

DIVISION OF EMS
DEPARTMENT OF EMERGENCY MEDICINE
DALHOUSIE UNIVERSITY
2015-2016 ANNUAL REPORT

Mission

To advance the scientific knowledge of EMS by advocating for, facilitating and performing world class research, knowledge translation, education and leadership.

Vision

To be recognized as a centre of excellence for (the advancement and sharing the EMS scientific knowledge) Knowledge Translation in EMS through measurable impact on national health policy.

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HISTORY

The Division of Emergency Medical Services (EMS), Dalhousie University Department of Emergency Medicine, was established under the leadership of Dr David Petrie, in 2001 to:

- Encourage and participate in EHS/EMS research.
- Provide education regarding all aspects of EHS/EMS to students, clinical clerks and residents.
- Establish a fellowship program to educate the next generation of EMS medical directors.

Dr Ed Cain served as Division Director from 2007-2013. Under Dr Cain's leadership the Division flourished. The Prehospital Evidence-based Practice (PEP) database and Prehospital Evidence-Based Practice (P-EBP) critical appraisal course for paramedics become nationally known. An EMS Fellowship to train future EMS physicians was established.

Dr Alix Carter became director of the Division in January 2014. Dr Carter continues the work started by her predecessors, and with a growing and talented team, seeks to expand the capacity and calibre of the Division's work in EMS Education, Knowledge Translation, and Research.

DIRECTOR'S MESSAGE

(to be completed)



Dr Alix Carter MD MPH FRCPC
Director, Dalhousie Division of EMS
Department of Emergency Medicine

DRAFT

STRENGTHENING OUR PEOPLE AND ORGANIZATIONAL GOVERNANCE

An engaged and mutually supportive team, focused on the execution of shared goals and the pursuit of excellence

Strategic Plan

Vision: To be recognized as a centre of excellence for Knowledge Translation in EMS through measurable impact on national health policy			
CORE Strategic Directions 2014-2019 Five Year Goals			
Improving Patient Care and Population Health Through Knowledge Translation National leadership in evidence based practice in emergency medical services			
Educating EMS Leaders A nationally recognized centre for education of leaders in emergency medical services		Advancing EMS Research A research enterprise continually striving for multi-site interprofessional collaboration to advance the science of emergency medical services	
Strengthening our People and Organizational Governance An engaged and mutually supportive team, focused on the execution of shared goals and the pursuit of excellence			
Values And Guiding Principles *these values we share with the Department of Emergency Medicine			
Innovation	We constantly seek the most current evidence to ensure optimal practice and we are not bound by past practice	Evidence-Based Practice*	We effectively retrieve, evaluate, integrate, weight and apply knowledge to patient care and system design in the context of patient and social/cultural values.
Capacity-Building	We undertake activities and methods which ensure we continuously expand the capacity of the overall research enterprise	Advocacy*	We speak up for patient and population interests. Pushing for effective change from providers and policy makers.
Mentorship	We are committed to offering our time and energy to build and hone the talents of those who seek to learn	Critical Thinking*	We systematically and continually assess our thinking for clarity, accuracy, bias, precision, logic, and relevance.
Inter-professional collaboration*	We work together and value different experience and perspectives to better understand and find solutions to complex problems.	Professionalism*	We are committed to the health and well being of individuals and society through ethical practice, respect, collegiality, and high personal standards of behaviour.
EMS is:			
The provision of primary, acute and critical care and the interfaces between community, out of hospital and in-hospital systems of care			

Enhancing Patient Care and Population Health Through Knowledge Translation

- C1. PEP: Prehospital Evidence-Based Practice Project
- C2. Journal Club
- C3. Evidence synthesis
- C4. KT Cycle
- C5. Research day/week

Educating EMS Leaders

- E1. Take a leadership role in evidence-based EMS practice.
 - E1.1 Educating paramedics in EBP.
 - E1.2 Educating management in EBP.
 - E1.3 Educating physicians in EBP.
 - E1.4 Educating nursing, inter-professional groups in EBP.
- E2. Develop exemplary EMS leaders.
 - E2.1 EMS Fellowship.
 - E2.2 Peds EM and Critical Care trainees.
 - E2.3 Undergraduate and postgraduate medical trainees.
 - E2.4 Paramedic bursary for post-graduate education.
- E3. Advocate for and support the development of a university based paramedic education.
- E4. Enable education of new investigators in best practices for research.

Advancing EMS Research

- R1. Ensure adequate resources for EMS researchers (time, funds, mentorship).
- R2. Foster a clear and shared vision for priority research in Nova Scotia.
- R3. Chair an active and engaged Nova Scotia EMS Research Steering Committee.
- R4. Promote and support inter-professional research.
- R5. Work to reduce systematic challenges in EMS research (eg. REB, data linkage, privacy legislation etc.).
- R6. Further the work of the National EMS Research Agenda.
- R7. Increase critical mass/reach of Division.
- R8. Foster undergraduate and postgraduate medicine interest in EMS research.
- R9. Encourage and support paramedics to publish and present EMS research.

Strengthening our People and Organizational Governance

- O1. Entrench a governance model that ensures appropriate leadership, committee structure, team members and administrative support.
- O2. Ensure sustainability of administrative structure and process.
- O3. Maintain and fund physical resources
- O4. Strengthen staff and faculty mentorship, career path and leadership development.
- O5. Ensure ongoing fiscal responsibility through transparent and priority-based budgeting, cost recovery, future funding sources.
- O6. Advocate for the mission, vision and values of the Division.
- O7. Ensure day to day activities of the Division continue to embody mission, vision and values.
- O8. Ensure activities of Division are effectively fulfilling mission, vision and values.

Current Members

Director:

Dr. Alix Carter

Members:

Dr. Stacy Ackroyd

Ryan Brown

Dr. Jolene Cook

Corinne DeMone

Susan Dugas

Patrick Froese

Dr. James French

Dr Judah Goldstein

Jennifer Greene

Dr. Carl Jarvis

Jan Jensen

Dr. George Kovacs

Melissa MacDougall

Dr. Kirk Magee

Dr. Jennifer McVey

Dr. David Petrie

Dr. Tushar Piche

Dr. Aaron Sibley

Dr. Ron Stewart

Dr. Andrew Travers

Jay Walker

Dr Aaron Sibley

Dr Trevor Jain

NB: Membership in the Division of EMS does not equate with having a faculty position at Dalhousie University. To hold the title of lecturer, Assistant Professor, Associate Professor or Professor and become a member of the Department of Emergency Medicine at Dalhousie, one must have a graduate degree or an MD and complete a different application process, with final approval by the Dalhousie Board of Governors.

Committees

The Division chairs and serves as secretariat for the Nova Scotia EMS Research Steering Committee. (more detail can be found under "Advancing EMS Research") on the first Wednesday of every other month.

The Division membership meets on the first Wednesday of every other month, alternating with the Nova Scotia EMS Research Steering Committee. All members are invited to attend.

Multiple sub-committees are responsible for the various areas of work done by the Division, including:

- PEP: Jen Greene
- P-EBP: Jen Greene
- Journal Club: Ryan Brown
- Research Day: Judah Goldstein

Ensure activities of Division are fulfilling mission, vision and values

The mission of the Division of EMS is to advance the scientific knowledge of EMS by advocating for, facilitating and performing world class research, knowledge translation, education and leadership.

