.

**Conclusion:** We found low and very low quality evidence that the administration of supplemental oxygen to normoxic patients experiencing AMI, provides no clear harm nor benefit for mortality or MACE. The evidence on infarct size was inconsistent and warrants further prospective examination. Given the lack of benefit and the potential for harm, routine administration of oxygen to AMI patients is not supported.

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## **A06: Identifying a theoretical framework for situational awareness in paramedicine.**

Presenting author: Justin Hunter\*

\*Oklahoma State University - OKC, Monash University, *justin.hunter@okstate.edu*

Other authors:

### Abstract

**Background:** Theory helps to guide research in the field of paramedicine leading to theory being used to guide practice. Situational awareness (SA) has been heavily researched in high-dynamic systems such as space flight, military special operations, off-shore oil drilling, nuclear energy, and commercial aviation. Paramedicine, also a high-dynamic system, lacks any form of empirical research related to the identification of a suitable theoretical framework for SA.

**Methods:** Compare and discuss the most broadly accepted theoretical frameworks for SA in other high dynamic systems in order to determine which framework(s) would be most appropriately applied to paramedicine.

**Results:** For individual SA, seven theoretical frameworks were identified. Of those seven, three of them have been applied to some form of high-dynamic system. 1) Bedny & Meister's theory of activity model, 2) Smith & Handcock's Perceptual Cycle Model, and Mica Endsley's Three-level model.

**Conclusion:** Mica Endsley's three-level model of SA has been successfully applied to many other high-dynamic systems. Endsley's model also allows for the process of SA and the product of SA to be separate from each other. This separation allows for a paramedic to be situationally aware, regardless of the outcome of the situation. For these reasons, Endsley's three-level model of SA is the most appropriate model to be applied to paramedicine.

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## **A07: Mapping the Success Route for Indigenous Paramedic Students at Saskatchewan Polytechnic**

Presenting author: Lindsey Boechler\*

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Other authors:

### **Abstract**

The purpose of this research was to better understand how to foster an inclusive post-secondary learning environment which is culturally responsive to the needs of Saskatchewan Polytechnic Indigenous paramedic. Approval from the Royal Roads University and University of Saskatchewan Research and Ethics Boards was obtained prior to commencing this study.

The methodology of this qualitative study was an engaged, action oriented approach. The primary method of data collection consisted of Journey Mapping each participant's experiences while they had been enrolled in the Paramedic programs. Storytelling was utilized in facilitating the narration of the participants' lived experiences.

Four key findings were identified:

- Navigating systems
- Building community
- Nurturing growth
- Celebrating success

Drawing from the research data, four conclusions were made:

- There is a need to implement student preparedness strategies
- There is a need to leverage resources already in place
- There is a need to expand learner pathways and grow faculty
- There is a need to slow down and celebrate success

An engaged, action-oriented approach to this research offered the opportunity to discover, address, and champion Indigenous student success within the Paramedic programs. Fostering an inclusive post-secondary learning environment that is culturally responsive to the needs of Indigenous Paramedic program students will aid in alleviating current barriers by embracing diversity and empowering Indigenous learners. This study enabled me to immerse myself into the role of leader-as-inquirer in an effort to support positive social change for Indigenous students within the Saskatchewan Polytechnic Paramedic programs.

**#PRS2019**

**#PACE2019**

## **A09: The psychological health and wellbeing of Emergency Communication Centre workers: An international study**

Presenting author: Elizabeth A Asbury\*

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Other authors: Lisa Holmes, Erin Smith, Kate Jennings, Glenn Legault

### **Abstract**

**Introduction:** The mental health and wellbeing of emergency services personnel is an ongoing, urgent problem. Anecdotally, attrition and burnout among Emergency Communications and Dispatch (ECD) staff far exceeds that of other emergency services personnel. Ambulance ECD staff operate in a highly regulated, highly stressful environment, managing many thousands of emergency calls every day, but little is known about the mental health and wellbeing of ECD operators.

**Methods:** Three international locations with similar socioeconomic characteristics and geographic mix of urban, rural and remote populations were identified. All ambulance ECD personnel from New Zealand, Northern Territories (Australia) and Ontario (Canada) are being asked to complete an anonymous online questionnaire, designed to assess levels of trauma, PTSD, burnout, anxiety, depression, suicidality, social support, resilience and job satisfaction. Demographic information will be requested, including age, occupation, experience, geographic location, exercise frequency and alcohol consumption.

