Department of
Critical Care Medicine
Calgary

2019 Annual Report

Alberta Health Services

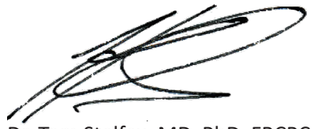
UNIVERSITY OF CALGARY

Message from the Department Head

I'm pleased, on behalf of my colleagues, to present our department's annual report. Our report details important work and accomplishments. We are a clinical and academic department where clinical programs, education, and research are seamlessly integrated to provide critically ill patients with exceptional patient and family centred-care. Our greatest resource are our people who are dedicated to the service of others. This report outlines some of the challenges we have collective managed as well as select accomplishments. Notable events from the past year include:

- Development of a 2019-2024 strategic plan.
- Preparations for and management of critically ill patients with Covid-19
- Implementation of a plan to decouple intensivist nighttime coverage of the SHC and RGH ICUs
- Submission of a clinical ARP application to Alberta Health for the RGH, SHC and PLC ICUs
- Relaunch of a clinical scholar program

Departmental members continue to lead critical care through their commitment to clinical care, education and research producing exceptional patient-and-family-centered care.



Dr. Tom Stelfox, MD, PhD, FRCPC

DCCM Strategic Plan

Focus Area:
CLINICAL CARE

Goal:

Exceptional patient care that uses best practices to optimize patient health outcomes.

Objective:

Develop a framework for quality management.

Activites:

1. Identify the needs of patients and the critical care team to optimize patient care and co-develop metrics to measure performance.

2. Develop a strategy to align clinical guidelines, pathways and performance metrics with current and future clinical information systems.

Targets:

Develop clinical metrics by July 2020.

2019 2020 2021 2022 2023 2024

Develop and implement a clinical care review & feedback strategy by July 2021.

Focus Area:
EDUCATION

Goal #1:

Successful transition of critical care medicine residency program to Competence By Design(CBD).

Objective:

Successful implementation of CBD transition plan.

Activites:

1. Train all physicians on the fundamentals of CBD and support them during the transition.

2. Evaluate effectiveness of the CBD program.

Targets:

Implement physician development sessions by July 2019.

2019 2020 2021 2022 2023 2024

Develop a local CBD evaluation plan by July 2020.

Develop & implement CBD metrics by July 2020.

Goal #2:

Professional development to support DCCM members pursuit of excellence.

Objective:

Continuous growth and development of members.

Activites:

1. Solicit feedback to inform professional development opportunities.

2. Establish expectations for participation in professional development activities.

3. Foster a culture of growth.

4. Incorporate educational activities into the accountabilities of all physicians and CSM faculty.

Targets:

Develop a plan to increase coaching and mentorship capacity by July 2020.

2019 2020 2021 2022 2023 2024

Professional growth plans are developed & reviewed regularly (yearly for physicians & CSM faculty).

DCCM Strategic Plan (continued)

Focus Area:
RESEARCH

Goal #1:

Increase interdisciplinary research infrastructure.

Objective:

Maximize impact of departmental investments in research.

Activites:

1. Complete implementation of existing DCCM Clinical Research Strategic Plan.
2. Develop and implement a framework for prioritizing investments in research that leverage existing departmental strengths##.
3. Establish research fund development strategy.
4. Support interprofessional research collaborations across departmental sites.

Goal #2:

Increase member capacity for research.

Objective:

Capacitate members to engage in research.

Activites:

1. Incorporate research activities into the accountabilities of all physicians and CSM faculty.
2. Encourage development of interdisciplinary research teams with synergistic interests and expertise.
3. Develop an interdisciplinary research training strategy.

Targets:

* Number of publications with at least one DCCM member in the authorship list (no double counting for multiple DCCM authors)
^ Grant funding awarded to DCCM members as Nominated Principal Investigator or Principal Investigator (no double counting for multiple DCCM members)
# Involvement in research spans a spectrum from identifying eligible patients, consenting eligible patients, being site Principal Investigator, to being a study Principal Investigator.
Immunology/inflammation, neurocritical care, medical education, health services research and recovery from critical illness.

Focus Area:
LEADERSHIP

Goal:

Develop a Just Culture.

Objective:

Provide leadership and support for a Just Culture.

Activites:

1. Leadership communication to all members that patient and staff safety is a departmental priority.
2. Discuss quality of care at every ICU executive meeting and at unit meetings.

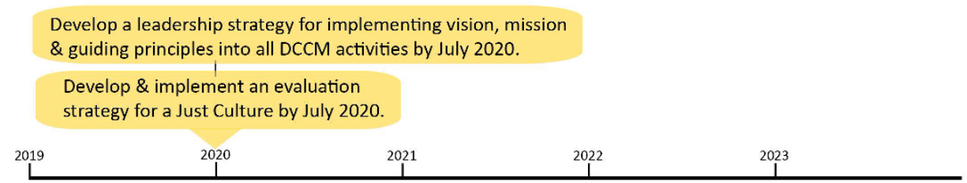
Objective:

Align all quality assurance activities with Just Culture principles.

Activites:

1. Educate all members on the principles of Just Culture and their application to the department.
2. Task the Quality Assurance Committee to champion Just Culture principles that includes patient and team perspectives.

Targets:



2 AHS Just Culture philosophy supports an environment where everyone feels safe, encouraged, and enabled to discuss quality and safety issues where reporting and learning are key elements. This means that reporting is conducted within a psychologically safe environment where there is demonstrated respect and support for the individual, and the potential for human and systems fallibility is acknowledged. Everyone can trust that those within the organization will demonstrate, through their behaviours and decisions, a fair and consistent approach to responding to issues raised.

Our Vision

Healthy Albertans.
Healthy Communities.
Together.

Our Mission

To provide a patient-focused, quality health system that is accessible and sustainable for all Albertans.

Our Values

compassion — We show kindness and empathy for all in our care, and for each other.

accountability — We are honest, principled and transparent.

respect — We treat others with respect and dignity.

excellence — We strive to be our best and give our best.

safety — We place safety and quality improvement at the centre of all our decisions.

U of C Strategy

The University of Calgary is a global intellectual hub located in Canada's most enterprising city. In this spirited, high-quality learning environment, students will thrive in programs made rich by research, hands-on experiences and entrepreneurial thinking. By 2022, we will be recognized as one of Canada's top five research universities, fully engaging the communities we both serve and lead.

Our Eyes High strategic plan drives our institution at the highest level, and we report on our progress to our community every year through our Community Report. Whether it's our overall direction, our foundational commitments or areas important to our community, such as sustainability and mental health, we have well-articulated plans developed through consultation with our community that help us progress towards our goals.

U of C Values

Balance
Collaboration
Curiosity
Excellence
Globalization
Support
Sustainability

Values

Department of
Critical Care Medicine
Calgary

DCCM Vision

Exceptional patient-and-family-centered critical care.

DCCM Mission

We lead critical care medicine through our commitment to clinical care, education and research.

Our definition of critical care excellence is: best clinical outcomes, exceptional patient and family experience and zero preventable patient and staff harm.

AHS Values within the DCCM

collaboration — Multidisciplinary teamwork is evident in our clinical care, education and research

accountability — Clear expectations and regular feedback.

respect — DCCM is regarded by members to be a great place to work. We model professionalism.

excellence — Nationally recognized for clinical care, education and research.

safety — We report near misses and adverse events and focus on system improvement.

New Website

Over the next few years the annual report content will be migrated to the Department of Critical Care Medicine's external website. We have started the process this year with member profiles, unit information, and additional resources. This website will continue to develop over time to ensure that is it a public resource.

Accessing QR Code Content:
There are a few options for this;

1. Open/install a QR Code reader, scan the QR code
2. Use your phone camera as many have the ability to "scan" and link to the content from the camera

New External Site

QR Codes
=
Additional content on the
new external website

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Awards & Recognitions

Recognitions

Dr. Philippe Couillard, **Dr. Andreas Kramer** and **Dr. Julie Kromm** all received Diplomates in Neurocritical care from the United Council of Neurologic Subspecialties.

The RCPSC NACES Course was held for the first time this summer in Calgary. Led by **Dr. John Kortbeek** and included **Dr. Amanda Roze des Ordons**, and **Dr. Paul Boiteau** serving as local faculty. The Critical Care ultrasound course was also held at the same time with **Dr. Andre Ferland**, and **Dr. Jason Waechter** serving as local faculty.

Dr. Paul Boucher has been named the AMA President-Elect for 2019-20. He has a long history of service the AMA having served on the Board of Directors for eight years, as well as on numerous committees. We look forward to his leadership over the next three years.

Dr. Kirsten Fiest, **Dr. Tom Stelfox** and **Dr. Dan Zuege**, among many others, were nominated for the 2019 President's Excellence Award for Outstanding Achievement in Quality Improvement for the Provincial Intensive Care Unit (ICU) Delirium Initiative Team.

Critical Care Medicine Teaching Awards

- **Dr. Andreas Kramer** -Dean Sandham 2018 Clinical Teaching award
- **Dr. Amanda Roze des Ordons** -2018 Rotating Resident Teacher of the Year Award
- **Dr. Daniel Niven** -2018 Research Mentor Award
- **Dr. Mitesh Thakrar** (Respiratory)-2018 Off-Service Preceptor of the Year Award
- **Dr. Juan Posadas**- 2018 Outstanding Physician of the Year award. In recognition of excellent medical/clinical expert, advocate for patients, scholarly Knowledge, professionalism and leadership and excellence in communication and collaboration.
- **Dr. Kirsten Fiest** was selected for the Peak Scholar for 2019 for her work engaging patients as partners in critical care medicine research.
- **Dr. Dan Niven** was awarded the 2019 GREAT supervisor award for Community Health Science for demonstrating exceptional mentorship and supervision of graduate students.

Congratulations to all the 2019 recipients

UME Teaching awards

A number of faculty are recipients of awards within UME (demonstrating our collective impact and commitment). As a department, we are punching above our weight.
Here are the most recent awards in alphabetical order:

Dr. Selena Au
- Internal Medicine Clerkship Teaching Award – Honourable Mention

Dr. Luc Berthiaume
- Associate Dean's Letter of Excellence of Small Group Teaching
- Associate Dean's Letter of Excellence for Clinical Core
- Platinum Award for Teaching
- Pre-Clerkship Honour Roll, CSM Faculty Appreciation Night
- Internal Medicine Clerkship Teaching Award – Honourable Mention, CSM Faculty Appreciation Night

Dr. Paul Boiteau
- Silver Award for Teaching

Dr. Philippe Couillard
- Associate Dean's Letter of Excellence for Lecturing
- Associate Dean's Letter of Excellence for Small Group Teaching
- Associate Dean's Letter of Excellence for Clinical Core
- Platinum Award for Teaching
- Jersey Award, CSM Faculty Appreciation Night
- Gold Star Award, CSM Faculty Appreciation Night
- Internal Medicine Clerkship Teaching Award – Honourable Mention, CSM Faculty Appreciation Night

(UME Teaching awards continued on next page)

Awards & Recognitions (continued)

Dr. Mike Dunham
- Gold Award for Teaching
- Surgery Clerkship Teaching Award – Honourable Mention, CSM Faculty Appreciation Night

Dr. John Kortbeek
- Internal Medicine Clerkship Teaching Award – Honourable Mention, CSM Faculty Appreciation Night

Dr. Julie Kromm
- Gold Star Award, CSM Faculty Appreciation Night

Dr. Jason Lord
- Internal Medicine Clerkship Teaching Award – Honourable Mention, CSM Faculty Appreciation Night

Dr. Ken Parhar
- Associate Dean's Letter of Excellence for Clinical Core
- Bronze Award for Teaching

Dr. Amanda Roze des Ordons
- Associate Dean's Letter of Excellence for Clinical Core
- Bronze Award for Teaching
- Internal Medicine Clerkship Teaching Award – Honourable Mention, CSM Faculty Appreciation Night

Dr. Ian Schoonbaert
- Internal Medicine Resident Award – Honourable Mention, CSM Faculty Appreciation Night

Dr. Jason Waechter
- Associate Dean's Letter of Excellence for Lecturing
- Associate Dean's Letter of Excellence for Small Group Teaching
- Platinum Award for Teaching
- Gold Star Award, CSM Faculty Appreciation Night
- Internal Medicine Clerkship Teaching Award – Honourable Mention, CSM Faculty Appreciation Night

The collective recognition of our faculty is really amazing. It's also really impressive that department members have been recognized across all aspects of UME teaching!

2019 Calgary Zone Department of Critical Care Medicine Awards

ICU Colleagues nominate peers from each of our ICUs. A selection committee representing all disciplines chooses site/zonal recipients. The following are the winners of the zonal awards.