Our vision is to be recognized as a centre of excellence for (the advancement and sharing the EMS scientific knowledge) Knowledge Translation in EMS through measurable impact on national health policy.

As we endeavour to fulfill this mission and vision, we first realized that we must be able to measure our impact. The Division undertook several planning sessions this year toward fulfilling this goal. In particular, the Division worked to establish metrics by which to measure the Division's impact and achievements, thereby enabling setting of goals for improvement, and also a strategy by which to communicate those achievements with stakeholders including the public. A plan is in place to follow the impact and "H" factors and strive for higher impact, as well as the Altmetrics scores given our goal of translation to health policy and clinical paramedicine. This work is ongoing.

The Division worked this year to streamline access to infrastructure such as administrative support, printers, and voicemail, as well as encouraging cross-project engagement.

The Prehospital Evidence Based Practice Facebook page has 1700 followers.

The Division was invited to develop a YouTube video describing PEP, for sharing on a FOAM education site.

IMPROVING PATIENT CARE AND POPULATION HEALTH THROUGH KNOWLEDGE TRANSLATION

National leadership in evidence based practice in emergency medical services

The Canadian Prehospital Evidence-based Practice (PEP) Project



Jennifer Greene is the PEP Coordinator. PEP is a freely available online repository of appraised EMS evidence. We conduct systematic searches on EMS interventions with a team of appraisers across Canada. This evidence is published on the PEP website and is used to create the 3x3 recommendations (the 3x3 table for Spinal Injury is shown below). These are in the form of a table based on the overall level and direction of the evidence body for each topic. PEP can be found at <https://emspep.cdha.nshealth.ca/Default.aspx>.



Spinal Injury

Recommendation		RECOMMENDATION FOR INTERVENTION			
		SUPPORTIVE (Green)	NEUTRAL (Yellow)	AGAINST (Red)	NOT YET GRADED (White)
STRENGTH OF EVIDENCE FOR INTERVENTION	1 (strong evidence exists)		<ul style="list-style-type: none"> In-line stabilization for intubation Steroid 		<ul style="list-style-type: none"> Hypertonic Saline Prehospital spine board removal
	2 (fair evidence exists)	<ul style="list-style-type: none"> C-Spine Clearance Scoop stretcher Self Extrication 	<ul style="list-style-type: none"> Cervical Collar Long Spinal Immobilization Devices 	<ul style="list-style-type: none"> Immobilization in Penetrating Trauma 	
	3 (weak evidence exists)	<ul style="list-style-type: none"> Leave Helmet in Place 		<ul style="list-style-type: none"> Short Extrication Devices (ex: KED) 	

Last Reviewed: Nov 23, 2015

Following each 3x3 table, the individual original research papers and their associated level and direction of evidence are listed, by clinical intervention. For example, the appraised papers which form the evidence for Long Spinal Immobilization Devices are shown below. Goals for PEP this year included the addition of “primary outcome” to each appraisal. This work is ongoing.

Long Spinal Immobilization Devices

Level	Direction	Primary Outcome	Reference
I	Opposes (Red)	Tissue interface pressure	Hemmes B, Brink PR, Poeze M. Effects of unconsciousness during spinal immobilization on tissue-interface pressures: A randomized controlled trial comparing a standard rigid spineboard with a newly developed soft-layered long spineboard. <i>Injury</i> . 2014;45(11):1741-1746. Medline
II	Supportive (Green)	Cervical motion	Chandler DR, Nemejc C, Adkins RH et al: Emergency cervical-spine immobilization. <i>Ann Emerg Med</i> 1992;21(10):19-21 Medline
II	Neutral (Yellow)	Deviation of the cervical spine from the neutral in-line position	Dixon M, O'Halloran J, Hannigan A, et al. Confirmation of suboptimal protocols in spinal immobilisation? <i>Emerg Med J</i> ; 2015; Online first Medline
II	Neutral (Yellow)	Subject perception of immobilization	Hamilton RS, Pons PT. The efficacy and comfort of full-body vacuum splints for cervical-spine immobilization. <i>J Emerg Med</i> . 1996;14:553-9. Medline
II	Neutral (Yellow)	Neurologic disability	Hauswald M, Ong G, Tandberg D et al: Out-of-hospital spinal immobilization: Its effect on neurologic injury. <i>Acad Emerg Med</i> 1998;5(3):214-219 Medline
II	Neutral (Yellow)	Speed of application	Mahshidfar B, Mofidi M, Yari AR, Mehrsorosh S. Long backboard versus vacuum mattress splint to immobilize whole spine in trauma victims in the field: A randomized clinical trial. <i>Prehosp Disaster Med</i> . 2013;28(5):462-465. Medline
II	Opposes (Red)	Tissue hypoxia	Berg G, Nyberg S, Harrison P, Baumchen J, Gurs E, Hennes E. Near-infrared spectroscopy measurement of sacral tissue oxygen saturation in healthy volunteers immobilized on rigid spine boards. <i>Prehosp Emerg Care</i> . 2010;14:419-24. Medline
II	Opposes (Red)	Incidence and severity of pain on visual analog scale	Lerner EB, Billitter AJ, Moscato RM. The effects of neutral positioning with and without padding on spinal immobilization of healthy subjects. <i>Prehosp Emerg Care</i> . 1998;2:112-6. Medline
II	Opposes (Red)	Tissue hypoxia	Linares HA, Mawson AR, Suarez E, Blundo JJ. Association between pressure sores and immobilization in the immediate post-injury period. <i>Orthopedics</i> . 1987;10:571-3. Medline
II	Opposes (Red)	Sacral interface pressure	Nemunaitis G, MD, Mary Joan Roach PhD, Melanie Boulet MD, FRCPC, Jennifer Ann Nagy MPT, Bram Kaufman MD, Melvin Mejia MD & Mohamed Samir Hetzy PhD, PE (2015) The Effect of a Liner on the Dispersion of Sacral Interface Pressures During Spinal Immobilization, <i>Assistive Technology</i> . 27:1, 9-17. Medline
		Optimal type of	

The team also worked to prepare manuscripts on the methods of PEP and the “State of the Evidence” in PEP for Respiratory complaints, Spinal Injury, and Palliative Care in the EMS context. These “state of the evidence” summaries from PEP were presented at multiple local, national and international venues including the Canadian Knowledge Translation Conference in May 2015, at CAEP in June 2015 and at The Paramedic Chiefs of Canada Conference in June 2015. State of the Evidence for Palliative Conditions was presented at the EMS Research Day in October 2015 as well as at NAEMSP Conference in January 2016.

Project changes: Highlights

A complete cycle of systematic search, critical appraisal by primary and secondary reviewer, has been completed for all the clinical conditions in PEP.

- 295 studies have been added this year
- 68 interventions have been added
- 92 3X3 Recommendations have been updated
- 64 evidence gaps being filled this year

EMS Journal Club



Ryan Brown assumed the Journal Club coordinator role in December of 2013. Ryan works closely with Jen Greene (Div. of EMS KT Coordinator) and Judah Goldstein (EHS Research Coordinator) to organize the meetings and select articles for review.