**Results:** Data collection is currently underway in Australia and New Zealand at St John Ambulance Northern Territories Emergency Communication Centre (ECC) and the Wellington Free Ambulance Central ECC. Permissions are currently being sought in Canada. The total cohort from all three international locations will be approximately 500 participants.

**Conclusions:** By comparing the experiences of ECD personnel from a number of geographically and socioeconomically similar international locations, this study has the ability to substantially increase the understanding of ECD attrition, burnout, trauma and mental health in relation to occupational satisfaction and support. The findings will provide evidence for targeted intervention and will provide support for the provision of mental health resources.

**#PRS2019**

**#PACE2019**

## **A10: A new perspective on continuing mental health education: A case study on how reflective practice can improve resilience in paramedics**

Presenting author: David Wolff\*

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Other authors:

### **Abstract**

As a stress resiliency strategy, the question adult education literature leaves is whether or not an individual can learn how to prepare for critical stressors. The literature suggests that it is the influence or the lens of the individual's beliefs that create the reality they respond to. Facilitating or guiding an individual to become a self-directed learner, to become more open to transformational learning, may serve as a self-directed resilience strategy.

The purpose of this case study is to reveal a new perspective on continuing mental health education, to improve resilience to occupational stress injury in paramedics. The objective of this study is to identify if paramedics can self-initiate their own cognitive restructuring, seeking out opportunities to change, and adapting to accommodate new meanings derived from experiences into their belief structures.

The central question is; How can paramedics be trained to think critically in order to prepare for critical stressors as an occupational stress resiliency strategy? My sub questions are:

What strategies do paramedics use to engage in critical reflection following critical stressors they experience?

What changes took place as a result?

How might reflective practice be used to foster transformational learning as a resilience strategy?

The retrospective investigation will utilize self-study, interviews, and focus group methodologies, and aligns with a constructivist approach. Analysis will be inductive and comparative.

The university-accepted research proposal is currently at their Research Ethics Board. The study will begin March 1, 2019 and completed Sept. 1, 2019.

**#PRS2019**

**#PACE2019**

## **A11: Facteurs psychosociaux de risque et de protection de la santé chez les travailleurs du transport sanitaire**

Presenting author: Pau Navarro Moya\*

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Other authors: Esperança Villar Hoz; Mònica González Carrasco

### Abstract

Introduction : Les ambulanciers paramédicaux ou EMT du modèle anglo-américain (AA) et les techniciens du modèle franco-allemand (FA) sont exposés à des facteurs de risque psychosociaux pouvant mener à l'épuisement professionnel, entre autres problèmes de santé. Peu d'études fournissent des informations sur les facteurs de protection et aucune étude comparative entre les deux modèles (AA et FA) n'a été réalisée en tenant compte du point de vue des professionnels. L'objectif de la présente étude est d'identifier les éventuels facteurs de risque-protection contre l'épuisement professionnel, en se basant sur la comparaison des deux modèles du point de vue des professionnels. Un document atteste de l'approbation éthique de l'entité où les entretiens du modèle FA ont eu lieu. Méthode : Recherche qualitative. Douze entretiens sont analysés à parts égales selon les modèles franco-allemand (Catalogne) et anglo-américain (Québec). L'analyse et la codification ont été réalisés selon le modèle écologique de Bronfenbrenner, avec le support informatique du programme N-VIVO.

Résultats : Les facteurs de risque les plus cités parmi les professionnels sont la surcharge de travail, les relations avec les responsables, le manque de conciliation, le modèle institutionnel, la privatisation des entreprises et la bureaucratisation de la gestion. En ce qui concerne les facteurs de protection, il est fait mention du service d'urgence, des relations avec les collègues et de la reconnaissance sociale, entre autres.

Conclusion : D'après les données, on peut conclure qu'il existe plus de similitudes que de différences dans la perception des facteurs de risque-protection entre les professionnels des deux modèles.