- Bow Award -Early Career Achievements - **Veronica Courtier**, FMC ICU
- Crowsnest Award-Caring for your Colleagues - **Brynne Aguinaga,** RGH ICU
- Mount Alberta Award -Excellent Lifestyle & Wellbeing - **Jamir Cruz**, SHC ICU
- Mount Assiniboine Award -Outstanding Clinician - **Amber Hughes**, FMC ICU
- Mount Robson Award -Outstanding Patient/Family Centered Care - **Jessica Cheung**, FMC ICU

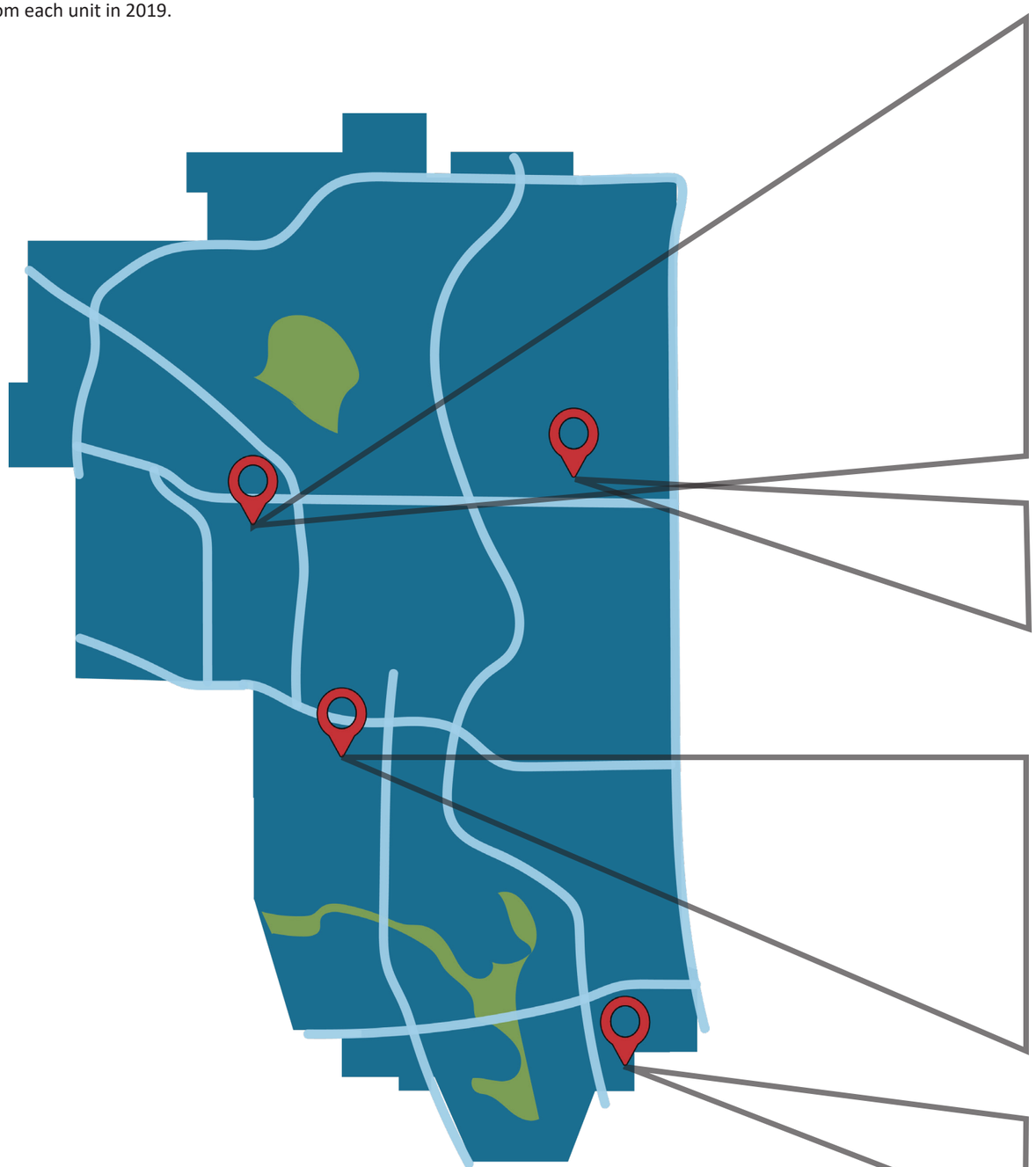
2019 DCCM Celebration of Achievements

Members of the Department of Critical Care Medicine gathered on March 7, 2019 to honour the substantial achievements of some of their fellow colleagues.

- **Dr. Luc Berthiaume** -Promotion to Clinical Associate Professor
- **Dr. Paul Boucher** -Leadership of FMC CVICU and General Systems ICU
- **Dr. Chip Doig** -Department Leadership
- **Dr. Andre Ferland** -Promotion to Clinical Professor
- **Dr. Jason Lord** -Promotion to Clinical Associate Professor
- **Dr. Brent Winston** -Promotion to Professor
- **Dr. Bryan Yipp** -Canada Research Chair
- **Dr. Dan Zuege** -Leadership of the eCritical Alberta Program

Locations

Highlights from each unit in 2019.



Foothills Medical Centre

- FMC Patient and Family Centred Care Committee developed and launched new guidelines for family presence with a goal of reducing barriers to accessing the unit for families and creating consistency amongst team members.
- FMC ICU Team was part of the provincial Delirium Initiative that was recognized for ICU Delirium Best practice and recipients of the Present's Excellence Award.
- The Pulmonary Embolism Response Team was launched (PERT). It is a regional multidisciplinary consultative team to improve care of patients with severe Pulmonary Embolus.

Cardiovascular Intensive Care Unit

- Patient Flow Project – Optimizing patient flow from CVICU to cardiac surgery ward Unit 91.
- Early Recovery After Surgery (ERAS) Phase 1 protocol.
- The CVICU has its own PFCC committee which continues to build the foundation to include the patient and family members as integral partners in healthcare.

Peter Lougheed Centre

- Successful OR to ICU hand over program. DCD (donation after cardiac death) with the Southern Alberta Organ Tissue Donation Program.
- Family participation during rounds and Open Visitation

Rockyview General Hospital

- Leaders in Delirium management: emphasis on frequent and early mobilization despite space limitations.
- Active interprofessional projects: Examples include Enhancing interprofessional patient care rounds, AnaConDa pilot project, Arterial line insertions by RTs.
- OR to ICU Handover: Ongoing multidisciplinary collaboration to optimize OR to ICU Transfers and Admissions with anticipated implementation in 2020.
- Support for Departmental initiatives in Patient and Family Centered Care and Quality Improvement: Donation after Cardiac death and Neurological death, Fall risk identification and mitigation in the ICU/CCU with post Falls review and analysis.

South Health Campus

- Maintenance of TPE program.
- Collaborating with OR and PACU teams in establishing the OR to ICU handover process with anticipated roll out Spring 2020.

More Information

Critical Care Rehabilitation

Work in the Calgary ICU Recovery Clinic (www.ahs.ca/icurecovery) continues. In the past year, 421 patients who were admitted to Calgary ICUs were screened for invitation to the Recovery Clinic. The Recovery Clinic has several exclusion criteria, but the most relevant would be that we do not screen patients to invite to clinic unless they were admitted to an ICU for at least 4 days. Of those screened, 359 were deemed suitable to invite for follow-up and 165 accepted the invitation. This represents approximately 7% of the ICU admissions in the city. Thirty seven percent of patients seen in follow-up were originally treated at the Foothills Medical Centre, 24% originated from the Peter Lougheed Centre, 21% were treated at the Rockyview General Hospital, and 17% had received care in the ICU at the South Health Campus. Twenty one patients were referred directly to the follow-up clinic (primarily patients treated with extra-corporeal life support or patients from the South Health Campus). Once invited, patients were seen either at the South Health Campus outpatients tower on Fridays, or at the Foothills Medical Centre Special Services Building on Wednesdays.

The average ICU lengths of stay for the population we saw were 11 days, and on average we followed up with patients 45 days after they were discharged from hospital. Self-reported quality of life in patients seen was 65/100 on the EuroIQol-5D instrument. On average, patients were not reporting high levels of symptoms of anxiety or stress in the clinic (Generalized Anxiety Disorder 7-item scale = 4/21, Impact of Events Score – Revised = 6/88), but patients did report mild depression symptoms on average (Patient Health Questionnaire – 9 = 7/27). Obviously, individual patients are not well represented by mean scores, and the patients that were followed closely were the outliers with high symptom burden.

All Recovery Clinic patients receive education about their course through the ICU. Many patients are amnestic to the details of their stay in the ICU, with the exception that commonly patients report remembering specific details around care interventions. In particular extubations, awake intubations, and restraint use tend to be strongly recollected. Sometimes hard conversations about prognosis are remembered, and often people have strong memories around delirium. Most participants are prescribed exercise. A small portion of patients are referred to the peer recovery group. Less commonly interventions and investigations are ordered. These might range from ordering electrodiagnostic studies (relatively common) to referrals to surgeons for assessment for contracture release (uncommon). The results of the ICU Recovery Clinic consult are directed to the family physician as a consult letter, with a copy going to the last intensivist that cared for the patient while they were critically ill.

In the coming year, we will continue to collaborate nationally with groups focusing on ICU recovery (e.g. https://www.ccctg.ca/Programs/RECOVER.aspx). Small research projects are ongoing or in development (e.g. bedside ultrasound assessments of sarcopenia, actigraphy use in the ICU to quantify rehab interventions, music therapy acceptability studies). Finally clinical improvement initiatives are ongoing. Funds have been secured from donors at the National Music Centre to expand the Music Therapy in the ICU initiative to the South Health Campus and to continue Music Therapy at the Foothills Medical Centre. In a separate initiative, funds have been secured from an anonymous donor to purchase a functional electrical stimulation supine ergometer for the Foothills Medical Centre ICU. This opens interesting rehabilitation and research options for our patients.

Dr. Chris Grant, MD, Physical Medicine & Rehabilitation
Joanna Everson, NP, Critical Care Medicine

Extracorporeal Life Support Program

Extracorporeal Life Support (ECLS) is a method of life support used in patients with catastrophic cardiac and respiratory failure. It is primarily used to oxygenate and remove carbon dioxide from the blood as well as provide hemodynamic support. ECLS includes veno-venous extracorporeal membrane oxygenation (VV-ECMO), which is used to treat refractory respiratory failure, as well as veno-arterial extracorporeal membrane oxygenation (VA-ECMO), which is used to treat refractory cardiac failure.

ECLS has been provided at the Foothills Medical Center CVICU for several years. During the 2008/2009 H1N1 influenza epidemic there was a renewed interest in expanding the use of ECLS worldwide and also locally. Since then it has been used increasingly for refractory respiratory and cardiac failure. In 2015 a multidisciplinary ECLS committee was created to oversee and improve the delivery of ECLS within Calgary. The objectives of the ECLS committee have been to prioritize the provision of this resource intensive modality to those patients most likely to benefit, whilst improving safety and reducing morbidity during ECLS runs. 2016 was the first full year of the formalized ECLS program.

In 2019, 27 runs of in ECLS were performed in total (23 VA-ECMO and 4 VV-ECMO). In addition several notable accomplishments were made. The Calgary Health Trust generously agreed to support the upgrade of our equipment to a new state of art CardioHelp system. These units arrived in late 2018 and we were able to use them for the first time in 2019. These units have improved our monitoring and ease of transport while minimizing risks to the patients such air emboli and clotting. We conducted our second annual ECLS Education day in conjunction with the ECLS program at Alberta Children's Hospital. Our guest speaker was Dr Laurance Lequier from the Stollery Hospital in Edmonton and he presented on some of the advances in anticoagulation of the ECLS patient. The final notable achievement was the purchase of an ECLS simulator, through a generous donation by the Rotary Club of Calgary. This simulator will be used for future staff training, particularly for high risk situations such as cannulations, ECPR for accidental hypothermia, and for ECMO emergencies.

In 2020, we look to continue our momentum by rolling out our new training and simulation exercises for the cannulation and use of ECLS. We will continue to work together with the ECLS program at the Alberta Children's Hospital to work on areas of mutual interest such as education and simulation. Finally, we will continue to put the pieces in place to move towards being accredited by the international Extracorporeal Life Support Organization as a "Center of Excellence" further demonstrating our commitment to providing the highest quality of care for patients requiring ECLS.

Dr. Ken Parhar, ECLS Committee Chair
Dr. Andre Ferland, CVICU Unit Director

Neurocritical Care

The Neurocritical Care service offers consultations for departmental members of Critical Care Medicine and Cardiac Sciences throughout Calgary and Central/Southern Alberta. Clinical rounds with the neurosurgical team occur three times per week with the aim of integrating patient care, education and research specifically for patients with neurological injuries and diseases in the Foothills Medical Center multi-system ICU. The program supports and benefits from close collaboration with flagship teams such as the Calgary Comprehensive Epilepsy program, the Calgary Stroke program, the University of Calgary Spine program and the Regional Trauma Services.

Our three neurointensivist were certified as a Diplomate in Neurocritical care by the United Council for Neurologic Subspecialties. This is another step towards establishing a NCC training program. We hope to recruit additional fellowship trained neurointensivist to this effect.
Multi-center research studies that are ongoing and include Hemotion Trial (transfusion thresholds in traumatic brain injury), SaHaRA Trial (transfusion thresholds in subarachnoid hemorrhage), INDEX study (CT perfusion in the neurological determination of death), COPILOT (CPP Optimal to Individualize Care of Traumatic Brain Injury Patients) and PROTEST (PROphylaxis for Venous ThromboEmbolism in Severe Traumatic Brain Injury).

We wish to recognize the contribution of Ms Stacy Ruddell to the NCC research program and envy her collaborators in her next professional journey.

Dr. Andreas Kramer
Dr. Julie Kromm
Dr. Philippe Couillard

Organ & Tissue Donation

Whenever possible, providing the option of organ and tissue donation after death is an important aspect of end-of-life care in the intensive care unit (ICU).

The Department of Critical Care Medicine (DCCM) has a strong working relationship with the Southern Alberta Organ and Tissue Donation Program (SAOTDP). Andreas Kramer continues to serve as the Medical Director. Several current donation coordinators are former DCCM nurses. Numerous physicians are developing particular expertise in the area of donation. Paul Boucher, Amanda Roze, and Julie Kromm attended the Canada Critical Care Forum “Donation Masterclass”. Pam Hruska was a co-author of the new Canadian Guidelines for the management of organ donors following neurological determination of death (NDD)[1]. Andreas Kramer was a contributor to the Royal College of Physicians and Surgeons educational curriculum for organ donation. Philippe Couillard teaches neurology residents the nuances of NDD diagnosis using simulation. The neurocritical care team serves as the point of referral for patients in the cardiac ICU (CVICU; Unit 103) that are potential organ donors.