The goals for Journal Club for this year included exploring off-site and inter-provincial broadcasts. Meetings are held in person in the Central Region and linked via WebEx to the rest of the province. When available, the Sydney boardroom is linked with Redstone/Wilkinson via video conference utilizing EMC’s tele-presence resources. Attendees are typically those in the EHS system in Nova Scotia however there have been attendees link in from New Brunswick, British Columbia, Quebec, the US and Australia. Advertisements are sent out approximately 1 month prior to the JC on the EMC internal website (Pulse) and on social media through the P-EBP Facebook page.

2014 fiscal year Journal Club summary:		
DATE	TOPIC	ATTENDANCE
Apr. 17/14	EMS Dispatch Studies	9
Oct. 20/14	EMS Alternatives to Transport	9
Dec. 17/14	Adverse Effects of Prehospital Difficult Laryngoscopy	8
Feb. 17/15	Prehospital Tourniquet Use	7

Planned 2015 Journal Clubs:

- May 26th – Prehospital Use of Opioids in the Dyspneic Palliative Patient
- June 21st – TBA (Mental Health Focus, Liverpool Ed Day)

Evidence Synthesis

In addition to providing direct input in to the review of EHS Clinical Practice Guidelines via the inclusion of the colour-coded PEP direction and level of evidence recommendation, the Division of EMS continues to work with EHS and EHS Ambulance Operations to provide timely rapid knowledge synthesis for new or changing protocols. This year PEP added Palliative Support by EMS to the PEP database in response to the expansion of Nova Scotia paramedic scope of practice, and directly informed the new clinical practice guideline.

EMS Research Day



The **7th Annual EMS Research Day** was held on Tuesday, October 26th, 2015. Thank you to the presenters and attendees for making this such a successful event. One hundred and twenty people attended EMS Research Day this year, including attendees from Alberta, Ontario, Quebec, New Brunswick, Prince Edward Island and Newfoundland & Labrador! The event featured a keynote address by Dr. Jonathan Studnek, a PhD researcher and paramedic who is now Deputy Director, Mecklenburg EMS, Charlotte, North Carolina. This was followed by 12 research presentations (six by paramedics). Dr. Studnek's keynote address focused on a framework for developing systems of care.

Each research presentation was judged by a panel of four judges, and two awards were handed out:

- The **Top EMS Research Award** went to Justin Mausz of Centennial College with “Beyond Experience: Reformulations of Practice in Paramedic Airway Management.”
- The **Dr. Ron Stewart Top Paramedic EMS Research Award** went to Jan Jensen with “Time Savings with Use of Stroke Recognition Assessment Scales by First Aid and EMS Providers: An Evidence Review Using GRADE Methodology.”



Figure: (left to right) Former Division director Ed Cain, current director Alix Carter, award winners Jan Jensen and Justin Mausz, honoured guest and lifetime Division member Ron Stewart

Networking

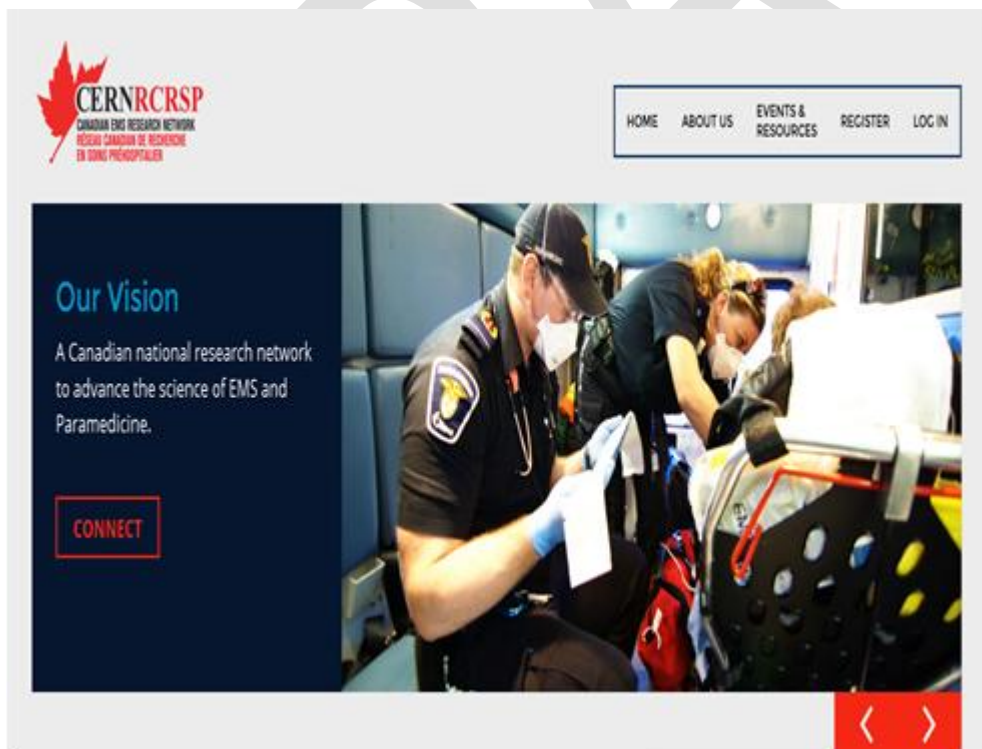
The two day event concluded with a social and networking opportunity in downtown Halifax.

Sponsors

We would like to thank the sponsors of these events including Medusa Medical Technology (Pitch your Proposal sponsor), EMC, EHS, Canadian Paramedicine, Nova Scotia Health Research Foundation, the Dalhousie Bookstore, and Jones & Bartlett.

Canadian EMS Research Network-Réseau canadien de recherche en soins préhospitaliers (CERN-RCRSP)

The Division of EMS serves as the secretariat for the newly formed Canadian EMS Research Network-Réseau canadien de recherche en soins préhospitaliers (CERN-RCRSP). The network was developed by a group of interested individuals from across Canada, in response to the Canadian National EMS Research Agenda recommendation to formalize a network of Canadian EMS researchers. Dr Alix Carter was the first physician co-chair of the network, along with Ian Blanchard as paramedic co-chair from Alberta. Jan Jensen was the first Treasurer. Dr Carter secured seed funding for the network from Capital Health/IWK research services. The Division continues to provide administrative support and a financial infrastructure for the network. CERN-RCRSPs goals are collaboration, knowledge translation, and mentorship. CERN-RCRSP can be found online at <http://cern-rcrsp.ca/> or by contacting admin@cern-rcrsp.ca.



ADVANCING EMS RESEARCH

A research enterprise continually striving for multi-site interprofessional collaboration to advance the science of emergency medical services

Foster a clear and shared vision for priority research in Nova Scotia

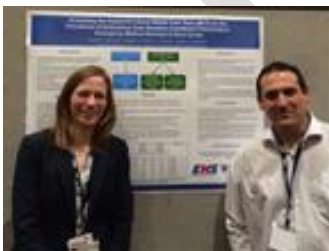
One goal of the Division is to foster a clear and shared vision for priority research in Nova Scotia. The Division, and the Nova Scotia EMS Research program, continues to emphasize research under the pillars:

- System Design topics include Collaborative Emergency Centres, the Offload Zone, provincial cardiac reperfusion strategy, and Palliative Care
- Geriatrics including frailty assessment
- Airway including the King Vision Laryngoscope
- Decision making including learning styles and use of a clinical support desk

This year, Division members were on the study team in 24 studies. Division members were Principal Investigator (PI) on 14 of these studies. Please see a complete listing of active studies in the Appendices. You will also see within these Appendices that paramedics are highlighted in **Blue**, and are often the PI of the studies; interprofessional research is intentional and highly valued.