**#PRS2019**

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## **A12: Effects of Fatigue on Performance of CPR, Driving Simulation and Ability to Recall Information of Second Year Paramedic Students**

Presenting author: Eric Alonzi\*

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Other authors: Zach Kostigian, Chuck Hinkley, Ian Mcleod

### **Abstract**

**Introduction:** Shiftwork is common for paramedics increasing the risk of fatigue. Fatigue has been shown to contribute to adverse events in other areas of medicine, however the impact on paramedics is not known. The purpose of this study was to examine the effect of fatigue on paramedic student performance during lifesaving interventions and basic paramedic duties.

**Methods:** This was a crossover simulation study recruiting 8 second year paramedic students. Volunteers performed two simulations on two different occasions; once in a fresh state (8+ hours sleep) and once in a fatigued state (<2 hours sleep). A high-fidelity simulator recorded the efficacy of compressions and ventilations, and a driving simulator and global rating scale (GRS) were used to assess driving performance. Prior to the driving simulation participants were asked to memorize 8 data points and recall them after their simulation.

**Results:** We observed an overall mean performance decrease in the fatigued group amongst all skill stations in most categories. An overall mean decrease in performance of compressions ( -13.6%) and ventilations ( -22.5%) was seen in fatigued participants. A mean decrease in all GRS categories was seen across all participants, as well as a decrease in the number of data points memorized. One potentially fatal collision was observed in the fatigued group.

**Conclusion:** Fatigue was associated with decreased performance in cognitive ability, situational awareness and technical skills. Increased fatigue result in poor performance of CPR and driving simulation.

**#PRS2019**

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## **A15: Paramedic Student Preparedness for Managing a Mental Health Crisis in the Field**

Presenting author: Kelsey Zwicker\*

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Other authors: Courtney Kraik, Jessica Riley

### Abstract

**Introduction:** Mental health crises are frequent in the prehospital setting. However, 43% (3/7) of paramedic programs from accredited colleges in Ontario do not have a course in crisis management. Our objective was to determine if paramedic students feel confident with the training they have received in school to de-escalate a mental health crisis.

**Methods:** This study tested 13-second year Georgian College paramedic students through a 7-minute scenario using the Global Rating Scale. The scenario consisted of a sixteen year-old female locked in the bathroom with suicidal ideations. The objectives were to recognize the mental health crisis, build a good rapport with the patient, and effectively de-escalate the situation. After the scenario participants were required to complete a survey on their perceived performance.

**Results:** On average participants were considered competent or better in all categories of the GRS except situational awareness where 7/13 (54%) scored not competent. 80% of participants who were deemed unsafe (score of 1) in situational awareness were in the 21-23 age group. 5 of 13 (38%) participants identified that the skills they utilized came equally from school and past experiences, 3 of those participants scored in the highest percentile. Despite students performing well overall, there was a disparity noted between perceived and actual performance.

**Conclusion:** Overall paramedic students performed well in scenarios, however, there was a discrepancy in their comfort and perceived performance. More research is required to examine the cause of this discrepancy

**#PRS2019**

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## **A16: The Effect of Operator Position on the Quality of Chest Compressions Delivered in a Simulated Ambulance**

Presenting author: Scott Mullin\*

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Other authors: Paul O'Connor, Sinead Lydon

### Abstract

**Introduction:** To compare the quality of chest compressions (CC) in the two positions they can be delivered by a paramedic in an ambulance.

**Methods:** A randomized counterbalanced study was carried out with 24 paramedic students. Simulated CC were performed in a stationary ambulance on a CPR manikin for 2-minutes from either: (A) an unsecured standing position or (B) a seated secured position. Participant's attitudes toward the effectiveness of the two positions were also evaluated.

**Results:** The mean total number of CC were not significantly different standing unsecured (220; SD=12) as compared to seated and secured (224; SD = 21). There was no significant difference in mean compression rate standing unsecured (110 compressions per minute; SD= 6) as compared to seated and secured (113 compressions per minute; SD= 10). CC performed in the unsecured standing position yielded a significantly greater mean depth (52mm; SD= 6) than did seated secured (26mm; SD= 7;  $p < .001$ ). Additionally, the standing unsecured position produced a significantly higher percentage (83%; SD= 21) for the number of correct compressions, as compared to the seated secured position (8%; SD= 17;  $p < .001$ ). Participants preferred to deliver CC from a standing position and believed that CC delivered from standing were more effective than those delivered when seated.

**Conclusions:** The quality of CC delivered from a seated and secured position is inferior to those delivered from an unsecured standing position. There is a need to consider how training, technologies, and ambulance design can impact the quality of CC.