The Alberta Organ and Tissue Donation Registry is the main method whereby Albertans can, in advance, express their intent to be organ and tissue donors. The Registry can be checked simply by contacting the on call coordinator. Having this information in advance is helpful during conversations with families regarding organ and tissue donation. SAOTDP donation coordinators and the Medical Director are available for consultations regarding eligibility for donation.

In 2019, there were 31 deceased organ donors in Calgary. This number is slightly decreased compared with 2016-2018, but is much higher than in previous years. The reason for the recent decline is primarily a reduction in NDD donors, possibly in part related to a relative reduction in deaths from opiate overdoses. The DCD program, introduced in 2016, accounted for 45% of deceased organ donors. Deaths in ICU remain, by far, the most common source of referrals for tissue donation in southern Alberta.

Organ donation is a growing area of critical care research. A review of 2706 deaths occurring in Alberta in 2015 estimated that the provincial organ donation potential is more than 50 donors per million (DPM) per year, compared with a current rate of less than 20 DPM. However, the consent rate in Alberta is only around 50%[2]. Chip Doig was a major contributor to the recent completion of the international Death Prediction and Physiology after Removal of Therapy (DePPaRT) study, the preliminary results of which were presented at the Canadian Critical Care Forum. The CANADA-Donate study was recently published, demonstrating significant variability in practices across the country, which in turn provides direction for potential future research questions. The Foothills Medical Center ICU contributed more patients to this study than any other hospital in western Canada. Notable difference in Alberta compared with some other provinces included: younger donor age (e.g. 40 years in Alberta vs. 56 in Quebec), more use of ancillary testing in NDD (e.g. 89% in Alberta vs. 19% in Ontario), less use of corticosteroids (e.g. 61% in Alberta vs. 97% in B.C.), shorter duration of time from donation consent to organ recovery (e.g. median 27 hours in Alberta vs. 48 hours in B.C. for NDD donors) and a higher “conversion rate” of DCD donors (e.g. 81% in Alberta vs. 43% in Ontario)[3]. A separate study of DCD donation in western Canada demonstrated that despite variability in practices, graft outcomes across provinces were similar[4].

1. Ball IM, Hornby L, Rochwerg B, et al. Management of the neurologically deceased organ donor: a Canadian clinical practice guideline. CMAJ 2020; 192: E361-69.
2. Kramer AH, Hornby K, Doig CJ, et al. Deceased organ donation potential in Canada: a review of consecutive deaths in Alberta. Can J Anaesth 2019; 66: 1347-55.
3. D’Aragon F, Lamontagne F, Cook D, et al. Variability in deceased donor care in Canada: a report of the Canada-DONATE cohort study. Can J Anaesth 2020.
4. Kramer AH, Holliday K, Keenan S, et al. Donation after circulatory determination of death in western Canada: a multicenter study of donor characteristics and critical care practices. Can J Anaesth 2020; 67: 521-31.

Outreach Program

The ICU Outreach Program provides essential tier one coverage at all four adult acute care sites. The response to medical activation calls was recently redesigned into a tiered response, as described below. The redesign was based on analysis of the following:

- Calls and interventions provided by our own program
- Published data on team design and outcomes
- Comparison with other Alberta based programs

The tiered response is led by an experienced ICU Registered Nurse (RN) and Registered Respiratory Therapist (RRT), with direct access to critical care physician support when needed. Level 1 calls require the attendance of the Outreach physician whereas Level 2 and 3 calls are attended by the ICU RN and RRT. This response is designed to:

- Insure an effective response to meet patient and staff needs.
- Recognize ICU Outreach RN and RRT expertise and their ability to provide guidance and support, independent of the ICU physician
- Highlight the importance of ensuring engagement of the most responsible health practitioner during these calls, and
- Insure efficient use of Outreach team resources.

Program Metrics

As shown in Figure 1, the overall number of outreach calls has remained stable since the date of the model change, with a reduction in calls since 2016. The individual metrics highlighted in Table 1 have been stable year over year.

Importantly, as shown in Figure 2, there has been an approximate 28% relative decrease in the number of code blue team activations in the Calgary Zone since the medical outreach team concept was actualized in 2005. This has occurred despite the opening of the South Health Campus in 2013 and the progressive increase in the number of patients hospitalized in the Calgary Zone.

Figure 3 shows that the rate of readmission to the ICU within 72 hours of discharge has not significantly changed, despite the steadily increasing comorbidity profile and acuity of patients admitted to the ICUs in the Calgary Zone.

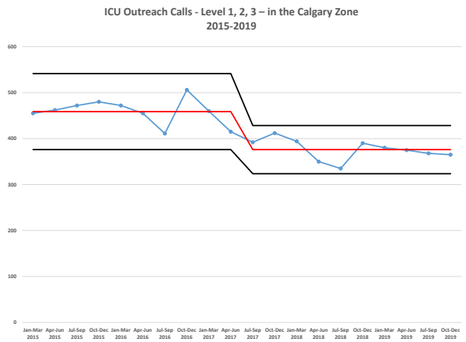


Figure 1

2019	FMC				PLC				RGH				SHC				Total			
# calls	697				234				357				200				1488			
Level of Call	I 56%	II 38%	III 6%		I 38%	II 50%	III 12%		I 31%	II 59%	III 10%		I 27%	II 49%	III 24%		I 43%	II 47%	III 10%	
Time on a call	59 minutes				44 minutes				39 minutes				40 minutes				49 minutes			
% admitted to ICU	28%				23%				13%				11%				21%			
MRP responded	61%				68%				80%				55%				65%			
MRHP directed care	45%				59%				66%				38%				51%			
GOC	R 64%	M 20%	C 0.1%	U 1%	R 75%	M 23%	C 0%	U 1%	R 62%	M 32%	C 0%	U 2%	R 71%	M 24%	C 0%	U 5%	R 66 %	M 24%	C .1%	U 2%
Change in GOC	R-M 3%	R-C 1%	Other 3%		R-M 2%	R-C 0%	Other 2%		R-M 1%	R-C 1%	Other 5%		R-M .5%	R-C 0.5%	Other 3%		R-M 2%	R-C 1%	Other 4%	
Code 66 72h dc from ICU	0.1%				1.7%				0.5%				0%				0.4%			

Table 1

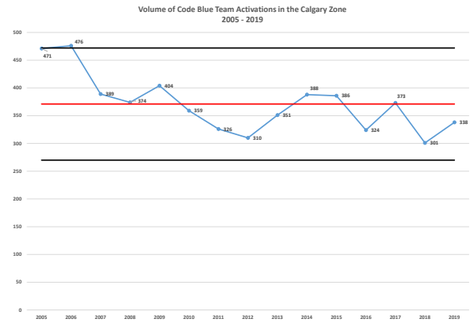


Figure 2

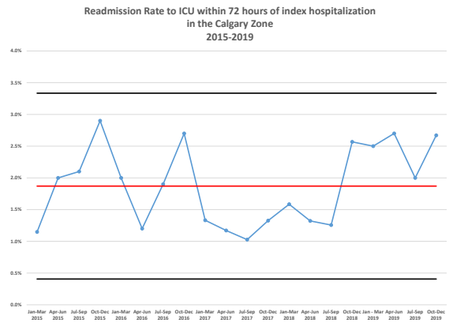


Figure 3

Program Objectives

1. Through early recognition of changes in a patient's physiology and clinical status, reduction of:
   - Code blue team activations
   - Overall hospital mortality
2. Decrease the number of admissions and re-admissions to the ICU by
   - Promoting continuity of care for patients discharged from ICU
   - Provision of specific follow-up visits for patients deemed at high risk of ICU admission
3. Improve care delivery to patients by sharing critical care skills and expertise with non-critical care staff, thus potentially decreasing future ICU team medical activation calls
4. Facilitate positive relationships among health care teams
5. Contribute to the education and mentorship of junior postgraduate trainees rotating in the ICU
6. Insure optimal use of Critical Care resources

System Improvement

When the ICU Executive Council endorsed the plan to transition from a physician led model to a RN/ RRT led physician-supported model, a multidisciplinary working group was convened with the purpose of defining how this model would be implemented. This process, which was led by the Nursing Director for Critical Care and the DCCM QI Lead, was described in detail in last year's report, and was actualized in September 2017.

Addendum

In response to the Covid-19 pandemic, several new and experienced medical Outreach physicians have been recruited during the first few months of 2020, increasing our total FTE complement to over 12 FTE for the first time. We salute the efforts of all members of the outreach team in providing exemplary patient care and also mentorship of junior postgraduate trainees during this stressful time.

Dr. Richard J. Novick, ICU Outreach Program Director
Devika Kashyap, Quality Improvement Lead
Kevin Sedor, ICU Outreach Program Assistant

Quality Improvement

Quality Improvement Priorities

OR-ICU Handover Project Process

DCCM QAC noted a system deficiency with the handover process from the Operating Room (OR) to the ICU (Intensive Care Unit). A recommendation was made to develop a standardized handover process to address this deficiency.

Development of a standardized inter-departmental handover process between OR, PACU, and ICU began at the Foothills Medical Centre (FMC) with successful implementation of the standardized process in April 2016.

Initial spread and development of the standardized OR to ICU handover process occurred at the Peter Lougheed Centre (PLC) in 2017. As they were developing their OR to ICU handover process, the PLC also engaged in the successful development of the inverse handover process - ICU to OR. Implementation of both processes occurred in November 2017 with positive reviews.
The OR to ICU process continues to be relevant and important work across the zone as work continues at the South Health Campus (SHC) and Rockyview General Hospital (RGH). The SHC has been working diligently to tailor the standardized process for their environment with plans to implement the process in the Fall of 2020. RGH is similarly working with their teams and have plans to implement at the end of the year. The inverse process, ICU to OR handover, will be completed at FMC, RGH and SHC in the coming year.

Review & Rebooting Reportable Events List

Patient safety event reporting is an integral component for detecting harms, near misses and clinical adverse events. In order to provide guidance and clarity as to what to report in the critical care setting, a team was assembled to review and reboot the list of reportable safety events for the DCCM. The goal of this work was to provide frontline personnel with a succinct list of reportable events specific to the DCCM. The updated list was implemented in the Fall of 2019.

Developing a Quality Management Framework and a supporting list of Performance Metrics – Focusing our QI portfolio

The DCCM has a long history of using data as a platform to discuss and drive improvement work for the ICU teams. With a robust dashboard of metrics, access to data has been a blessing and a curse. With Metavision and ecritical, the DCCM has access to a detailed and accessible source of data and metrics. This infrastructure is a perfect framework for the DCCM to build a robust and curated list performance metrics to assist the ICU teams further in honing their efforts and focus towards QI priorities that matter to the frontline and our patients. This work is currently underway and set to launch in the summer of 2020.

Calgary Zone Patient and Family Centered Committee

Based on recommendations from the PFCC Steering Committee and approval from ICU Executive, site based PFCC committees were formed in early 2017.
The site based PFCC committees are composed of family advisors and interdisciplinary representation from the unit. The PFCC committees meet regularly and bring forward any opportunities for improvement to the QI Lead and ICU Executive. Site operational and medical leadership guide these meetings.

Devika Kashyap, Quality Improvement Lead

2019 Achievements

1 Creating a Roadmap to guide staff on "What happens when there is potential harm in the process of patient care?"

The roadmap walks through the DCCM steps of detection, review, and action for improvement when safety events occur.

2 Creating a Notifiable Events List

Within a voluntary reporting system, DCCM wanted our staff to be aware of high priority safety events that require a deeper dive. (Similar to "Never Events," we feel certain events have high risk for severe harm and/or link strongly with optimal safe ICU care.) To further increase the reporting of serious adverse events, our QI lead Devika Kashyap has lead a working group to update our Notifiable Events List. Tracey Cressman, our department's Patient Safety lead, works together with our managers and site medical directors makes timely review of these RLS reports possible.

3 M&Ms and Patient Safety Rounds

In 2019, DCCM attendings reviewed 353 mortality charts to screen for elements of suboptimal care. Of these charts, 25 were classified with severe harm or death. These cases may trigger quality improvement. (e.g. DCCM M&M referral to surgery QAC in a post-op bleeding case.) DCCM has also partnered with the Department of Pathology and Dr. Amy Bromley to review 21 cases for learning and safety improvement. Of the 353 cases reviewed in M&Ms, 84 cases were referred to QAC for follow-up.

Site based M&Ms may feed into zonal Patient Safety Rounds (more formally known as "zonal mortality working group"), a bimonthly forum for multi-site multi-disciplinary deeper dive of safety cases. Facilitated by Dr. Selena Au, staff present brief clinical cases, and focus on system issues analysis for output of bottom line learnings as take home message for the staff, as well as feedback for QAC. Themes presented in 2019 include: CVC insertion complications, hypercarbic respiratory arrest, difficult airway management, percutaneous trach complications, use of pacemaker.

4 Quality Assurance Reviews

"The single greatest impediment to error prevention in the medical industry is that we punish people for making mistakes,"
– Lucien Leape (Harvard School of Public Health)

QARs use systems analysis methodology (SAM) to look for contributing factors beyond individual performance. In 2019, the DCCM conducted 1 QARs with 3 recommendations:

Case 1: A patient admitted to the ICU with community-acquired pneumonia and severely reduced ejection fraction required urgent re-intubation after escalating oxygen. Airway capture was difficult and resulted in cardiac arrest. Recommendations included standardization to handover processes and staff guidelines for difficult intubations, and alerts to attendings

Case 2: A patient was transferred from the ICU to the cardiac cath lab for concern for MI. He was on high dose insulin and dextrose and had a hypoglycemic seizure in the recovery room. The patient's chart and accompanying staff were not available during the time of seizure. Recommendations from this joint cardiology and ICU QAR included standardization of handover, staff guidance to role clarity during multi-team cases, and changes in workflow to ensure the chart and patient stays together.