Division members held 11 active grants this year, totaling \$1,123,746.76. Funding sources were: Capital District Health Authority/Nova Scotia Health Authority, Dalhousie University Faculty of Medicine, Canadian Partnership Against Cancer, Nova Scotia Health Research Foundation, and Canadian Institutes of Health Research. Division members were principal investigator (PI) on 7 of these. (full listing in Appendix B)

During this fiscal year, Division members published 10 peer reviewed abstracts and 19 peer-reviewed journal manuscripts. Division authors are highlighted **bold** and paramedics in **blue**. Division members were first author on 13 of these. (Appendix C)



Division members presented 17 studies locally, 7 nationally and 4 internationally, travelling to the Canadian Association of Emergency Physicians (CAEP) in Ottawa, National Association of EMS Physicians (NAEMSP) in New Orleans, USA and International Liaison Committee on Resuscitation (ILCOR) in Dallas, USA. (Appendix D)

DIVISION PUBLICATIONS

Of 24 active studies with Division members on the team, 22 involved a paramedic and 6 are led by paramedics.

Division members published 10 abstracts and 19 manuscripts this year!

Foster undergraduate and postgraduate medicine interest in EMS research

RIM (Research in Medicine) Students

The Division jointly supported one Med I RIM student in NS: John Bartolacci will work with Dr K. Tennankore from nephrology and with Judah Goldstein on the use of EHS by dialysis patients.

Med II RIM students this year were Madeleine Bohrer who continued to work on her Pediatric Palliative Care Utilization of an EMS Special Patient Program project, and Stewart Whalen (Impact of Working in a

Collaborative Emergency Centre on Paramedic Professional Identity). Stewart completed his interviews and is working on coding the transcripts.

Graduate Students

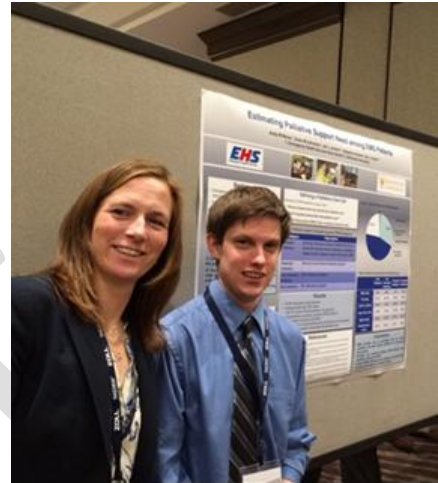
Andy Muise (pictured to the right): Dr Alix Carter and Jan Jensen served on Andy's Master of Health Administration thesis committee (graduation: Spring 2015)

Ben Wedge: Dr Alix Carter serves on Ben's Master of Engineering thesis committee (graduation: Fall 2015)

Aaron DeRosa: Dr Carl Jarvis and Dr Judah Goldstein are mentoring the research for Aaron's Master of Applied Health Services Research. Dr Alix Carter is on the thesis committee. (graduation: Spring 2016)

Steve Carrigan: Dr Alix Carter and Judah Goldstein are serving on his research team and thesis committee for his MSc in Epidemiology. (graduation: Spring 2016)

Ryan Brown: Dr. Alix Carter, Judah Goldstein and Jan Jensen are serving on his research team for his Masters in Public Health from Liverpool University (graduation: November 2015)



Post Doctoral Fellowship

Dr Judah Goldstein joined the Division of EMS as a post-doctoral fellow in February 2014 after completing his PhD under the supervision of Dr Ken Rockwood at Dalhousie University in the Department of Medicine, Geriatrics. Dr Goldstein has now accepted a permanent position with EHS as the Research Coordinator, and continues his program of research in frailty.

Ensure adequate resources for EMS researchers

Division of EMS Research Grants

Ensuring adequate resources for EMS researchers, including funding, is an ongoing goal of the Division. To this end, the Division of EMS bursaries were developed in 2010. The bursaries are to be used to encourage and support research and knowledge translation in EHS/EMS practice, education, systems and safety. There are three types of bursaries offered by the Division of EMS, two of which are in support of the costs of performing/undertaking the direct costs of conducting a study, or translating that knowledge to practice:

The Division of EMS Research Performance grant: Two of these will be awarded annually to offset direct costs of conducting EMS research. A Performance grant can be up to \$5,000 and can be renewed once after submission of a progress report to the Division of EMS.

- **The Performance grant was not awarded this year.**

The Division of EMS Research Knowledge Translation grant is awarded to assist with the costs of presenting original research at a research-based meeting or conference. The presentation may be oral or a poster. The applicant can be the principal investigator or co-investigator of the project. The EMS Research Knowledge Translation grant is worth up to \$3,000. A maximum of \$6,000 can be awarded annually (two grants of \$3,000 each or three grants of \$2,000 each, etc.).

- **Ryan Brown, BSc (Honours), MPH, PCP**

- **Patrick Froese, ACP**
- **Andy Muise, MHA**

The Critical Care Transport grant is available for projects that examine the role of Critical Care Transport within Nova Scotia and the Maritimes. Critical Care Transport is defined by the need to safely move critically ill or injured patients from the scene or healthcare facility to their destination of definitive care. Projects that address current knowledge gaps and have a broad impact and help improve our provincial system for Critical Care Transport will be given preference. The grant has a value of up to \$5,000.

Mentorship

The Division strongly values mentorship and building capacity for the next generation of EMS researchers. Locally, the Division is working to formalize opportunities for mentorship of new researchers, through the Pitch your Proposal session held at EMS Research Day. Up to this point, seeking out mentorship has been more informal, but the completion of several projects and graduate degrees by Nova Scotia paramedics is a testament to their persistence in seeking out those relationships!

Pitch or Propel your Proposal

On Tuesday, October 27th, 2015 the **3rd Annual Pitch or Propel Your Proposal** was held with five paramedic presenters. This session gives the opportunity for experienced or new researchers to present a research idea and get feedback on the methods and design, and potentially offer mentorship to each presenter. Approximately 30 people attended, some of whom were experienced researchers and EMS leaders who came to mentor each presenter on how to improve their proposed study. This event highlighted the diverse array of research interests within our EMS community. Topics included care provision for Trans* populations, an evaluation of blood draws performed by paramedics in the Emergency Department, and mental healthcare in EMS. Thank you to everyone who participated and also to those who *pitched* great ideas!

Nova Scotia EMS Research Steering Committee

It is the Division's goal to chair an active and engaged Nova Scotia EMS Research Steering Committee. EMS Research in Nova Scotia is conducted jointly through the partnership of the Division of EMS, EHS Nova Scotia, and EHS Ambulance Operations. This collaboration is a key element in our ongoing success. These partners come together at the EMS Research Steering Committee, which meets the first Wednesday of every other month. The steering committee reviews all protocols prior to Research Ethics submission, and provides feedback to ensure operational feasibility, and the answerability of the research question in our Nova Scotia system. The steering committee also oversees the awarding of bursaries to conduct and present EMS research.