**#PRS2019**

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## **A17: What Are(n't) we Talking About? A Narrative Review of the Paramedic Mental Health Literature**

Presenting author: Justin Mausz\*

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Other authors: Elizabeth Donnelly, Sandra Moll, Meghan McConnell

### Abstract

**Introduction:** The issue of post-traumatic stress disorder and, in particular, suicide in the paramedic community has been brought to the forefront of public attention. As a result, there has been a resurgence of interest as researchers work to understand the scope of the problem, and an impetus for policymakers at all levels to act to address what has been described as a crisis in Canada.

**Methods:** Drawing on a narrative review methodology, and using an iterative and comprehensive approach, our review focuses specifically on four key questions: (1) What is the scope of the problem? (2) What are the issues? (3) What are we talking about? And (4) What aren't we talking about? These questions are intended to explore the epidemiology of work-related mental illness among paramedics, its causes and contributing factors, the on-going industry response, and the gaps in the peer-reviewed literature.

**Results:** Despite this recent work, research into the mental health and wellbeing of Canada's paramedics remains methodologically limited, offering only a partial understanding of the issues. The extant literature focuses primarily on the prevalence and risk factors of work-related mental illness, providing a clinical perspective, that – although informative – does not adequately capture the underpinning social and cultural characteristics of paramedic mental health and wellbeing.

**Discussion & Conclusion:** We will discuss the implications and opportunities of viewing paramedic mental health through both a clinical and social science lens in capturing a more holistic understanding of the problem and its potential solutions.

**#PRS2019**

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## **A20: “Assessment of Access to Patient History: A Pilot Study in Saskatchewan”**

Presenting author: Jacquie Messer-Lepage\*

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Other authors: Jennifer Williams, K.M. Rashed Al-Mamun

### Abstract

Paramedics provide timely and safe patient assessment and diagnosis, intervention on scene and transportation where necessary. It is important that providers be appropriately skilled, informed, and sufficiently resourced to support positive patient outcomes.

Patient history or test results are seldom available to support a clinical assessment conducted by a paramedic. Providing paramedics electronic access to patient medical history (known as an eViewer) is a new approach to client-centered healthcare in Saskatchewan.

The aim of this study was to qualitatively explore and understand perceptions and experiences of two primary groups: paramedics who had access to patient medical history through an online portal called eViewer for one year, and paramedics of equivalent experience who did not have access to patient medical history.

Face-to-face and telephone semi-structured interviews were considered the most suitable primary data collection tool to access this knowledge and to enable flexible exploration of this initiative.

Results suggested that patient history was highly valued or believed to be very valuable by both paramedics with access to eViewer and those without access. Paramedics felt that in general, access to patient history improved health outcomes, although eViewer was not always accessed.

Risks identified by practitioners included an overreliance on the health information to determine treatment, and concerns regarding the practitioner focus being taken away from the patient. Policy, guidelines, and parameters for the use of eViewer were also identified as essential in order to ensure that practitioners understand their obligations and appropriate usage is defined clearly.

**#PRS2019**

**#PACE2019**

## **A22: A service evaluation of a dedicated pre-hospital cardiac arrest response unit in the North East of England**

Presenting author: Paul Younger\*

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Other authors: Graham McClelland, Daniel Haworth, Amy Gospel, Paul Aitken-Fell

### Abstract

**Aim:** This study describes the introduction of a specialist cardiac arrest response unit by the North East Ambulance Service NHS Foundation Trust, with the aim of improving treatment and outcomes of out-of-hospital cardiac arrest patients, in the North East of England.

**Methods:** This study is a retrospective analysis of prospectively collected data, describing all cases where the cardiac arrest response unit was dispatched in the first 12 months of operation (January 2014 to January 2015).

**Results:** The cardiac arrest response unit was activated 333 times during the first year of operation and attended 164 out-of-hospital cardiac arrest patients. The cardiac arrest response unit demonstrated a significant impact on return of spontaneous circulation sustained to hospital (OR 1.74 (95% CI 1.19–2.54),  $p = 0.004$ ) and survival to discharge (OR 2.08 (95% CI 1.12–3.84),  $p = 0.017$ ) compared with the rest of the North East Ambulance Service NHS Foundation Trust.