5 Patient Safety Reviews

A patient safety review, similar to QARs, examines a case using systems analysis for contributing factors. Learnings and recommendations are still put forth. The only difference is not requesting Section 9 of the Alberta Evidence Act.

Case: A patient with intraabdominal sepsis, recent stroke and severe delirium was recovering in the ICU after a prolonged stay. She had variable respiratory status and frequently removed her monitors owing to her delirium. In the setting of recently increased pain and delirium medications, the patient had a hypercarbic respiratory arrest in the ICU. Recommendations put forth clarified staff procedures for monitoring patients in transition from critically ill to convalescence.

6 Reporting and Learning Reviews

In 2019, we reviewed 1 reports related to patients in the ICUs were submitted by staff and physicians. The number of reports received by each unit in each quarter is shown in the first figure. The second figure displays the trends in event types reported in all 4 adult ICUs.

7 Immediate RESPONSE with Quality Improvement

Case 1: A patient was intubated in the ICU with a glidescope. During the procedure, the labeling sticker on the stylet fell into the patient's airways during stylet removal from the ETT. After consultant with (MDRD), anesthesia, emergency departments, and human factors, a new standardized location of stylet labeling was selected to remove future risk.

Case 2: An unconscious patient had delay in detection of contact lens, resulting in visual loss. A quality improvement working group is currently underway to standardize contact screening procedure.

Case series: 5 patients had concurrent use of Optiflow tubing and Caripul. Staff reporting allowed the timely notification to QAC for immediate cessation of departmental use and alerts to other departments. Manufacturing investigation is ongoing.

8 Innovation to increase Safety Culture and Productivity

Our department is actively looking to expand our regular chart review to other cases beyond mortality. Led by Dr. Selena Au and Dr. Alyssa Lip, a DCCM working group has systematically created a list of triggers for Strategic Chart Review.

Plans are currently underway to regularly review these events:

- Patient Fall
- Pressure Ulcer
- Readmission to ICU
- Healthcare associated infections
- Any procedural complication
- Over sedation
- Unscheduled withdrawal of surgical catheter,
- probes, drains or other devices
- Missed med rec
- Unplanned extubation
- Major Missed diagnosis by the ICU or other service
- >3 attempts for single intubation
- RLS submitted
- Intraunit cardiopulmonary arrest

9 Patient Safety Week

During October 28-Nov 1, we conducted a daily email blast to educate our staff on our DCCM patient safety processes. Many of our colleagues have placed their voice in an email questionnaire of 'What does Patient Safety means to me?' and key words were summarized in a word cloud.

"To me, patient safety means striving to consistently provide the highest standards of quality care that meets the needs of individual patients, and when this is not achieve, identifying and addressing gaps in order to optimize care in the future."
– DCCM Staff

The email blasts csn be found in the Patient Safety Tab on the DCCM website.

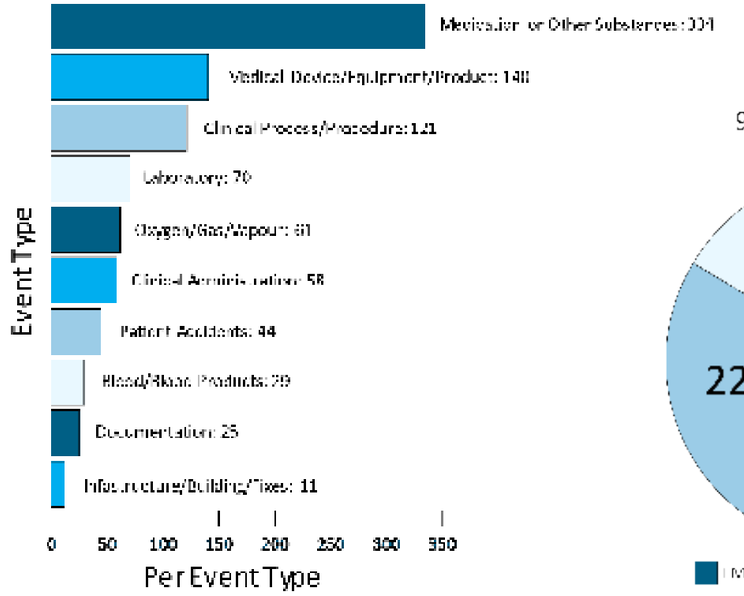
10 Quality Assurance Committee Members

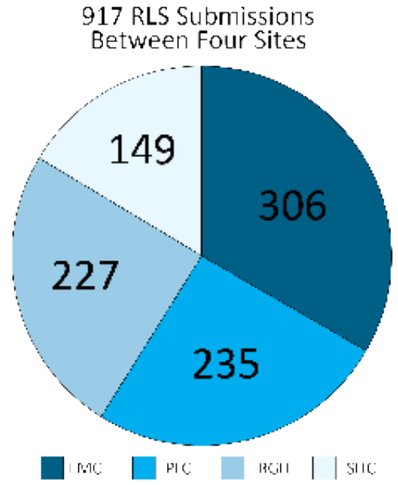
Thank you to our committed members for their ongoing dedication during our monthly meetings!

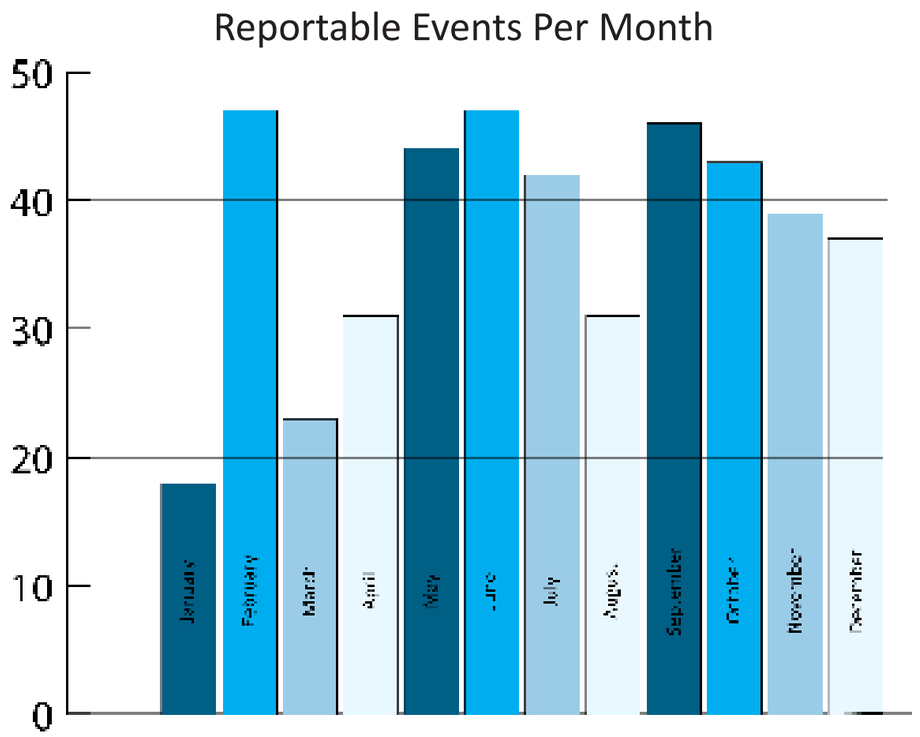
- Selena Au – Medical Director for Quality Improvement and Quality Assurance, Co-Chair
- Caroline Hatcher – Executive Director for DCCM, Co-Chair
- Tom Stelfox
- Kelly Coutts
- Patty Infusino
- Rachel Taylor
- Melissa Redlich
- Luc Berthiaume
- Paul Boiteau
- Frank Warshawski
- Lyle Geldolf
- Pam Hruska
- Dan Cashen
- Emma Foltz
- Miranda Kavalench

Dr. Selena Au
Tracey Cressman

Type of Event Occurrence Over A







Education

Education Office 2019 Highlights

Critical Care Medicine Residency Program

The Department of Critical Care Medicine (DCCM) at the University of Calgary has been fortunate to have trained adult Critical Care Medicine (CCM) physicians since 1988. The Royal College of Physicians and Surgeons survey fully accredited our CCM Training Program for seven years in February 2015. In 2019 we also underwent a successful mid-point internal accreditation process through Postgraduate Medical Education (PGME) at the University of Calgary. Physicians who have graduated from our Training Program have gone on to practice in a variety of both tertiary and secondary centers across Canada and the United States and have helped to shape the modern practice of CCM, not just as clinical leaders but as administrators, researchers and educators in their respective centers.

Presently, there are eight trainees in our CCM Training Program from a variety of base specialty backgrounds (e.g., Internal Medicine, Respirology, Cardiology and General Surgery). We continue to provide entry positions for four trainees each year with a guarantee of two years of funding. Recruitment was fortunately highly successful again this year with four applicants from across Canada choosing to pursue CCM training at the University of Calgary. Over the years the Training Program has built a solid national reputation, if one trusts the fact that we have witnessed increasing numbers of external applicants and that we consistently match into all our offered training positions. The quality of our program is underscored by the results of our graduating trainees on their national licensing exams—all 4 graduating trainees were once again successful in attaining their FRCPC designation in CCM this fall.

Education Curriculum

In addition to outstanding clinical patient care opportunities afforded at the University of Calgary, we continue to strive to improve and grow our formal educational curriculum for CCM trainees. Notable aspects include: a weekly core content curriculum, monthly journal club, monthly morbidity and mortality working group, monthly clinicopathological correlation, multi-professional high-fidelity simulation as well as weekly city-wide grand rounds.

Our core content curriculum covers the foundational expertise required of a CCM specialist across all CanMEDS domains. Educational sessions as part of the core content curriculum are provided by a combination of Departmental attending physicians and local experts and are designed in a small-group, interactive format to maximize participation. Our residents also continue to participate in a variety of PGME-sponsored workshops, including sessions on Teaching techniques, Biomedical Ethics and Medico-Legal aspects of practice. Our trainees also enrolled into a variety of clinical workshops during the year, including Introduction to Bronchoscopy and Difficult Airway Management. This full day workshop integrates didactic and hands-on skills stations to develop strategies and refine techniques for dealing with patients with difficult airways. This interprofessional collaboration is now in its eighth year and targets approximately 30-40 participants per workshop from several disciplines including CCM, Anesthesia, Emergency Medicine, Otolaryngology and Respirology. It also includes involvement from the regional Respiratory Therapists as well as our Critical Care Outreach physicians and DCCM nurse practitioners and physician assistants. We were pleased to continue our expanded enrolment this year to also include residents from Cardiology and General Internal Medicine in our participant pool.

Multi-professional Simulation

The last twelve months have witnessed substantial re-engagement in embedding and improving multi-professional simulation as an educational tool within our Department. Our bi-monthly Level II or advanced simulation sessions see our CCM trainees, ICU nurses and respiratory therapists participate in high-fidelity simulation scenarios preceptored by DCCM faculty and supported by our nurse educators and respiratory therapists as well as our provincial eSIM colleagues. This year we endeavored to develop engaging simulation opportunities for DCCM attending physicians by offering our first Level III high-fidelity, multi-professional simulation sessions with our own ICU attending physicians as participants. We anticipate this will prove fruitful in augmenting team-based competence and multi-professional trust in our Department. Preliminary feedback has been positive, and we hope to expand this continuing medical education opportunity in the months ahead.

MDSC Graduate Program

Program Managed by Dr. Brent Winston

A number of years ago a Critical Care MSc/PhD graduate training program was developed within the University of Calgary Department of Medical Sciences in an attempt to better support departmental academic activities. It offers MSc/PhD graduate students and CCM residents a structured education environment to further their academic pursuits. The program offers a tremendous amount of flexibility to allow training in diverse areas related to Critical care. The program currently offers 3 graduate courses: The Fundamental Basis of Critical Illness (MDSC 623.02) and Basic Pulmonary and ventilator Physiology (MDSC 623.03) and Advanced Pulmonary Physiology (MDSC 623.04). Many graduate students have successfully trained in this MDSC subspecialty training program pursuing advanced graduate MSc and PhD degrees. Students enrolled in the program are expected to present their basic science and clinical research at local, national and international conferences and many students have published their research in well-respected, peer-reviewed scientific journals. The program requires students to have a supervisor who is a member of the Department of Critical Care as well as a supervisory committee that may be made up of diverse members within the University.

For further information about the Critical Care Graduate Program please contact Aggie Chan, MDSC Graduate Program Administrator, Graduate Sciences Education in the Cumming School of Medicine at medgrad@ucalgary.ca or Dr. Brent Winston, Graduate Coordinator, Critical Care Graduate Program at bwinston@ucalgary.ca.

Dr. Jonathan Gaudet, Critical Care Medicine Residency Program Director

Research

In 2019 more than 2,950 patients were admitted to the four general system intensive care units (ICU) across the Calgary Zone with an average stay of 7 days. This is where patients with life threatening, complex medical conditions are treated by highly trained multidisciplinary teams which include Registered Nurses, Respiratory Therapists, Pharmacists, Physiotherapists, Occupational Therapists, Speech Language Pathologists, Dietitians, Intensivists, Physiatrists, and Researchers.

The goal of our Department is to lead and partner in research initiatives to develop and implement new knowledge to provide the best care for critically ill patients. Our Department has much to celebrate and notable research highlights are summarized below.