The Committee, and the Division, continue to work to reduce systematic challenges in EMS research, working with the Research Ethics Board, privacy legislation, issues of data linkage and others as they arise.

This year, the committee has welcomed a new member, Elizabeth Iwaskow, privacy officer at the Department of Health and Wellness, in support of the EHS Data Access Review component of the work of the Committee. The Committee has long had the role of shepherding access to EHS data and people, through review for workload, operational impact, and even the existence of the requested data. Now with the introduction of PHIA legislation,

requests for EHS data must undergo additional formal review from a privacy perspective, which the Committee will now undertake.

The Committee has worked with other Data Access Committees in the province to streamline processes for privacy review and overall.

Members

- Medical Director, Provincial Critical Care Transport Program: **George Kovacs**
- Medical Director, Provincial Trauma Program: **Rob Green or Mete Erdogan**
- Medical Director of Research, EHS: **Alix Carter**
- Director, Division of EMS: **Alix Carter**
- Research Director, Department of Emergency Medicine, Dalhousie University: **Kirk Magee**
- Research Manager, Department of Emergency Medicine, Dalhousie University: **Corinne DeMone**
- Paramedic Research Coordinator, EHS: **Judah Goldstein**
- Knowledge Translation Paramedic Coordinator, Division of EMS: **Jennifer Greene**
- Performance Manger, EHS Operations Performance and Development: **Jan Jensen**
- Medical Director, NSHA Emergency Preparedness: **Carl Jarvis**
- Paramedic School Representatives (Medavie/Holland College): **Karl Kowalchuk/Brent Nicholson**
- Privacy Office, Department of Health and Wellness: **Elizabeth Iwaskow**
- Recording Secretary: **Melissa MacDougall**

Increase critical mass of the Division

This year the Division welcomed 2 new members and now regularly includes members from Prince Edward Island at Division meetings. The Division also put forward Ryan Brown for appointment to Dalhousie University Department of Emergency Medicine.

Encourage and support paramedics to publish and present

Although this goal is over-arching and can be seen in many places throughout the activities of the Division, the specific goals for this year were to offer increased support to Critical Care, Communications Centre, and Emergency Department Paramedics, which was seen to be an area for improvement for the Division. The work on the Clinical Support Desk actively engages the Communications Centre, and a Critical Care study was “pitched” during the Pitch or Propel your Proposal session. The Emergency Department paramedics

EDUCATING EMS LEADERS

A nationally recognized centre for education of leaders in emergency medical services

Ensure the Division has a voice at the national level

Division members also have an impact at the local, national, and international level through participation in committee work.

Alix Carter: Canadian Journal of Emergency Medicine (CJEM) Decision Editor and guest editor for EMS Series, Canadian Medical Association accreditation team chair, CAEP EMS Committee Chair, NAEMSP Research Committee chair, CERN-RCRSP co-chair, in addition to chairing Division committees as noted

Jan Jensen: CERN-RCRSP treasurer, ILCOR evidence review

Pat Froese: Low back pain advisory group and Emergency Department Research Committee

George Kovacs: Lifeflight Medical advisory, Lifeflight quality improvement and Central zone simulation operational advisory

Judah Goldstein: Emergency Department Frailty Committee, CAEP Research Committee, CAEP Geriatrics Committee

Ryan Brown: EHS - Cape Breton Region Medical Oversight Committee (CHAIR), Provincial Clinical Practice Guidelines Committee, Cape Breton District Health Authority Acute Myocardial Infarction Committee, Cape Breton Paramedic Conference Committee

Andrew Travers: Delegate/Member – International Liaison Committee on Resuscitation, Co-Chair – Basic Life Support Taskforce Committee, ILCOR Science Evidence Evaluation and Review System, Member, American Heart Association, Emergency Cardiac Care: Systems Subcommittee, Faculty Member, National Association of EMS Physicians: Medical Director Course, Emergency Medical Services Advisory Group, Canadian Best Practices Recommendations for Stroke Care, Canadian Stroke Network, Heart and Stroke Foundation (2012 – present), Surveyor, Canadian Medical Association Accreditation Committee Paramedic Programs, numerous provincial committees as provincial medical director for EHS

Educating paramedics in evidence-based practice

The Paramedic Evidence-Based Practice (P-EBP) course is now delivered in two formats. Previously the Division offered only an 8-hour in-person course, meeting the Paramedic Association of Canada National Occupational Competency Profile (NOCP) research requirements for the advanced care paramedic level. In

Division members making impact

Division members participate in local/provincial committees for protocol development, safety, and medical oversight.

Division members also have influence at the national level, shaping national conferences, accreditation, and publication of journals.

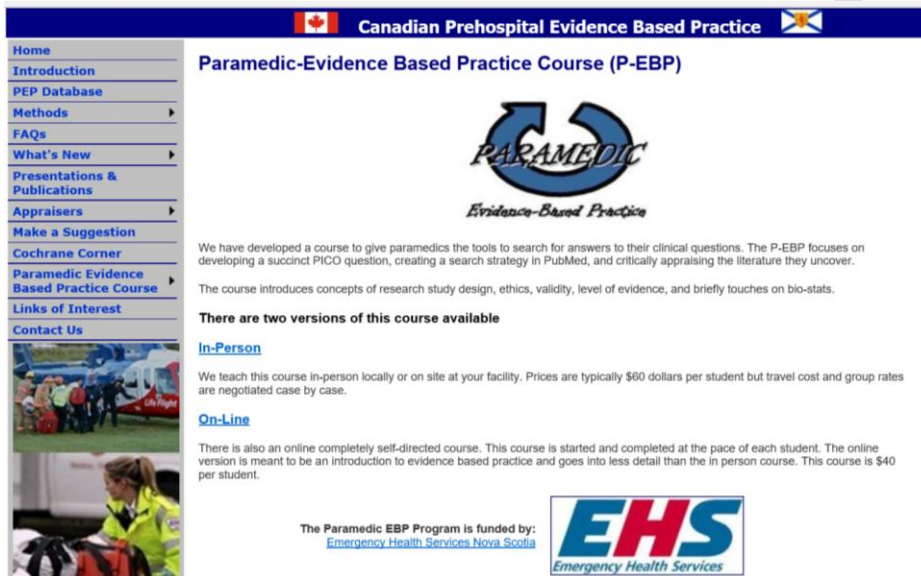
At the international level, Division members shape cardiovascular care guidelines, international conferences, and innovation in models of care and simulation.

January of 2015, in response to demand from across Canada and a few requests for travel to the USA to deliver the course, an online delivery format was launched. The online course meets the Paramedic Association of Canada NOCP research requirements for the primary care paramedic.

There were 2 in-person courses taught during the time period, with a total of 28 students. These were a mix of independent courses requested by interested paramedics, and courses taught for the Medavie HealthEd paramedic program to satisfy the requirements for graduation.

Goals for the P-EBP course during this time include formalizing a teaching relationship with Medavie HealthEd and Holland College.


The online P-EBP course has a rolling enrollment, with 24 students having enrolled for the course by the end of the fiscal year.



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Canadian Prehospital Evidence Based Practice

Paramedic-Evidence Based Practice Course (P-EBP)



We have developed a course to give paramedics the tools to search for answers to their clinical questions. The P-EBP focuses on developing a succinct PICO question, creating a search strategy in PubMed, and critically appraising the literature they uncover.