**Conclusion:** The cardiac arrest response unit project demonstrated an improvement in return of spontaneous circulation and survival to discharge compared to current standard care. The specific mechanism, or mechanisms, by which the cardiac arrest response unit influences patient outcomes remain to be determined.

**#PRS2019**

**#PACE2019**

## **A23: UK Student Paramedic Perspectives of Non-Technical Skills in the Out-of-Hospital Cardiac Arrest - Is there a need for a paramedic NTS OHCA specific assessment tool?**

Presenting author: Stefanie Cormack\*

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Other authors: Steve Scott, Alex Stedmon

### Abstract

Social and cognitive skills that enhance team performance are known as Non-Technical Skills (NTS). Adopted from aviation these skills have been used in surgery, anaesthetics and emergency department teams to improve teamwork and performance. General Paramedic NTS have been identified and include leadership, communication and situational awareness, but none have been related to an Out-of-Hospital Cardiac Arrest (OHCA) where a high performing team is vital. To establish an evidence base and inform the development of a NTS OHCA assessment tool, a systematic literature review was undertaken. Databases (Medline, PubMed, AMED, PsycINFO, PsycARTICLES and CINAHL) were searched using MeSH terms (out-of-hospital, prehospital\$, paramedic\$, ambulance, EMS, non-technical skills, soft skills, human factors and behavioural marker systems). A total of 421 papers were sourced and eleven included for the review. There was a paucity of evidence for NTS in the OHCA with the majority of evidence related to in-hospital practice. Following this Student Paramedic perspectives were examined using a Likert scale questionnaire and semi-structured interviews. Seventy Student Paramedics completed the questionnaire and a total of sixteen students participated in the semi-structured interviews. Data were anonymised and analysed using SPSS Chi Square test and thematic descriptive and In Vivo coding. Students felt that a NTS OHCA assessment tool would be beneficial and also identified barriers in current practice, including communication and experience. Key NTS identified included; team coordination, communication, situational assessment and knowledge and decision making. These will be further explored and a Paramedic OHCA NTS assessment tool designed.

**#PRS2019**

**#PACE2019**

## **A24: Life in the Matrix: Simulation in Public Safety Education**

Presenting author: Ron Bowles\*

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Other authors:

### Abstract

Justice Institute of British Columbia (JIBC) is a unique public post-secondary institution providing education and training to a wide range of community, health, and public safety professions; on any given day, visitors to JIBC will see groups of students engaged in simulations ranging from police incidents and prisoner take-downs through interpersonal conflict to complex rescue and medical responses. This presentation presents preliminary findings from an exploratory study to define and describe the range of simulation activities at JIBC; explore best practices in creating, conducting, and debriefing scenarios; and discussing the foundational educational theories that support the use of simulation in community, health, and public safety contexts.

**#PRS2019**

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## **A25: The problems on your desk: A research study to define and describe paramedic practice in Canada.**

Presenting author: Ron Bowles\*

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Other authors:

### Abstract

Paramedicine is a young discipline, with modern ambulance services emerging in Canada in the 1960s. Since then, the profession has evolved into a wide range of practice settings, moving beyond emergency care and transportation of the sick and injured to providing a broad spectrum of care. Yet, across Canada, paramedicine has developed unevenly, with varied models and practices meeting differing needs in each province and territory. The range of concepts and terms across the country make it difficult to describe and compare systems, and there is little aggregated data at a national level. This study, funded by the Canadian Safety & Security Program, will develop a framework and national standards for describing paramedics, their practice settings, their patients and communities. In the first year, an applied research study will build “user case scenarios” that explore the data needs of key stakeholder groups based on “the problems on your desk.” These scenarios will guide the development of a conceptual framework, including core concepts, terms, definitions, taxonomies and data models describing paramedicine in Canada. This framework will form the foundation for the second phase of the project: developing a set of national standards that will be the basis of a future national Canadian Paramedic Information System. The presentation will describe the work to date and emerging findings from the study. Partners in this project include Justice Institute of British Columbia, BC Emergency Health Services, Paramedic Association of Canada, Paramedic Chiefs of Canada, Regional Paramedic Programs of Eastern Ontario and CSA Group.