Health Services Research

In 2019, the Health Services Research program continued focusing on patient and family centered research. Specific programs within the Health Services domain include improving transitions in care from the ICU, de-adopting low value practices in care, promoting gender equity in critical care medicine and promoting patient and family centered practices in the care of “late life” critically ill patients. The Health Services Research program continued using administrative data sources to conduct retrospective cohort studies, and began exploring the use of natural language and machine learning in conjunction with these data sources. This work has been done in collaboration with a multi-disciplinary team including the Critical Care Strategic Clinical Network, patient and family partners and researchers across several departments within and outside of the University of Calgary.

DCCM Clinical Research

In 2019 more than 135 patients were enrolled across 14 different clinical studies in ICUs across the Calgary zone. Dr. Kirsten Fiest replaced Dr. Tom Stelfox as the Director of Research and Innovation in January 2019. The team continues to prioritize maintaining a transparent approach to financial tracking and emphasized addressing backlogs in both finance and research administration. The most recent Department Research Report can be found in Appendix VIII.

Biomedical Research

Kubes Lab

The Kubes laboratory had 18 papers half of which were primary publications and the other half invited reviews in high impact journals like JCI, Immunol. Rev, Blood and Physiol. Rev.
Of the 9 primary papers from the Kubes laboratory 4 were relevant to critical care medicine and in very high impact journals.

1) In a model of systemic Staphylococcus infection, the Kubes lab showed that Staphylococcus was very effectively captured by Kupffer cells of the liver. Dissemination to other visceral organs occurred not via the blood stream but rather via the peritoneum infecting for example kidneys. The macrophages in the peritoneum ate the bacteria but could not kill them and ended up harming the host by shielding the bacteria from the rest of the immune system. Intraperitoneal antibiotic delivery was far more efficacious than intravenous delivery of the same antibiotic. Jorch et al., JCI 129:4643-56.

2) Together with the Senger and Robbins laboratories the Kubes laboratory finally finished a 10 year project trying to identify a novel adhesion molecule in the lung that could recruit neutrophils in response to infectious stimuli. DPEP-1 was identified, a knockout mouse was made and an inhibitor was also created and together the work showed that in simple models of ARDS blocking DPEP-1 spared mice of lung inflammation and death. Cell 178:1205-21.

3) Imaging of biofilms and the immune system was for the first time accomplished in the Kubes laboratory. A pseudomonas biofilm was created in the eye and the imaging revealed a potent immune response comprising mostly of neutrophils that formed a formidable barrier to the bacteria in the form of Neutrophil Extracellular Traps. In the absence of NETs the bacteria were able to disseminate into the brain and kill mice. Cell Host&Microbe 10;25:526-36.

4) In a collaboration with the Fedak laboratory the Kubes laboratory discovered a new immune cell in the pericardial fluid, a healing macrophage. This cell was able to infiltrate an injured heart and helped in preventing fibrosis following a heart attack. Immunity 16;51:131-40.

Jenne Lab

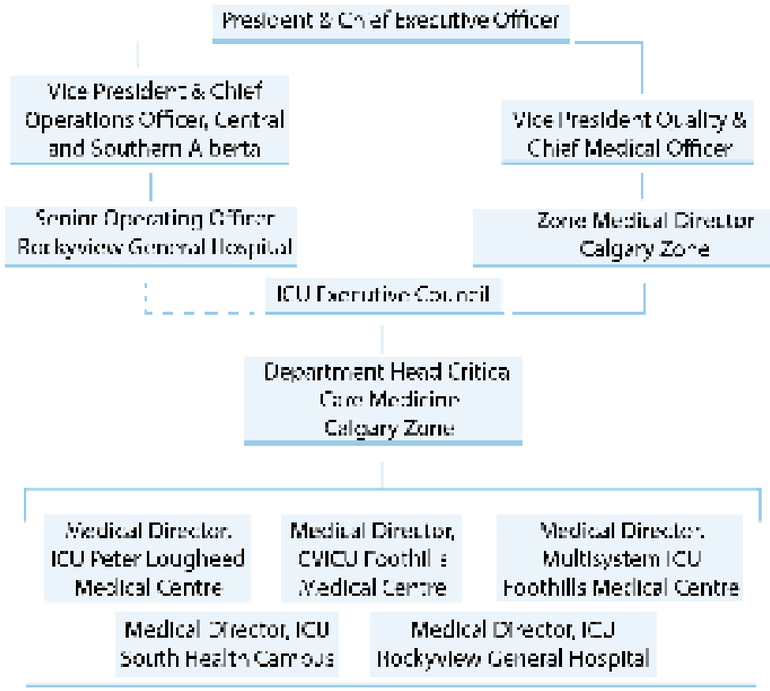
The Jenne Lab had 11 papers in accepted in 2019, many of which were featured in high impact journals (Nature Immunology, Journal of Experimental Medicine, and Blood). These works include 3 reviews, 4 collaborations and 4 primary research papers. Many of these works focus on the role of platelets in the host response to infection and include studies that examine the impact of ASA and thrombin inhibitors on the body’s ability to fight infection. In addition, we were successful in the inaugural New Frontiers in Research Fund grant competition. This new funding competition is supported by all three arms of the Tri-Council funding body and is meant to span medical, engineering and social research. This grant will support the development of a platform to warm, oxygenate and perfuse resected human tissues, keeping the tissue alive for up to three days and allowing for continual imaging of the host immune response and tissue repair using advanced fluorescence microscopy.

Appendices

Organizational Charts

Governance

The Departmental functions are principally located at the four acute care sites, with the Peter Lougheed Medical Centre, Rockyview General Hospital and South Health Campus Hospital providing general intensive care services while the Foothills Medical Centre, in addition, provides tertiary services for Trauma and Neurosciences patients. Cardiovascular Surgery intensive care services are provided at the Foothills Medical Centre in a distinct ICU under the supervision of Intensivists from the Department of Critical Care Medicine.



The Calgary Zone reporting relationships and governance of DCCM are provided in the schema outlined above. The DCCM Head is a member of the Zonal Medical Advisory Committee. All DCCM members share responsibility for the vision, goals and advancement of all facets of the Department: exceptional patient-and-family centered critical care. We lead critical care through our commitment to clinical care, education and research. The Department head meets with the members of the Department, Medical Executive Committee and also with the Zonal ICU Executive Council for operational issues on a regular basis. Participation by medical and non-medical ICU practitioners in our weekly Grand Rounds, our annual Research Day, our site based & Zonal Morbidity and Mortality working group review processes with direct links to our Departmental Quality Assurance Committee and finally social programs foster our strong Zonal and inter-disciplinary cooperation.

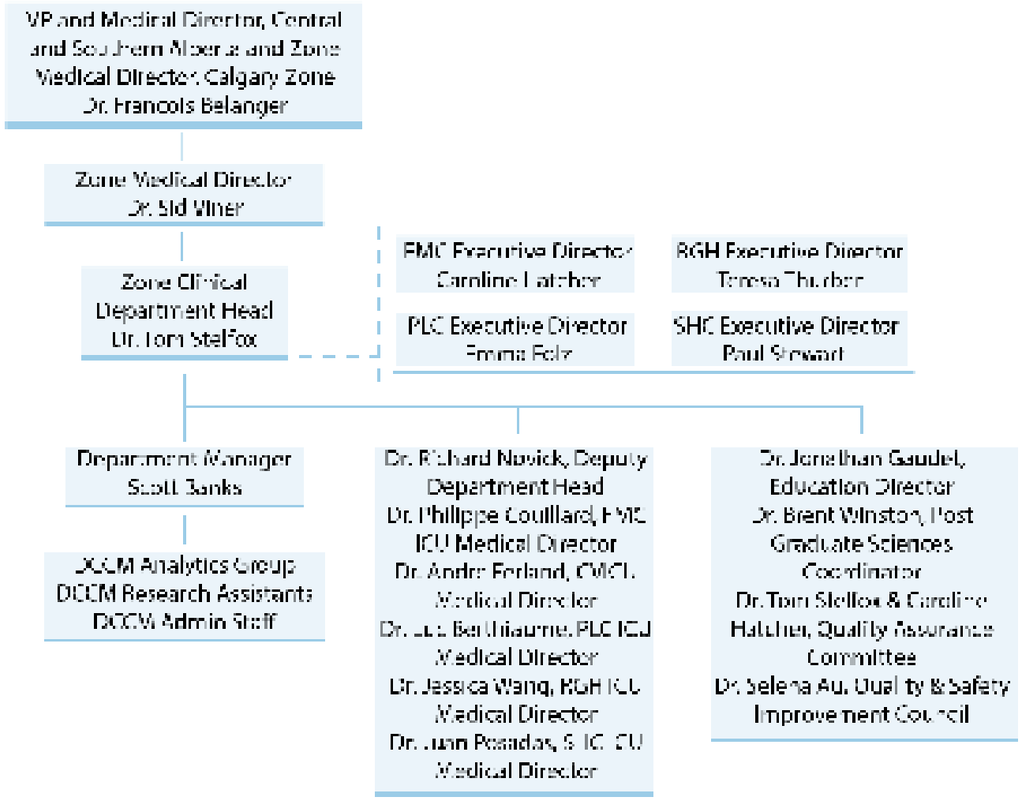
Departmental Committees

The following Departmental Councils and Committees meets on a regular basis based on the Terms of Reference for each group. Councils more often have a zone mandate and a broader inter-professional representation than committees.

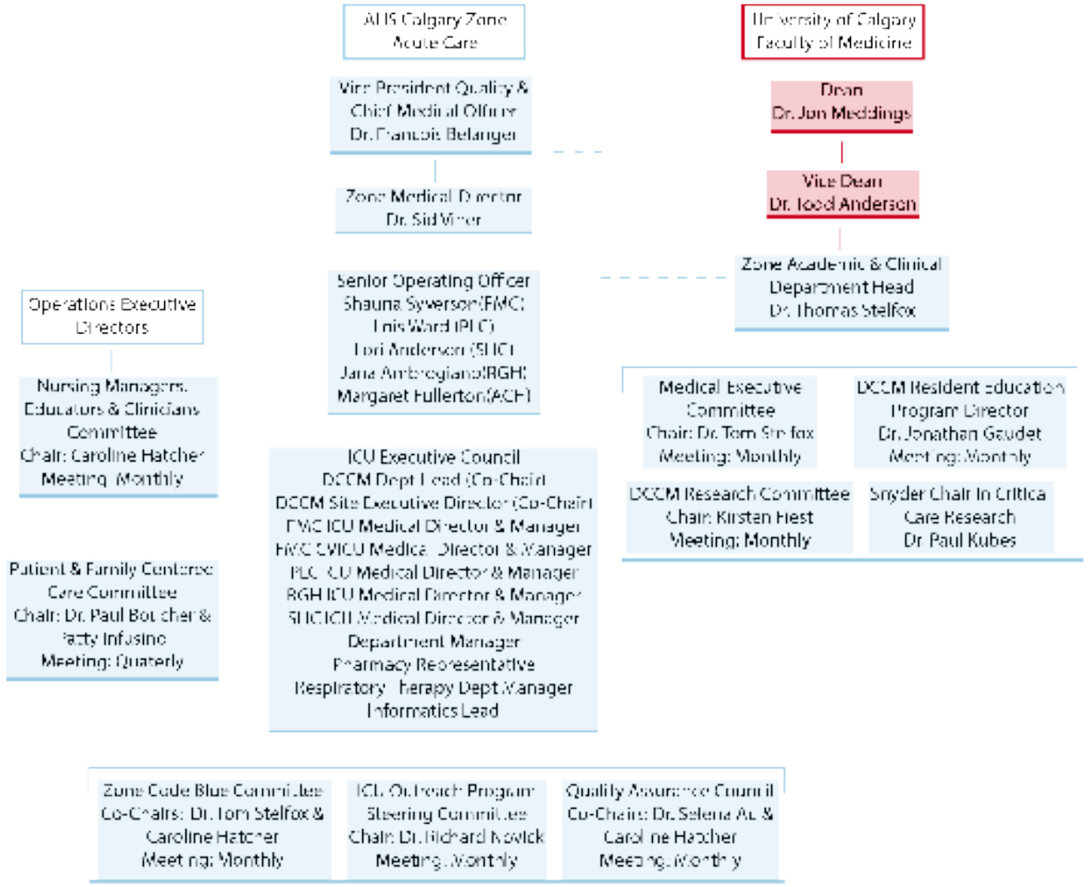
- ICU Executive Council
- Quality Assurance Committee
- Zonal Resuscitation Council
- ICU Medical Executive Committee
- Zonal ICU Outreach Steering Committee
- Zonal Code Blue Committee Meeting
- DCCM Business Meeting
- Mortality Working Group
- DCCM Clinical Research Meeting

Organizational Charts (continued)

Medical Leadership & Administration

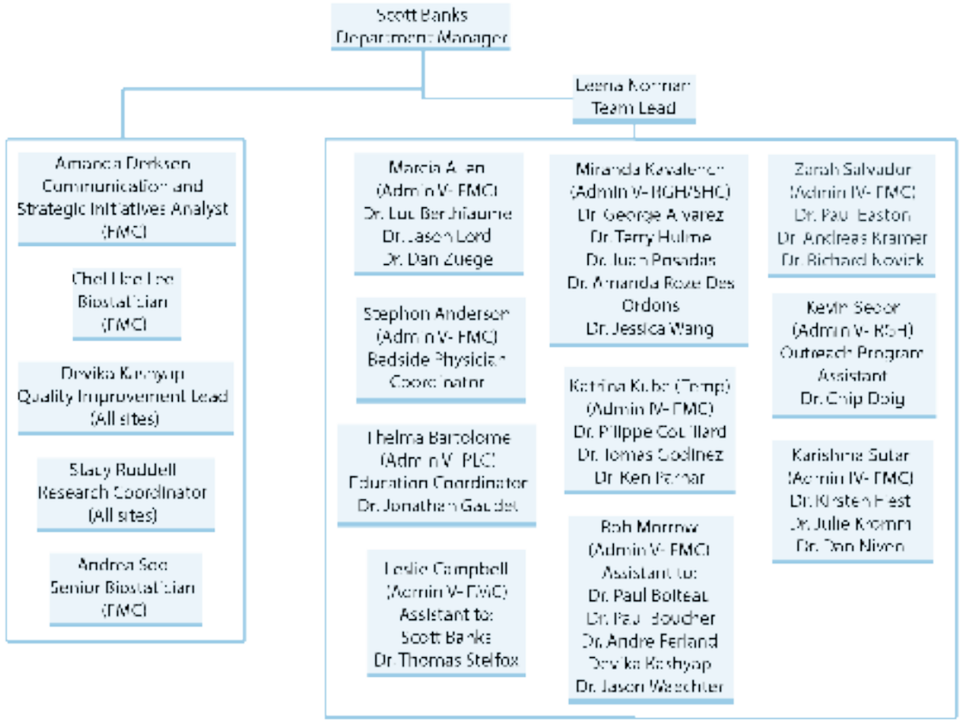


Councils & Committees



Organizational Charts (continued)

Administrative & Support Staff



Members of the Department

Member profiles have been moved to the website.
This allows us to provide the most up-to-date list of department members.