The course introduces concepts of research study design, ethics, validity, level of evidence, and briefly touches on bio-stats.

There are two versions of this course available


In-Person

We teach this course in-person locally or on site at your facility. Prices are typically \$60 dollars per student but travel cost and group rates are negotiated case by case.

On-Line

There is also an online completely self-directed course. This course is started and completed at the pace of each student. The online version is meant to be an introduction to evidence based practice and goes into less detail than the in person course. This course is \$40 per student.

The Paramedic EBP Program is funded by:
[Emergency Health Services Nova Scotia](#)



<https://emspep.cdha.nshealth.ca/ParamedicEBPCourse.aspx>

Develop Exemplary EMS Leaders

The curriculum for medical student through to fellowship-level EMS rotations follows a graded responsibility model and is consistent with the national standard. (Macdonald et al. Prehosp Emerg Care. 2008 Jul-Sep;12(3):372-80).

MED I Student EMS Elective

In response to a student-led proposal, work is ongoing to launch a longitudinal EMS elective for MED I students. This is currently submitted to the Med I Curriculum Committee.

MED IV Student EMS Elective

This was not filled during this fiscal year.

CCFP-EM EMS Rotation

CCFP-EM residents were offered an EMS experience beginning in 2015. Though this does not fully mirror the national curriculum, it is an exposure to EMS which was not previously available to these residents.

FRCP EMS Core Rotation

This year 4 Royal College residents (John Armstrong, Heather Flemming, Adam Harris, Sam Jang-Stewart) completed their core EMS rotation. They were all able to experience ground and Lifelight field experience, Extended Care Paramedic, and Collaborative Emergency Centre observation. All enjoyed their rotations and provided insightful feedback for PEP and clinical practice guidelines in their case presentations. Residents were able to provide online medical oversight teleconferenced with staff online physicians.

Visiting EMS Resident Elective

Dr Patrick Fok (McGill PGY5) spent a month (June 2015) with EHS, during which time he did ride alongs with ground, ECP and LifeFlight, spent time at CEC, met with EMS supervisor to discuss core EMS objectives, attended EMS leadership meetings, presented an excellent review of a case seen during his ride alongs with a review of interesting recent research. As Dr Fok had previously completed his core EMS objectives, the content of this experience was tailored to his specific interests.

Pediatric Emergency Resident EMS Rotation

Katie Gardner completed her core EMS rotation with the Royal College emergency medicine core residents. She also experienced ground and Lifelight, Extended Care Paramedic, and Collaborative Emergency Centre practice environments, and reflected on clinical practice guideline development, the PEP database, and EMS practice.

EMS Fellows & Subspecialty Residents

Post-residency fellows work as attending staff in the emergency department at the QE II Health Science Centre in Halifax. The *Division* continues to work with Post-Graduate Medical Education on opportunities for international trainees to complete a fellowship as well. Those residents who complete a core period (at least 6 months) of structured rotations in EMS are considered to be Sub-specialty residents in EMS and are funded through their resident salary. At the fellow and sub-specialty resident level, it is possible to have increased involvement in online medical oversight, protocol development, and other leadership activities within EHS.

This year the Division hosted Dr Yves Leroux, a PGY 4 Emergency Medicine Resident from Dalhousie, in the completion of a subspecialty in EMS. Dr Leroux worked on clinical practice guidelines with a pediatric focus, reviewed literature for PEP, did ride alongs ground, air, ECP & with pediatric teams, provided online coverage with staff backup, presented an M&M case locally to HRM paramedics, started work on a research project with a unique focus, Pediatric transfers, for which there is very little research.

Dr Kirstin Moritz completed her EMS Fellowship with the Division in October 2015. She is currently Emergency department staff at Hants Community Hospital and continues to provide online medical control for EHS. While in her fellowship, Dr Moritz completed the EHS OBGYN CPG, provided online medical control for EHS, and started a project focusing on Superusers of EMS system.

Previous fellows: Dr Jolene Cook 2012-2013, previous subspecialty resident Dr Rose Mengual 2010.

The Division continues to support the national application for accreditation of EMS as a diploma subspecialty of Emergency Medicine by the Royal College.

Paramedic bursary for post-graduate education

The Division of EMS bursaries were developed in 2010. The purpose of the bursaries is to support the mission of the Division. In particular, the bursaries are to be used to encourage and support research and knowledge translation in EHS/EMS practice, education, systems and safety. There are three types of bursaries offered by the Division of EMS, one of which directly supports the payment of tuition and fees for a paramedic undertaking graduate studies:

The Division of EMS Research Postgraduate Education Bursary is awarded once a year to a paramedic accepted in a Masters or PhD program at a recognized institution. An amount up to \$3,000 per year for a maximum of two years is available to assist with tuition costs.

- **Aaron DeRosa, a Nova Scotia paramedic, received the bursary this year toward completion of his Master of Applied Health Services Research, hosted by St Mary's University.**

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Dr. Nigel Merchant Allied Health Bursary

Nigel was an Emergency Physician at the Victoria General Hospital in Halifax, and later the QEII Health Sciences Centre, from 1975 until 2002. He served as Chief of the Emergency Department from 1977-1980. Nigel lost his life in a car crash at the age of 58 in 2002. Nigel was a colleague, a business associate but most of all, he was a friend. His is survived by his wife Joyce and their three children – Clark, Sara and Lee.

- **Celina Marshall, ACP PEI**
- **Chelsea Crowell, Medical Lab Technician Training**

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APPENDIX A: ACTIVE STUDIES

In the tables that follow, Division members are highlighted **bold** and paramedics are blue.

Frailty assessment of older Canadians using emergency services with tablet technology (FOCUS-TT).	Goldstein, J
Assessment of Extremity Injuries by Advanced Care Paramedics to Determine the Need for Diagnostic Imaging.	Froese P, MacKinley R, Magee K, Campbell S.
Blade Tip Location to Facilitate Endotracheal Intubation Using the King Vision Video Laryngoscope: A Randomized Trial Using Mannequins and Lightly Embalmed Cadavers.	Myers T, Froese P, Law A, Kovacs G.
After-hours Collaborative Emergency Centres in Nova Scotia: Bounce-back rate and resource utilization model.	Carter A, White C, Latta R, Northcott C, Dobson T, Carrigan S, Vanberkel P, Cook J, Travers A, Jensen J, Johnston T.
Epidemiology of Prehospital Geriatric Emergency Responses in a Provincial EMS System.	Goldstein J, Travers A, Jensen J, Carter A, Rockwood K.
Feasibility of a novel prehospital geriatric frailty assessment.	Rockwood K, Goldstein J, Travers A.
Ground Ambulance Paramedic Clinical Consults with a Clinical Support Paramedic or Nurse in an EMS Communications Centre Compared to Traditional EMS Physician Consults.	Jensen J, Travers A, Hawco T, Butts F, Rose P, McVey J, Rose J, Carter A, Al-Dahlaan F.
Identification of ST Elevation Myocardial Infarction by Paramedics: A Systematic Review.	Loubani O, Travers A, Jensen J, Deveau B, McVey J.
Integrating Emergency Health Services and Palliative Care to Enhance the End of Life Experience for Nova Scotia and Prince Edward Island Cancer Patients and Their Families.	Carter A, Arab M, Lecours M, Goldstein J, Houde K, Sullivan J.
Learning Style Preferences in Continuing Medical Education Activities of Nova Scotia Paramedics: A Pilot Study.	Staple L, Carter A, Walker M, Jensen J.
Outcomes of Provincial Cardiac Reperfusion Strategy: A Population-Based, Retrospective Cohort Study.	Cook J, Swain J, Jensen J, Carter A, Brown R, Cain E, Travers A.
Temperature and Humidity of Medications Stored in EMS Ambulances and Bases Throughout the Province.	Stewart P, Jensen J, Deveau B, Agu R.
The Impact of Collaborative Emergency Centres on Ambulatory Care Sensitive Condition Emergency Department Visits in Cumberland County.	Conrad J, Carter A.
The Offload Zone as a Solution to EMS Offload Delay in the Emergency Department.	Carter A, Vanberkel P, Jensen J, Fraser J, Wheatley M, Cook J, Carrigan S, Petrie D, Travers A.