**#PRS2019**

**#PACE2019**

## **A26: Sex and gender equity in prehospital ACS care**

Presenting author: Nicola Little\*

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Other authors: Neil McDonald, Erin Weldon, Rob Grierson

### Abstract

**Introduction:** Recent research in cardiac care has identified significant sex- and gender-based differences across many outcomes. Our EMS agency recently addressed sex-based differences in assessment through protocol changes and in-service training. This study aims to investigate the effect of these interventions.

**Methods:** We performed a retrospective database review including all patients who met broad criteria for cardiac assessment. Primary outcomes were rates of 12-lead acquisition, grouped by dispatch determinant and divided by patient sex. Data collection started in January 2017 and is ongoing. 12-lead acquisitions were analyzed by sex (comparison of two proportions) before and after the protocol change (up to October 2018). Further analysis (available in June 2019) is tracking the primary outcomes through process-control charts on a monthly basis.

**Results:** At baseline, women showed a lower rate of 12-lead acquisition compared to men across all complaints. After protocol changes, the differences between women and men (shown as women – men) in selected complaints remained significant for chest pain (-6.7, 95%CI: -1.6,-11.7, p=0.01) and shortness of breath (-10.0, 95%CI: -3.2,-16.7, p=0.004), but not for syncope: (-1.0, 95%CI: -7.0,9.0, p=0.81).

**Conclusion:** Baseline rates of 12-lead acquisition in one urban EMS agency appear to be lower in women than men. After protocol revisions aimed at reducing these differences, these rates show minor changes. Ongoing analysis will examine the long-term effect of these interventions.

**#PRS2019**

**#PACE2019**

## **A27: Determining the state of current practice in Ontario community paramedicine programs**

Presenting author: Matthew S Leyenaar\*

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Other authors: Ryan Strum, Mashiat Haque, Brent McLeod, Andrew Costa, Michael Nolan, Samir Sinha

### Abstract

Community paramedicine (CP) programs have been classified as referral programs, clinic programs, or home visit programs. Implementation of CP programs is often subject to local variation or customization. Without defined clinical guidelines for community paramedicine, it is difficult to ascertain what should be included in evolving models of care, whether interventions are beneficial, what training requirements for CP should be, or whether paramedics are meeting program objectives. Our objective was to describe the state of current practice of CP in Ontario to inform future program evaluation.

We performed an environmental scan of all CP programs in Ontario, Canada, and employed content analysis to

describe current models of care. Paramedic services reported on program design, paramedic training requirements, assessments and interventions, and health system partnerships.

Our preliminary results are based on responses from 43 of 52 paramedic services. 34 were providing referral programs, 19 were providing clinic-based programs, 24 services were providing CP home visit programs, 8 were providing other types of programs, and 4 were not engaged in CP activities. Other CP initiatives included integrated response, public health support, and coordinated case management. Training requirements, assessment and interventions, and health system partnerships varied based on program design.

CP programs represent improved integration with health system partners, means for additional training of paramedics, improved patient care, reduced health system utilization, and high levels of patient satisfaction. Future work on practice guidelines and paramedic training can build from descriptions of CP models of care to improve quality of care and patient safety.

**#PRS2019**

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## **A28: Evaluation of outcomes after implementation of a provincial prehospital bypass standard for trauma patients – an Eastern Ontario experience**

Presenting author: Julie Sinclair\*

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Other authors: Michael Austin, Shannon Leduc, Susan Duncan, Jason Rouleau, Penny Price, Chris Evans, Christian Vaillancourt

### Abstract

**Objective:** The objective of this REB approved study was to assess the impact of a newly introduced prehospital field trauma triage (FTT) standard, allowing a hospital bypass and direct transport, within 30 min, to a trauma centre (TC).

**Methods:** We conducted a 12-month multi-centred health record review of paramedic and ED records following implementation of the FTT standard in nine paramedic services. We included adult trauma patients transported as urgent that met FTT standard criteria. We developed and piloted a data collection tool and obtained consensus on all definitions. The primary outcome was the rate of appropriate triage to a TC, where “appropriate triage” was considered: ISS  $\geq$ 12, admitted to ICU, non-orthopedic operation, or death. We report descriptive analysis.

**Results:** 570 patients were included: mean age 48.8, male 68.9%, attended by Advanced Care Paramedic 71.8%, MVC 20.2%, falls 29.6%, stab wounds 10.5%, median initial GCS 14, mean initial BP 132, prehospital fluid administered 26.8%, prehospital intubation 3.5%, transported to a TC 76.5% (n=436). Of those transported to a TC, 308 (72.5%) had bypassed a closer hospital. Of those that had bypassed a closer hospital, 136 (44.2%) were determined to be an “appropriate triage to TC”.