There are six categories that members are categorized into:

- Leadership
- Medical Professionals
- Education
- Research
- Student / Trainee
- Support Staff

View profiles here

Workforce Planning

Summary of Recruitment

Administrative Roles in Critical Care Medicine in 2019:

- **Dr. Philippe Couillard** assumed the role of Medical Director, Foothills Medical Centre
- **Dr. Kirsten Fiest** assumed the role of Director, Research & Innovation
- **Dr. Richard Novick** assumed the role of Deputy Department Head, Clinical Operations

Vacant Positions filled:

- **Amanda Derksen** – Communication and Strategic Initiatives Analyst

Physician Promotions:

- **Dr. Luc Berthiaume** – Clinical Associate Professor
- **Dr. Jason Lord** – Clinical Associate Professor
- **Dr. Brent Winston** – Professor
- **Dr. Andre Ferland** – Clinical Professor

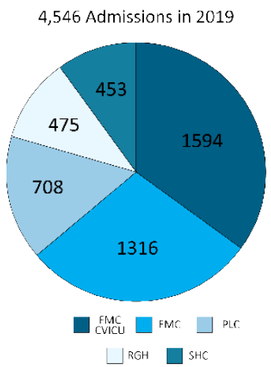
Ongoing recruitment for the following positions:

- Clinician-Scientist (GFT)

Clinical Activity & Organization

The Calgary Zone serves a population in Calgary of approximately 1,286,000 and a regional referral of an additional 300,000 patients from south and central Alberta, southeastern British Columbia and occasionally southwestern Saskatchewan.

There were 4,546 admissions in 2019 in the Departmental ICUs.



Adult critical care is provided in five ICUs; four multi-system ICUs (MSICU) located at each of the Calgary hospitals and one Cardiovascular ICU (CVICU) for the management of post-operative heart patients, located at the Foothills Medical Centre (FMC). The FMC provides regional trauma and tertiary neurologic services within a state of the art 28 bed ICU. It is divided into 3 distinct pods to meet the needs of the critically ill neurologic and trauma patients, the general medical and surgical patient's as well high dependency type patients. The FMC-CVICU has 14 funded beds. The provision of coronary or medical cardiac intensive care is under the purview of the Department of Cardiac Sciences

The Peter Lougheed Centre (PLC) provides regional vascular surgery services and has an 18 bed MSICU while the Rockyview General Hospital (RGH provides regional urology services and has a 10 bed MSICU. The RGH ICU has a slightly older and classic medical-surgical distribution of patients. The South Health Campus (SHC) serving the southern portion of the city has a 10 bed MSCICU.

The adult MSICU's in cooperation with Referral, Access, Advice, Placement, Information & Destination (RAAPID) call center and the Shock Trauma Air Rescue Society (STARS) air ambulance system manage referrals so as to maximize bed utilization while respecting the necessity to offer regional services, such as vascular surgery, at only one site. Currently, any out-of-town physician with a critically ill patient can contact the Department of Critical Care Medicine through RAAPID. The RAAPID dispatcher engages in a conversation with the most appropriate site Intensivist according to patient needs and regional ICU capacity.

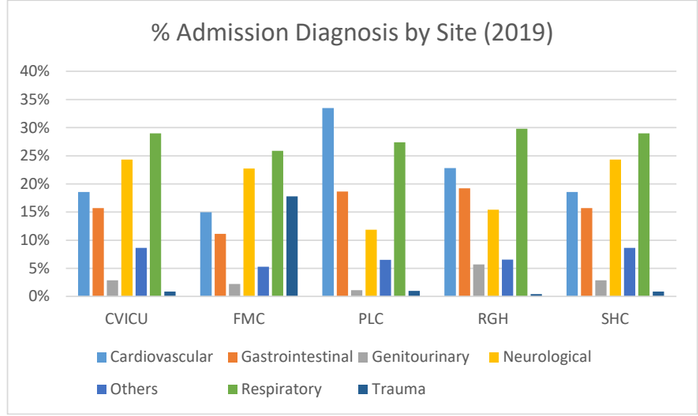
This process is facilitated by a flow map which is a joint initiative of the Department and RAAPID. The key to the success of this process is for all participants and stakeholders to demonstrate the necessary flexibility as our Zonal and Provincial landscape changes.

A conference call with the ICU attending, the referring physician, the STARS 'flight' doctor, and any other specialist can be immediately arranged by this service. Within the city, the adult ICUs have adopted a policy of '1 ICU across 4 hospitals' and frequently the Department coordinates inter-institutional transfers of critically-ill patients. These patients may be transferred directly between ICUs or from an Emergency Department to an ICU. These two mechanisms of referral and transfer have helped ensure that all ICUs provide tertiary care referral service, maximize bed utilization across the zone, and continue the spirit of zonal cohesiveness and cooperation.

Over the years, our Zonal "Out of Region Referrals" policy has been changed to reflect our bed capacity issues and subsequently to reflect the creation of one healthcare system under Alberta Health Services (AHS). We are committed to the repatriation of non-Calgary zone patients to their home jurisdictions (Healthcare Zones) once the need for tertiary care services no longer exists. The cancellation of elective surgeries and the transfer of patients to alternate Health Zone ICUs as Departmental bed capacity management strategies only proceeds once all site over capacity measures have been exhausted within the city of Calgary (see DCCM website). Discussions continue to ensure however, that the needs of our usual referring Alberta Health Zones as well as neighboring Eastern BC Health Systems are met through the endorsement of timely policy revisions by the Departmental ICU Executive Council in collaboration with our Zonal Senior Leadership group.

All ICUs perform standard critical care monitoring and physiologic support. All units are equipped with similar equipment. All adult ICUs have state of the art bedside ultrasound equipment to secure vascular access and perform limited diagnostic thoracic (cardiac, chest) and abdominal scans 24 hours a day. All ICUs can provide continuous renal replacement therapy (CRRT) with accountability for this service falling under the department of critical Care Medicine. A Zonal CPG with clear policies and procedures guides the provision of this service. Intermittent hemodialysis is provided at both the PLC and FMC with the assistance of the Nephrology service.

Patients experiencing catastrophic lung failure, in the absence of multi-system organ failure, may be referred to our Zonal Extra-Corporeal Lung Assist Program, a collaborative effort between Departmental Intensivists working in the FMC CVICU, cardiovascular surgeons and perfusionists from the Department of Cardiac Sciences at the FMC. Intracranial pressure monitoring is performed at the FMC-MSICU; the standard is percutaneous ventricular drains placed by Neurosurgery, and managed by Critical Care. Jugular venous oxygen saturation monitoring, interventional hypothermia and continuous EEG recording are also commonly used.



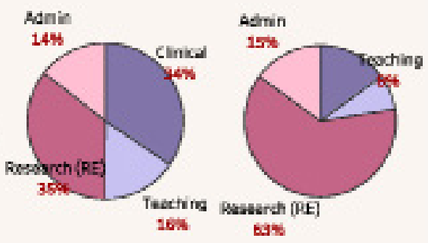
In the past few years, the FMC ICU has been using cerebral microdialysis in association with the placement of intra-parenchymal Codman microsensor ICP transducers and brain tissue Po2 probes as part of a program in neurocritical care led by our 2 neurocritical care intensivists. The decision to concentrate the provision of neurologic critical care services into one pod at the FMC (C Pod) will allow the development of advanced competencies for both nursing and medical staff while enabling the Critical Care Residency Training Program to move forward with establishing a Neurocritical Care Fellowship program for physician trainees following the completion of 2 years of general critical care medicine training.

Annual Report 2018-19 *Critical Care Medicine*

ANNUAL FTEs [3]

	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20 [3.1]
CSM	512	500	508	518	517	526
Basic Sciences	131	126	129	136	141	143
Clinical w. AARP	226	221	222	225	218	218
Clinical w/out AARP	155	153	157	157	161	165
Critical Care Medicine	6	6	6	7	7	7

Clinical without AARP [3.2] *Critical Care Medicine* [3.1]



ANNUAL REs [3]

	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20
CSM	200.7	199.6	201.4	203.0	223.1	230.5
Basic Sciences	69.4	66.8	67.9	72.9	79.6	81.4
Clinical with AARP	80.7	81.5	81.0	83.8	86.4	85.9
Clinical wout AARP	60.6	61.2	62.6	62.9	67.1	69.2
Critical Care Medicine	2.6	2.4	3.6	3.6	4.4	4.1

TOTAL RESEARCH REVENUE [4]

	2014-15	2015-16	2016-17	2017-18	2018-19
CSM	$172.7M	$167.1M	$164.0M	$198.3M	$213.4M
Basic Sciences	$45.7M	$43.7M	$41.6M	$52.3M	$55.7M
Clinical w AARP	$54.4M	$55.6M	$52.5M	$70.1M	$76.8M
Clinical w/out AARP	$25.9M	$24.2M	$27.6M	$30.1M	$34.5M
Critical Care Medicine	$1.1M	$1.5M	$1.9M	$1.6M	$2.0M

RESEARCH REVENUE PER RE [4.1]

	2014-15	2015-16	2016-17	2017-18	2018-19
CSM	$0.69M	$0.67M	$0.66M	$0.73M	$0.77M
Basic Sciences	$0.66M	$0.65M	$0.61M	$0.72M	$0.75M
Clinical with AARP	$0.67M	$0.60M	$0.78M	$0.84M	$0.89M
Clinical without AARP	$0.51M	$0.47M	$0.53M	$0.58M	$0.60M
Critical Care Medicine	$0.41M	$0.64M	$0.54M	$0.46M	$0.46M

TOTAL CIHR REVENUE [5]

	2014-15	2015-16	2016-17	2017-18	2018-19
CSM	$28.4M	$30.4M	$33.0M	$38.7M	$45.3M
Basic Sciences	$15.3M	$14.6M	$14.6M	$16.6M	$18.1M
Clinical w AARP	$10.5M	$12.5M	$13.1M	$14.5M	$15.0M
Clinical w/out AARP	$2.6M	$3.3M	$5.2M	$7.2M	$8.2M
Critical Care Medicine	$0.25M	$0.44M	$0.78M	$0.85M	$1.34M

CIHR REVENUE PER RE [5.1]

	2014-15	2015-16	2016-17	2017-18	2018-19
CSM	$0.14M	$0.15M	$0.16M	$0.19M	$0.21M
Basic Sciences	$0.22M	$0.22M	$0.22M	$0.23M	$0.23M
Clinical with AARP	$0.13M	$0.12M	$0.12M	$0.18M	$0.22M
Clinical without AARP	$0.05M	$0.06M	$0.10M	$0.14M	$0.15M
Critical Care Medicine	$0.11M	$0.18M	$0.22M	$0.23M	$0.31M

TOTAL CLINICAL RESEARCH REVENUE [6]

	2014-15	2015-16	2016-17	2017-18	2018-19
CSM	$14.8M	$23.2M	$38.3M	$38.0M	$37.3M
Basic Sciences	$0.0M	$1.8M	$6.7M	$8.8M	$6.7M
Clinical w AARP	$12.3M	$16.1M	$24.9M	$24.3M	$25.2M
Clinical w/out AARP	$2.4M	$3.5M	$16.9M	$13.7M	$14.2M
Critical Care Medicine	$0.35M	$0.40M	$1.41M	$1.03M	$1.24M

CLINICAL RESEARCH REVENUE PER RE [6.1]

	2014-15	2015-16	2016-17	2017-18	2018-19
CSM	$0.07M	$0.11M	$0.20M	$0.32M	$0.30M
Basic Sciences	$0.00M	$0.03M	$0.10M	$0.12M	$0.09M
Clinical with AARP	$0.15M	$0.30M	$0.45M	$0.59M	$0.52M
Clinical without AARP	$0.05M	$0.08M	$0.32M	$0.26M	$0.25M
Critical Care Medicine	$0.14M	$0.27M	$0.41M	$0.30M	$0.25M

RESEARCH SUPPORT FUND [14]

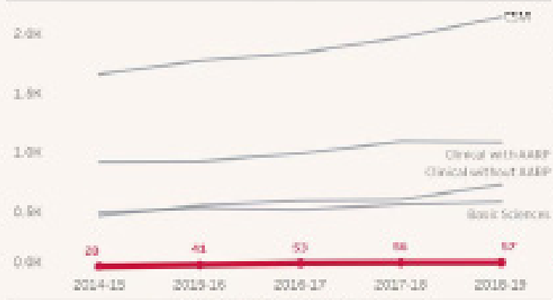
	2014-15	2015-16	2016-17	2017-18	2018-19
CSM	$6.1M	$6.2M	$6.0M	$6.1M	$6.2M
Basic Sciences	$3.0M	$3.0M	$3.0M	$3.0M	$3.1M
Clinical with AARP	$1.4M	$1.4M	$1.7M	$1.9M	$2.0M
Clinical without AARP	$0.7M	$0.7M	$0.8M	$0.9M	$1.1M
Critical Care Medicine	$46.0K	$87.4K	$46.8K	$77.4K	$102.8K