The Prevalence and Characteristics of Non-Transported Patients in Nova Scotia.	Carrigan S, Travers A , Carter A , Goldstein J , Asada Y.
The Use of Machine Learning Algorithms to Aid in Clinical Diagnosis.	Butler M, Carter A .
Understanding Offload Delay: An Exploration of the Role of Delivery and Recovery Intervals, and Environmental Factors.	Carter A , Terashima M, Wheatley M , Travers A , Carrigan S.

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APPENDIX B: GRANTS

In the tables that follow, Division members are highlighted **bold** and paramedics are **blue**.

Granting Agency	Project Title	Research Team Members	Amount
CDHA	Assessment of Extremity Injuries by Advanced Care Paramedics to Determine the Need for Diagnostic Imaging.	Froese P , MacKinley R, Magee K , Campbell S.	\$7,440
CDHA	Blade Tip Location to Facilitate Endotracheal Intubation Using the King Vision Video Laryngoscope: A Randomized Trial Using Mannequins and Lightly Embalmed Cadavers.	Myers T, Froese P , Law A, Kovacs G .	\$4,980
Dalhousie FOM	Ground Ambulance Paramedic Clinical Consults with a Clinical Support Paramedic or Nurse in an EMS Communications Centre Compared to Traditional EMS Physician Consults.	Jensen J , Travers A , Hawco T , Butts F , Rose P , McVey J , Rose J , Carter A , Al-Dahlaan F.	\$5,000
Canadian Partnership Against Cancer	Integrating Emergency Health Services and Palliative Care to Enhance the End of Life Experience for Nova Scotia and Prince Edward Island Cancer Patients and Their Families.	Carter A , Arab M, Sullivan J.	\$1,019,325
NSHRF	Local Implementation of the Recommendations from the Canadian national EMS Research Agenda	Jensen J , Carter A .	\$9,662.50
CDHA	Outcomes of Provincial Cardiac Reperfusion Strategy: A population-based, retrospective cohort study.	Cook J , Swain J , Jensen J , Carter A , Brown R , Cain E , Travers A .	\$14,830
NSHRF	Paramedic Clinical Decision Making Workshop: Thinking About Thinking.	Walker M , Jensen J , Travers A .	\$9,794.26
CIHR	The Canadian EMS Data Project (Cardiac Arrest)	Carter A , Morrison L, Jensen J , Blanchard I , Segal E.	\$24,920
Dalhousie RIM	The Impact of Collaborative Emergency Centres on Ambulatory Care Sensitive Condition Emergency Department Visits in Cumberland County.	Conrad J, Carter A .	\$5,000
CDHA	The Offload Zone as a Solution to EMS Offload Delay in the Emergency Department.	Carter A , Vanberkel P, Jensen J , Fraser J , Wheatley M , Cook J , Carrigan S , Petrie D , Travers A .	\$14,995
CDHA	The Use of Machine Learning Algorithms to Aid in Clinical Diagnosis	Butler M, Carter A .	\$4,800
TOTAL*			\$1,123,746.76

*since Annual Report of 2012-13

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Appendix C: PUBLICATIONS

In the tables that follow, Division members are highlighted **bold** and paramedics are **blue**.

Peer-Reviewed Abstracts

Jensen J, Reilly M, Singletary E, Zideman D. Tourniquet application for limb bleeding. A systematic review using GRADE methodology. PEC 20(1).

Brown R, Carter A, Goldstein J, Jensen J, Travers A, Dobson T, Cosgrove P. Evaluating the impact of a novel mobile care team (MCT) on the prevalence of ambulatory care sensitive conditions presenting to emergency medical services in Nova Scotia. PEC 20(1).

Carter A, Goldstein J, Arab M, Harrison M, Crowell W, **Houde K, Jensen J**, Downer K. Paramedics providing palliative care at home: An evaluation of paramedic comfort and confidence in providing palliative support. NAEMSP 2016

Carter A, DeRosa A, **Goldstein J, Greene J, Cook J, Jensen J, Swain J**, Fidgen D, Muise A, **Cain E**. State of the evidence for emergency medical services (EMS) provision of palliative care: An analysis of appraised research from the Canadian Prehospital Evidence-Based Practice (PEP) Project. PEC 20(1).

Muise A, **Carter A, Jensen J**, Karim S, Johnston G. Estimating palliative support need among EMS patients. PEC 20(1).

Goldstein J, Rockwood K. Listening to care partners: A feasible method to screen for frailty in emergency medical services? PEC 20(1).

Deveau B, Stewart P, **Greene J, Jensen J**. Temperature control of medications in the EMS setting: a scoping review. CJEM 2015; 17(S2):S60

Goldstein J, Jensen J, Carter A, Travers A, Rockwood K. Epidemiological profile of emergency medical services use by older adults with cognitive impairment in a provincial EMS system. CJEM 2015; 17(S2):S60

Carter A, Jensen J, Greene J, Cook J, Goldstein J, Swain J, Fidgen D, Richardson L, **Cain E**. State of the evidence for emergency medical services (EMS) care of respiratory distress: an analysis of appraised research from the Canadian prehospital evidence-based practice (PEP) project. CJEM 2015; 17(S2):S56

Deveau B, Stewart P, **Jensen J**, Agu R. Feasibility of Monitoring real-time temperatures of medications in a ground ambulance system: a pilot study. CJEM 2015; 17(S2):S60

Articles

Green R, Travers A, Cain E, Campbell S, **Jensen J**, Petrie D, **Erdogan M**, Patrick G, Patrick W. Paramedic recognition of sepsis in the prehospital setting: A prospective observational study. Emerg Med Int 2016; 20161-5

Goldstein J, McVey J, Ackroyd-Stolarz S. The role of emergency medical services in geriatrics: Bridging the gap between primary and acute care. CJEM 2016; 18(01):54-61

Singletary E, Charlton N, Epstein J, Ferguson J, **Jensen J**, MacPherson A. Part 15: First Aid: 2015 American

Heart Association and American Red Cross Guidelines update for First Aid. *Circulation* 2015; 132(18S2):S574-89

[Travers A.](#) et al. Cardiac Arrest and Cardiopulmonary Resuscitation Outcome Reports: Update of the Utstein Resuscitation Registry Templates for Out-of-Hospital Cardiac Arrest. *Resuscitation* 2015; 96:328-40