**Conclusion:** The FTT standard can identify patients who should be transported to a TC but this may be at a cost of burdening the system with poor sensitivity. Continued work is needed to appropriately identify patients requiring transport to a TC.

**#PRS2019**

**#PACE2019**

## **A29: Factors affecting paramedic students' career choice**

Presenting author: Gürkan Özel\*

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### **Abstract**

**Purpose:** Number of paramedic education programs opened had been steadily increased in respond to the popular demand over the last 10 years in Turkey. The purpose of this study was to determine the factors affecting the career choice of paramedic students currently enrolled in paramedic programs in the city of Ankara (Turkey).

**Materials and Methods:** For this descriptive study, a 20-item survey was developed by the researchers. A total of 419 paramedic students, both year-1 and year-2, in Ankara consented to complete the survey. Frequency, percentages and chi-square tests were used when analyzing data. A p-value < 0.05 was considered as statistically significant.

**Findings:** Majority of the paramedic students (79.4%) stated that choosing paramedicine was their own decision. Also 65.2% (n=232) put the main reason for choosing this profession as it is an adrenaline filled career, 61.6% as the privilege of working in an ambulance and 49.6% as the desire to be a team leader.

**Conclusion:** This study reveals paramedic students in Turkey have variety of motivations to choose paramedicine as a profession. These results can be used as a guideline by school counsellors and paramedic educators.

**#PRS2019**

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### **A30: The relationship between socioeconomic status and the academic performance of paramedic students.**

Presenting author: Alan M. Batt\*

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Other authors: Lydia Hamel, Justin Hunter, Christopher Goenner, Kathleen O'Connor, Tom Fentress, Adisack Nhouyvanisvong, Donna Gridley, Ashley Procum, Sahaj Khalsa

#### Abstract

**Background:** There are several factors that can affect a student's academic performance, one of which is socioeconomic status (SES). Research indicates that students of lower SES are educationally disadvantaged. This study sought to examine the relationship between paramedic student academic performance and county-level SES indicators.

**Methods:** Student academic performance data from Fisdap was combined with publicly available SES data for counties within California, Mississippi, Louisiana, Texas and Virginia. Multiple linear regression modeling was performed to determine the relationship between income, high school graduation rate, poverty and food insecurity with first-attempt scores on the Fisdap Paramedic Readiness Exam (PRE) versions 3 and 4. ANOVA was performed between entrance exam (EE) score and parent education level. **Results:** There were 3,697 records across 151 counties (PRE3), 1,293 records across 60 counties (PRE4), and 3,607 records (EE) respectively. There was a significant collective effect between income, poverty, graduation rate, food insecurity, and both PRE3 and PRE4 scores. Students whose parents had a high school diploma or less had the lowest EE scores (mean 77.42, SD 9.21). Students whose parents had a graduate degree had the highest EE scores (mean 81.55, SD 8.22).

**Discussion and Conclusion:** County-level SES indicators are related to paramedic student academic performance. Parent education level appears to be related to entrance exam scores. These findings support the future collection of individual student level SES data in order to further explore the relationship between SES and academic performance.

**#PRS2019**

**#PACE2019**

### **A33: Canadian National Standard for Ergonomic Design of Ambulance and Equipment**

Presenting author: Amin Yazdani\*

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Other authors: Steve Fischer

#### Abstract

The paramedic sector is in critical need of standards to help protect health and improve performance which will result in an elevated quality of care to all Canadians. The research was focused on the design of ambulances and equipment inside the ambulances due to poor access to well-designed equipment or an inability to provide pre-hospital emergency care to the patient due to cramped spaces or an ill-placed stretcher could have serious threats to patient health and well being. The research started with identification of all interventions or features of the ambulance patient compartment and associated equipment that could affect paramedic's performance, health, and safety. Considering these challenges, an environmental scan of existing standards & guidelines in Canada, completed a systematic review of the academic literature concerning ambulance vehicle design, paramedic equipment design, and usage. A needs assessment was conducted to identify issues, gaps, key stakeholders (e.g., labour, management, procurement, regulators, manufacturers), including a vehicle and equipment survey to identify equipment and ambulances currently in operation across Canada. One of the major findings of the research was a lack of ergonomics (Human Factors Engineering) and scientific evidence in the current ambulance design standards. There were "no science-based standards that govern ambulance patient compartment design and safety. This finding led to development of an evidence-informed Canadian National Standard that identifies the minimum human factors/ergonomics design and usage requirements for emergency response vehicles and equipment with consideration to paramedic and patient safety