RESEARCH SUPPORT FUND PER RE [14.1]

	2014-15	2015-16	2016-17	2017-18	2018-19
CSM	$21.9K	$22.4K	$25.1K	$25.3K	$27.0K
Basic Sciences	$27.0K	$27.4K	$40.8K	$39.1K	$37.8K
Clinical with AARP	$15.2K	$16.3K	$19.3K	$21.4K	$22.7K
Clinical without AARP	$11.1K	$11.3K	$13.2K	$15.3K	$17.8K
Critical Care Medicine	$11.2K	$9.2K	$11.4K	$19.5K	$25.1K

2014-18 BIBLIOMETRICS *Critical Care Medicine*

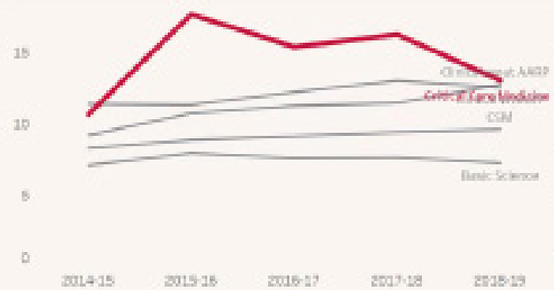
PUBLICATIONS [7]



PUBLICATIONS PER FTE [8]

	2014-15	2015-16	2016-17	2017-18	2018-19
CSM	3.2	3.5	3.6	3.8	4.1
Basic Sciences	3.6	4.1	3.7	3.9	3.8
Clinical with AARP	3.8	3.9	3.8	4.6	4.7
Clinical without AARP	3.0	3.4	3.5	3.7	4.2
Critical Care Medicine	4.7	7.0	6.6	8.0	8.1

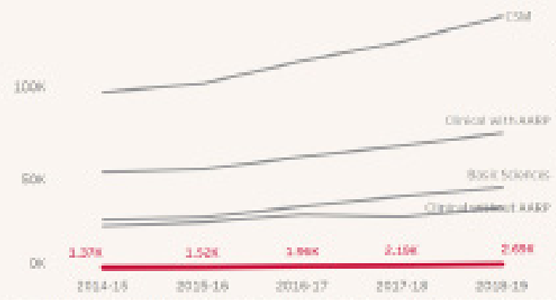
PUBLICATIONS PER RE [9]



PUBLICATIONS PER RE [9]

	2014-15	2015-16	2016-17	2017-18	2018-19
CSM	8.3	8.9	9.1	9.4	9.6
Basic Science	7.1	7.9	7.6	7.7	7.3
Clinical w AARP	11.4	11.3	12.2	13.0	12.5
Clinical wout AARP	9.2	10.7	11.3	11.4	12.7
Critical Care Medicine	10.6	17.6	15.4	16.2	13.0

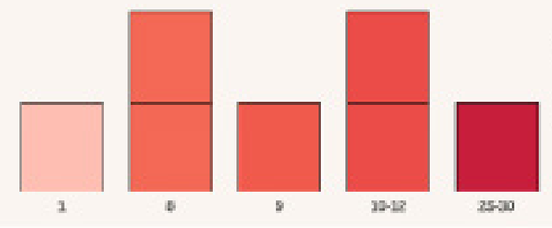
ANNUAL CITATIONS [10]



ANNUAL CITATIONS per FTE [10]

	2014-15	2015-16	2016-17	2017-18	2018-19
CSM	180	204	225	241	267
Basic Sciences	216	236	276	305	325
Clinical with AARP	230	251	289	302	348
Clinical without AARP	161	176	198	190	217
Critical Care Medicine	228	254	245	313	384

PUBLICATIONS BY 2018/19 FTE FACULTY IN 2018 [12]



HOT PAPERS [13]

	2014-15	2015-16	2016-17	2017-18	2018-19
CSM	307	345	389	400	426
Basic Sciences	96	98	112	122	129
Clinical without AARP	74	86	110	92	109
Critical Care Medicine	4	4	12	9	9

Notes & Definitions for the Report

	NOTES and Definitions
1.1	**Year 2019/20** Snapshot of faculty counts, as of June 30 2020. This is the definition used by HR Systems and Reporting and the OIA Fact Books.
2	**FTEs** Full time Academic Staff with Ranks of Professor, Associate Professor or Assistant Professor - Instructor, Senior Instructor - as of June 30 of the previous year (e.g. 2019 FTEs are as of June 30 2018) - Only faculty members in the Cumming School of Medicine (Biochemistry & Molecular Biology, Cell Biology & Anatomy, Community Health Sciences, Microbiology Immunology & Infectious Diseases, Pharmacology & Therapeutics) - Only faculty members in the Faculty of Kinesiology (Kinesiology, Sport Studies, Physical Education & Health) - Only faculty members in the Faculty of Nursing - Only faculty members in the Faculty of Science (Psychology, Neuroscience & Mental Health) - Only faculty members in the Faculty of Veterinary Medicine (Ecosystem & Public Health, Microbiology, Pathology & Physiology & Pharmacology) - Only faculty members in the Faculty of Arts (Geography, Environment & Planning) a) Clinical Faculty in the Cumming School of Medicine (Clinical Neurosciences, Family Medicine, Medicine, Paediatrics) b) Clinical with AHS (Cardiac Sciences, Clinical Neurosciences, Family Medicine, Medicine, Paediatrics) c) Clinical without AHS (Anaesthesia, Critical Care Medicine, Emergency Medicine, Medical Genetics, Obstetrics & Gynecology, Oncology, Pathology & Laboratory Medicine, Psychiatry, Radiology, Surgery) **Source:** Annual Factbook by the U Calgary Office of Institutional Analytics
3	**FEs** Average Research Time Allocation, divided by 200 percent to bring the number of FTE Faculty (see note 2). Note: To account for CSM Academic Staff members with no time allocations reported in the ARO, the previous year's time allocation is used. If the previous year's time allocation is also blank, then the Department's average is assigned. **Source:** Academic Report Online
3.1	**Time Allocation** Average Research Time Allocation (as reported in ARO) for 2018/19 FTE Faculty (see Note 2). Note: To account for CSM Academic Staff members with no time allocations reported in the ARO, the previous year's time allocation is used. If the previous year's time allocation is also blank, then the department's average is assigned. **Source:** Academic Report Online
4	**Total Research Revenue** Annual Research Revenue for Projects assigned to CSM - CSM Incite excludes Project Departments not part of the 20 CSM Departments (e.g. Dean's Department - Operations) * Or the ~$34 million dollar increase in CSM Research Revenue from 2009-10 to 2017-18, ~$25.3 million is grant revenue and ~$10.5 million is contributed revenue (i.e. not grant revenue)
5	**CSM Revenue** Research revenue report (see Note 4), where: IF Account Description = ("CSM-R Grants" OR "CSM-R Authorized Transfers") OR Tri-Council Source = "CSM-R" AND Account Description ("CSM-R Grants" OR "CSM-R Authorized Transfers")
5.1	**CSM Revenue per FE** Annual CSM Research Revenue (See note 5) divided by the number of Research Equivalents in the same year (See note 3) * For the CSM Total, CSM Revenue assigned to Project Departments not part of the 20 CSM Departments is excluded (e.g. Dean's Department - Operations revenue is excluded)
6	**Clinical Research Revenue** Research revenue report (see Note 4), where: Purpose of Funds = "Clinical Trials" OR "Clinical Research" In 2018/19, an accounting change was implemented to better capture clinical research revenue. Prior to 2018/19, only 40% of revenue associated with clinical trials involving "Drug Sponsored Clinical Trials" was classified as "Clinical Research". This led to a large increase in "Clinical Research" revenue in 2018/19 from 2017/18.
6.1	**Clinical Revenue per RE** Annual Clinical Research Revenue (See note 6) divided by the number of Research Equivalents in the same year (See note 3) * For the CSM Total, Revenue assigned to Project Departments not part of the 20 CSM Departments is excluded (e.g. Dean's Department - Operations revenue is excluded)

	NOTES and Definitions Cont'd
7	**Publications** The number of unique papers published by FTE Faculty in the same publication year (e.g. 2018-19 refers to the number of unique papers published by 2018/19 FTE faculty in the 2018 publication year) - Only publications of Document Types "Article", "Review", "Editorial", "Case Report", "Clinical Trial" and "Book" are included. - Papers co-authored by more than 1 FTE faculty member will be counted once within the same Group. **Source:** Web of Science - DV from Authors sent to Office of Faculty Analysis (OFA) in 2019-20
8	**Publications per FTE** Annual number of Unique Publications (see note 7) divided by the number of FTEs in the same year (see note 3)
9	**Annual Publications per RE** - Annual number of unique Publications (see note 7) divided by the number of Research Equivalents in the same year (see note 3)
10	**Citations** The number of times that unique publications by FTE Faculty of a given year have been cited in the same year (e.g. 2018-19 refers to the number of times unique papers published by 2018/19 FTE Faculty were cited in 2019) - Only publications of Document Types "Article", "Review", "Editorial", "Case Report", "Clinical Trial" and "Book" are included. - Papers co-authored by more than 1 FTE faculty member will be counted once within the same Group. **Source:** Web of Science - DVs from Authors sent to Office of Faculty Analysis (OFA) in 2019-20
11	**Citations per FTE** Total citations in a year for all unique career publications by FTE faculty (see note 10), divided by the number of FTE Faculty in the same year (see note 3)
12	**# of Publications by 2018-19 Faculty in 2018** Histogram of the number of papers published by 2018-19 FTE Faculty in 2018
13	**Immediate Impact Papers** Unique publications cited > 40 times in a 5 year publication date window (i.e. for 2018-19, sum of unique publications published between 2014-18 by 2018/19 FTE Faculty that were cited in 2014-18 greater than 40 times)
14	**Research Support Fund** UCalgary was awarded $13,500,000 in 2018/19 of Research Support Fund (plus $125,000 Incremental Projects Grant). This amount was calculated based on the Tri-Council Dollars Data in 2016/17, with the following calculation model: (Table of Allocation Percentages by Agency)
14.1	**Research Support Fund per RE** Annual Research Support Fund (see note 14) divided by the number of Research Equivalents in the same year (See note 3)

Departmental Research Report – Quarter 4

Current DCCM Clinical Studies

Clinical Studies		
Industry Trial	Non-Industry Trial	Local Initiated Trial
3	11	3

Department Member Participation (n=)	
PI	Co-I
11	25

On-going Enrolment – Calgary Zone

Study Name	# Active Enrolment Sites	Patient Enrolment		Start Date
		Most Recent Quarter	Total	
BALANCE	2	1	32	Jan-16
Co-Pilot	1	5	15	Nov-19
STARRT-AKI FMC	1	0	24	Dec-16
STARRT-AKI PLC	1	0	22	Dec-16
RE-ENERGIZE	1	2	11	May-16
INDEX	1	5	44	Feb-18
SAHARA	1	1	14	May-18
HEMOTION	1	0	15	Nov-18
HALO	1	2	2	Nov-18
Protest	1	0	1	Nov-19
Roche INFLUENZA	3	0	1	Jan-19
SGS INFLUENZA	1	0	0	Dec-18
MICRO ICU	1	3	31	Aug-19
ARTI	4	0	41	Dec-18

Patient Enrolment (YTD)

2020	Foothills Medical Centre (n=610)		Rockyview General Hospital (n=235)		Peter Lougheed Centre (n=341)		South Health Campus (n=182)		Calgary Region (n=1,368)	
	Total	N° per 100	Total	N° per 100	Total	N° per 100	Total	N° per 100	Total	N° per 100
Screened	235	74	0	0	20	10	0	0	255	55
Missed*	0	0	0	0	0	0	0	0	0	0
Enrolled	17	5	0	0	1	1	0	0	18	2
Admitted	316		115		195		104		730	

*potentially eligible patients not considered for participation

Research Finances

Period: 2019/20	Total Cost	Total Revenue	Variance
Quarter 1 (April - June)	$ 50,642.10	$ 32,795.95	$ (17,846.15)
Quarter 2 (July - September)	$ 55,297.00	$ 61,645.42	$ 6,348.42
Quarter 3 (October - December)	$ 41,603.00	$ 37,482.50	$ (4,120.50)
Quarter 4 (January - March)	$ 47,030.98	$ 52,080.00	$ 5,049.02
Period: 2019/20 YTD	**$ 194,573.08**	**$ 184,003.87**	**$ (10,569.21)**
Period : 2018/19	**$ 247,031.35**	**$ 309,395.65**	**$ 62,364.30**
Period: 2017/18	**$ 379,979.43**	**$ 278,712.28**	**$ (101,267.15)**
Period: 2016/17	**$ 334,950.00**	**$ 177,249.37**	**$ (157,700.63)**