Singletary E, Zideman D, De Buck E, Chang W, [Jensen J](#), [Swain J](#). Part 9: First Aid: 2015 International Consensus on First Aid Science with treatment recommendations. *Circulation* 2015; 132(16S1):S269-311

[Travers A.](#) et al. Part 3: Adult basic life support and automated external defibrillation: 2015 international consensus on cardiopulmonary resuscitation and emergency cardiovascular care science with treatment recommendations. *Circulation* 2015; 132(16S1):S51-83

[Travers A.](#) et al. Part 2: Evidence evaluation and management of conflicts of interest: 2015 international consensus on cardiopulmonary resuscitation and emergency cardiovascular care science with treatment recommendations. *Circulation* 2015; 132(16S1):S40-50

Sowers N, [Froese P](#), [Erdogan M](#), Green R. Impact of the age of stored blood trauma patient mortality: a systematic review. *Can J Surg* 2015; 58(5):335-42

Zideman D, Singletary E, De Buck E, Chang W, [Jensen J](#), [Swain J](#). Part 9: First Aid: 2015 International Consensus on First Aid Science with Treatment Recommendations. *Resuscitation* 2015; 225-61

[Travers A.](#) et al. Executive summary: 2015 International consensus on cardiopulmonary resuscitation and emergency cardiovascular care science with treatment recommendations. *Resuscitation* 2015; 95:e1-31

[Travers A.](#) et al. Part 3: Adult basic life support and automated external defibrillation: 2015 international consensus on cardiopulmonary resuscitation and emergency cardiovascular care science with treatment recommendations. *Resuscitation* 2015; 95:e43-69

[Travers A.](#) et al. Part 2: Evidence evaluation and management of conflicts of interest: 2015 international consensus on cardiopulmonary resuscitation and emergency cardiovascular care science with treatment recommendations. *Resuscitation* 2015; 95:e33-41

[Travers A.](#) et al. Cardiac Arrest and Cardiopulmonary Resuscitation Outcome Reports: Update of the Utstein Resuscitation Registry Templates for Out-of-Hospital Cardiac Arrest. *Circulation* 2015; 132(13):1286-300

[Goldstein J](#), [Jensen J](#), [Carter A](#), [Travers A](#), Rockwood K. The epidemiology of prehospital emergency responses for older adults in a provincial EMS system. *CJEM* 2015; 17(5):491-6

[Jensen J](#), Marshall E, [Carter A](#), Boudreau M, Burge F, [Travers A](#). Impact of a Novel Collaborative Long-Term Care - EMS Model: A Before-and-After Cohort Analysis of an Extended Care Paramedic Program. *PEC* 2015

Shuster M, [Travers A](#). Part 1: Executive Summary 2015 American Heart Association guidelines up for cardiopulmonary resuscitation and emergency cardiovascular care. *Circulation* 2015; 132(16S1):S2-39

[Travers A.](#) et al. Part 4: Systems of care and continuous quality improvement 2015 American Heart Association of Guidelines update for cardiopulmonary resuscitation and emergency cardiovascular care. *Circulation* 2015; 132(S2):S397-413

Travers A. et al. Part 5: Adult basic life support and cardiopulmonary resuscitation quality 2015 American Heart Association Guidelines update for cardiopulmonary resuscitation and emergency cardiovascular care. *Circulation* 2015; 132(S2):S414-35

Brooks S, Travers A. et al. Part 6: Alternative techniques and ancillary devices for cardiopulmonary resuscitation 2015 American Heart Association guidelines update for cardiopulmonary resuscitation and emergency cardiovascular care. *Circulation* 2015; 132(S2):S436-43

Accepted For Publication

Peer Reviewed

Article

Jensen J, Bienkowski A, Travers A, Calder L, Walker M, Tavares W, Croskerry P. A survey to determine decision- making styles of working paramedics and student paramedics. *CJEM* 2016; 1-10

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Appendix D: PRESENTATIONS

Local

26-Oct-15	Time Savings and Accurate Recognition with Use of Stroke Assessment Scales by First Aid and EMS Providers: An Evidence Review Using GRADE Methodology.	Jensen, J
26-Oct-15	Listening To Care Partners: A Feasible Method to Screen for Frailty in Emergency Medical Services?	Goldstein, J
26-Oct-15	Evaluating the impact of a novel care delivery mobile care team (MCT) on the prevalence of ambulatory care sensitive conditions presenting to Emergency Medical Services in Nova Scotia.	Brown, R
26-Oct-15	State of the Evidence for Emergency Medical Services (EMS) Provision of Palliative Care: An Analysis of Appraised Research from the Canadian Prehospital Evidence-based Practice (PEP) Project.	Greene, J
26-Oct-15	Outcomes of a Provincial Cardiac Reperfusion Strategy: A Population-based, Retrospective Cohort Study.	Cook, J
26-Oct-15	An Evaluation of Paramedic Comfort and Confidence in Providing Palliative Support.	Carter, A
11-May-15	The state of evidence for EMS respiratory care.	Greene, J

National

01-Feb-16	Accurate recognition of stroke by first aid and EMS providers using stroke assessment scales: an evidence review using GRADE methodology.	Jensen J
01-Feb-16	Severe external bleeding: The evidence behind the recommendations.	Jensen J
05-Jun-15	Epidemiological profile of emergency medical services use by older adults with cognitive impairment in a provincial EMS system.	Goldstein J
05-Jun-15	The state of evidence for emergency medical services (EMS) care of respiratory distress: an analysis of appraised research from the Canadian prehospital evidence-based (PEP) project.	Carter A
05-Jun-15	Temperature control of medications in the EMS settings: a scoping review.	Deveau B, Greene J
05-Jun-15	Feasibility of monitoring real-time temperatures of medications in a ground ambulance system: a pilot study.	Deveau B, Greene J
30-May-15	The state of evidence for EMS respiratory care.	Greene J

International

11-Jan-16	Tourniquet application for limb bleeding. A systematic review using GRADE methodology	Jensen J
11-Jan-16	Evaluating the impact of a novel mobile care team (MCT) on the prevalence of ambulatory care sensitive conditions presenting to emergency medical services in Nova Scotia.	Brown R
11-Jan-16	Paramedics providing palliative care at home: An evaluation of paramedic comfort and confidence in providing palliative support.	Carter A
11-Jan-16	State of the evidence for emergency medical services (EMS) provision of palliative care: An analysis of appraised research from the Canadian Prehospital Evidence-Based Practice (PEP) Project.	Carter A
11-Jan-16	Estimating palliative support need among EMS patients.	Muise A
11-Jan-16	Listening to care partners: A feasible method to screen for frailty in emergency medical services?	Goldstein J

Appendix E: EXPENDITURES REPORT

Dalhousie University Division of EMS Expenditures Report	April 1, 2015 – March 31, 2016
Expenditures	Amount
PEP Database	\$1000.00
Infrastructure:	\$32,598.00
• Computer Leases	
• Printing Services	
• Telephones (In Kind)	
• Stationery	
• Admin Support KT Program	
Research Day	\$1252.82
Research Dissemination Bursary	\$236.88
Education Post Grad Bursary	\$3000.00
EMS Research Performance Bursary	\$.000
Discretionary Fund	\$817.15
Total Expenditures	\$38904.85