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### **A34: Paramedic students attitudes towards homelessness**

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#### **Abstract**

**Introduction:** When paramedics are dispatched, it is expected that every patient receives the same level of care regardless of variable factors. Homelessness is a growing social issue across Canada that is particularly prevalent in urban areas. The quality of healthcare delivered to individuals experiencing homelessness may be influenced by negative attitudes held by healthcare professionals. There is an absence of literature quantifying the perspectives of paramedics towards homelessness; therefore, the focus of this study was to identify the attitudes of paramedic students towards homelessness and to continue the conversation in regards to the evolving educational needs of paramedic students.

**Methods:** This study employed a longitudinal design of a convenience sample of first year paramedic students in a college program in Ontario, Canada. The Health Professional's Attitude Towards the Homeless Inventory (HPATHI) was distributed to participants before and after placement and clinical exposure. The questionnaire includes 19 statements which participants respond to on a Likert scale. Mean scores were calculated, and statements were categorized into attitudes, interest, and confidence. Data were collected post-placement on interactions with persons experiencing homelessness. **Results:** A total of 52 first year paramedic students completed the HPATHI pre-placement and 47 completed the questionnaire post-placement. Mean scores for attitudes (pre 3.64, SD 0.49; post 3.85, SD 0.38,  $p=0.032$ ), interest (pre 3.91, SD 0.40; post 3.84, SD 0.39,  $p=0.51$ ) and confidence (pre 4.02, SD 0.50; post 3.71, SD 0.67,  $p=0.004$ ) were largely positive, but there was a demonstrated decreasing trend in confidence with, and interest in, working with those experiencing homelessness. Participants reported an average of 60 hours of placement, during which 15 participants (32%) reported interactions with people experiencing homelessness. **Conclusion:** First year paramedic students demonstrate overall positive attitudes towards those experiencing homelessness, and the mean score for attitudes improved over the surveys. However, there were demonstrable decreases in confidence and interest over time, which may be related to the type and frequency of interactions during clinical placement. Paramedic education programs may benefit from the inclusion of focused education on homelessness, specific clinical experiences, and education related to social determinants of health.

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## **A35: A scoping review of competency framework development**

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### Abstract

#### Background/Objectives

Healthcare professions require a competent workforce, with the necessary abilities and attributes to provide effective care and meet the needs of practice. These abilities and attributes are referred to as competencies, and are often outlined in comprehensive competency frameworks. Literature advises that these frameworks should be developed using multiple methods to ensure the results are valid and reliable. This study aimed to explore how competency frameworks were developed, and to identify implications of these development processes.

#### Methods

The Arksey and O'Malley framework was applied to undertake this scoping review. Six electronic databases (MEDLINE, CINAHL, PsycINFO, EMBASE, Scopus, and ERIC) and three grey literature sources (greyLit.org, Trove and Google Scholar) were searched using keywords related to competency frameworks. Studies of all types were included that described the development of a competency framework in a healthcare profession. Studies were screened for inclusion, and data were extracted independently by two reviewers. Data synthesis was both quantitative and qualitative.

#### Results

Among 5,710 citations, 190 were selected for analysis. The majority of studies were from the professions of nursing and medicine. Group techniques were utilised in 132 studies (70%), literature reviews were conducted in 103 (54%), and 76 (40%) outlined some level of stakeholder deliberation. Other methods are outlined in the paper. Use of methods varied from one singular method to eight different methods. Three or more methods were utilised by 125 studies (66%).

#### Conclusions

This review demonstrated that the development process varies substantially. This variation is a cause for concern, as the methods used may not have captured the complexities of clinical practice, or the broader social forces that influence it, and as a result some frameworks may be of limited value. The results of this review suggest there is a need to develop a robust process for developing competency frameworks that is informed by the literature, theoretically derived, and designed to capture the complexities of clinical practice.

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