Research Grants

	Sponsor	Investigator	Title	Amount
2019-2023	CIHR	PI: K. Fiest, T. Stelfox, D. Niven, A. Roze des Ordons, S. AU	Transitions in Care Team Grant: Co-designing a Patient and Family Caregiver-Oriented Transitions in Care Bundle	1,107,027
2019	CIHR	PI: K. Fiest, T. Stelfox	Planning and Dissemination Grant: Establishing stakeholder priorities for the development and implementation of strategies to support gender equity in critical care medicine	9,970
2019-2020	CIHR	PI: K. Fiest, D. Niven Co-I D. Zuege, T. Stelfox	SPOR ICT Catalyst Grant: Developing a provincial learning healthcare system- an innovative clinical trial to optimize safe and effective use of human albumin solutions	98,312
2019-2020	CIHR	PI: K. Fiest	Canadian Sepsis Research Network: Improving Care Before, During and After Sepsis	24,970
2019-2021	CIHR	PI: K. Fiest, J. Parsons, T. Stelfox CO-I: D. Niven, A. Roze des Ordons, S. AU	Improving Transitions in Care from ICU: Evaluation of an Electronic Communication Tool.	198,536
209-2020	CIHR	PI: K. Fiest	Moving Engagement Beyond the Beside: Family-Partnered Delirium Prevention, Detection and Management in the Critically Ill" submitted to the Catalyst Grant: Patient-Oriented Research	99,889
2019-2021	Choosing Wisely Canada	PI: D. Niven, CO-I: K. Fiest, D. Zuege	REDUCE (RED blood cell Utilization in Critical carE)	99,631
2019	CIHR	Co-PI: B. McDonald	CIHR Sepsis Network	6,700,000
2019	Alberta Innovates- Health Solutions	PI: B. McDonald	Alberta Innovates Clinician Fellowship	70,000
2019-2020	The Lung Association of Alberta	PI: B. Winston	PI: B. Winston Relative folate deficiency contributes to ARDS: a validation study	30,000
2019	University of Calgary	PI: B. Yipp	Eyes High International Collaborative Grants for New Researchers. "Human 'Lung-on-a-Chip' for Engineering Solutions for Health.	11,850
2019-2022	CIHR	PI: D. Niven, T. Stelfox	Creating a Living Knowledge Translation Agenda to Improve the Delivery of Evidence-based Care in Adult Critical Care Medicine	393,974

	Sponsor	Investigator	Title	Amount
2019	CIHR	PI: B. McDonald	The role of the gut microbiota in host defense against infection during critical illness	50,00
2019	Cumming School of Medicine	PI: B. McDonald	The role of the gut microbiota in host defense during critical illness	40,000
2019	Alberta Health Services	PI: B. McDonald	Microbiota-immune interactions and critical illness outcomes in the intensive care unit (MicroICU)	20,000
2019	University of Calgary	PI: J. Kromm	Office of Health and Medical Education Scholarship Innovation Project Grant	10,000
2019	University of Calgary	PI: J. Lord	OHMES Health Science and Medical Education Research and Innovation Award	9,500
2019	Baxter Healthcare Corporation	PI: G. Alvarez, J. Posadas, J. Posadas	Therapeutic Plasma Exchange in Septic Shock	21,000
2019 - 2020	OHMES	PI: A. Roze des Ordons	Exploring debriefer approaches to difficult debriefing through conversation analysis	9,980
2019-2020	OHMES	PI: A. Roze des Ordons	Adapting the R2C2 feedback model to "in the moment" feedback conversations in the clinical setting	10,000
2019-2020	OHMES	PI: A. Roze des Ordons	Hospitalist-led Code 66 activations: An interprofessional simulation program to improve competency in Crisis Resource Management (CRM)	5,570
2019-2021	Taylor Institute Teaching and Learning Grant	PI: A. Roze des Ordons	Peer observation of clinical teaching: exploring experiences and impact	19,100
2019	HRJ Foundation	PI: P. Mcbeth	Intelligent Systems Monitoring for Pre-hospital Transport of Critically Ill Patients	350,000
2019-on-going	OHMES	CO-I: J. Gaudet	Risky Business? The Promise and Challenge of Developing, Implementing and Enculturing Group Decision Making Processes Through Competence Committees: An Ethnographic Case Study	9,500

	Sponsor	Investigator	Title	Amount
2019-2022	CIHR	CO-I: K. Fiest	Exploring the existence of gender inequity with an intersectionality lens in academic health care, health sciences and health policy and interventions to optimise gender equity	363,375
2019	CIHR	CO-I: K. Fiest, B. Winston, B. McDonald	Planning and Dissemination Grant: National Preclinical Sepsis Platform- Developing a framework for accelerating innovation in Canadian sepsis research	9,995
2019	CCSCN	CO-I: D. Zuege	Evaluation of Oxygen Administration in Mechanically Ventilated Patients	20,000
2019-2021	University of Calgary	CO-I: T. Stelfox	Between Two Paradigms: Comparing experiences and outcomes for adolescents treated at pediatric and adult trauma centers	25,000
2019-2024	CIHR	CO-I: T. Stelfox	Canadian Sepsis Research Network	5,700,000
2019-2023	CIHR	CO-I: T. Stelfox	RECOVER Program: A Care Continuum after Critical Illness	932,280
2019-2021	MSI Foundation	CO-I: T. Stelfox	Implementation of a medical respite program for the homeless	99,310
2019	CIHR	CO-I: B. McDonald, P. McBeth	Quantification of the Duration of Increased Risk for Venous Thromboembolism in Patients with Femur Fractures Using Thrombelastography	834,616
2019-2021	Orthopaedic Research and Education Foundation	CO-I: B. McDonald	Hypercoagulability After Hip Fracture as Determined by Thrombelastography	266,650
2019-2023	CIHR	(Co-applicant) B. McDonald	Integrated Microbiome Platforms for Advancing Causation Testing and Translation (IMPACTT)	3,000,000

Peer Reviewed Manuscripts

January 2019

1. Proceedings from the 8th Annual University of Calgary Leaders in Medicine Research Symposium. Logan LM, Jensen SK, Singh N, Peplowski MA, Rabi D, Yipp BG, Hollenberg MD, Beck PL. Clin Invest Med. 2019 Jan 30;41(4):E165-E185.
2. Megjhani M, Alkhachroum A, Terilli K, Ford J, Rubinos C, Kromm J, Wallace B, Connolly ES, Roh D, Agarwal S, Claassen J, Padmanabhan R, Hu X, Park S. An active learning framework for enhancing identification of non-artifactual intracranial pressure waveforms. Physiologic Measurement. 2019; 40(1): 015002.
3. Sims CR, Warner MA, Stelfox HT, Hyder JA. Above the GRADE: Evaluation of Guidelines in Critical Care Medicine. Crit Care Med. 2019 Jan;47(1):109-113. Doi: 10.1097/CCM.0000000000003467.
4. Papathanassoglou EDE, Skrobik Y, Hegadoren K, Thompson P, Stelfox HT, Norris C, Rose L, Bagshaw S, Meier M, LoCicero C, Ashmore R, Brulotte TS, Hassan I, Kutsogiannis J. Relaxation for Critically ill Patient Outcomes and Stress-coPI:ng Enhancement (REPOSE): A protocol for a PI:lot randomized trial of an integrative intervention to improve critically ill patients' delirium and related outcomes. BMJ Open. 2019 Jan 15;9(1):e023961. doi: 10.1136/bmjopen-2018-023961.
5. White DE, Navjot V, Jackson M, Stelfox HT, Wasylak T, Ghali W. Experimenting with Governance: Alberta's Strategic Clinical Networks. Healthcare Quarterly. January 2019: 21(4):37-42. doi:10.12927/hcq.2019.25742.
6. Roze des Ordons AL, Au S, Blades K, Stelfox HT. Family participation in ICU rounds – working towards improvement. J Eval Clin Pract. 2020 Jan 9. doi.org/10.1111/jep.13345.
7. The iTClamp in the treatment of prehosPI:tal craniomaxillofacial injury: a case series study. Mckee JL, Mckee IA, Ball CG, Tan E, Moloff A, McBeth PB, LaPorta A, Bennett B, Filips D, Teicher C, Kirkpatrick AW. J Inj Violence Res. 2019 Jan;11(1):29-34.
8. Au S. Measuring outcomes of ethics consultations. EmPI:rical and ethical challenges Author response. Crit Care Med. 2019 Jan;47(1):e68.

February 2019

9. Stelfox HT, Brundin-Mather R, Soo A, Parsons Leigh J, Niven DJ, Fiest KM, Doig CJ, Zuege DJ, Kushner B, Clement F, Straus SE, Cook DJ, Bagshaw SM, Sauro KM. A Multicentre Controlled Pre-Post Trial of an Implementation Science Intervention to Improve Venous Thromboembolism Prophylaxis in Critically Ill Patients. Intensive Care Med. 2019 Feb;45(2):211-222. doi: 10.1007/s00134-019-05532-1.
10. Varela LO, Wiebe N, Niven DJ, Ronksley PE, Iragorri N, Robertson HL, Quan H. Evaluation of interventions to improve Electronic Health Record documentation within the inpatient setting: Protocol for a Systematic Review. Systematic Reviews. 2019;8(1):54.
11. De Grood CM*, Job McIntosh CN, Boyd JM*, Zjadewicz K, Parsons Leigh J, Stelfox HT, On behalf of the ICU Transfer Summary Consensus Panel. Identifying essential elements to include in Intensive Care Unit to hosPI:tal ward transfer summaries: a consensus methodology. J Crit Care. 2019 Feb;49:27-32. Doi: 10.1016/j.jcrc.2018.10.001.
12. Roze des Ordons AL, MacIsaac L, Everson J, Hui J, Ellaway R. A pattern language of compassion in intensive care and palliative care contexts. BMC Palliative Care. 2019;18:15.
13. Spooner AJ, Faulkner CM, Novick RJ, Kent WDT. Optimizing Surgical Skills in Cardiac Surgery Residents with Cardiac Transplant in the High-Fidelity Porcine Model. Innovations (Phila). 2019 Feb;14(1):37-42. doi: 10.1177/1556984519828016.
14. Au S. Improving the Quality of Family Participation in Intensive Care Unit (ICU) Rounds through Effective Communication and Telemedicine. Author response. Crit Care Med. 2019 Feb;47(2): e159–e160.
15. Casault C, Posadas-Calleja JG. Secondary Hemophagocytic Lymphohistiocytosis: A Challenging Diagnosis in a Patient with Autoimmune Hepatitis. Case Reports in Critical Care 2019; Volume 2019 (February):1-4

March 2019

16. Altura KC, Patten SB, Williams JVA, Fiest KM & Jette N. Living with migraine in Canada – a national community-based study. Canadian Journal of Neurological Sciences. Can J Neurol Sci. 2019 Mar;46(2):216-223. doi: 10.1017/cjn.2019.3.
17. Sauro KM, Brundin-Mather R, Parsons Leigh J, Niven DJ, Kushner B, Soo A, Cook DJ, Straus S, Doig CJ, Bagshaw SM, Stelfox HT. Improving the Adoption of Low Molecular Weight Heparin to Prevent Venous Thromboembolism in Critically Ill Patients: A Process Evaluation of a Multi-faceted Knowledge Translation Intervention. J Crit Care. 2018 Nov 29;50:111-117. doi: 10.1016/j.jcrc.2018.11.023.
18. Ellaway RH1, Malhi RL, Woloschuk W, de Groot JM, Doig CJ, Myhre D. An Axiological Analysis of One Medical School's Admissions Process: Exploring Individual Values and Value Systems. Acad Med. 2019 Mar 12. doi: 10.1097/ACM.0000000000002698.
19. Sauro KM*, Bagshaw S, Niven DJ, Soo A, Brundin-Mather R, Parsons Leigh J, Cook DJ, Stelfox HT. Barriers and facilitators to adoption of high value practices and de-adoption of low value practices in the intensive care unit. BMJ Open. 2019 Mar 15;9(3):e024159. doi: 10.1136/bmjopen-2018-024159.

April 2019

20. Krewulak KD, Stelfox HT, Ely EW, Davidson JE, Ismail Z, & Fiest KM. Family ICU Delirium Detection Study (FIDDS): results from a PI:lot study. CMAJ Open. 2019 Apr 26;7(2):E294-E299. doi: 10.9778/cmajo.20180123
21. Parsons Leigh J, de Grood C, Ahmed SB, Ulrich AC, Fiest KM, Straus SE, Stelfox HT. Towards Gender Equity in Critical Care Medicine: A Qualitative Study of Perceived Drivers, Implications and Strategies. Crit Care Med. 2019 Apr;47(4):e286-e291. doi: 10.1097/CCM.0000000000003625
22. Young P, Bellomo R, Bernard G, Niven DJ, Schortgen F, Saxena M, Beasley R, Weatherall M. Fever Control in Critically Ill Adults: An Individual Patient Data Meta-analysis of Randomised Controlled Trials. Intensive Care Medicine. 2019;45(4):468-476. doi: 10.1007/s00134-019-05553
23. Sauro KM, Soo A, Kramer A, Couillard P, Kromm J, Zygun D, Niven DJ, Bagshaw SM, Stelfox HT. Venous Thromboembolism Prophylaxis in Neurocritical Care Patients: Are Current Practices, Best Practices? Neurocritical Care. 2019; 30(2): 355-363.

24. Sauro KM*, Brundin-Mather R, Parsons Leigh J, Niven DJ, Kushner B, Soo A, Cook DJ, Straus S, Doig CJ, Bagshaw S, Stelfox HT. Improving the adoption of optimal venous thromboembolism prophylaxis in critically ill patients: A process evaluation of a complex quality improvement initiative. Journal of Critical Care. J Crit Care. 2019 Apr;50:111-117. doi: 10.1016/j.jcrc.2018.11.023.
25. Bagshaw SM, Adhikari NKJ, Burns KEA, Friedrich JO, Bouchard J, Lamontagne F, McIntrye LA, Cailhier JF, Dodek P, Stelfox HT, Herridge M, LaPI:nsky S, Muscedere J, Barton J, Griesdale D, Soth M, Ambosta A, Lobovic G, Wald R for the Canadian Critical Care Trials Group. Selection and Receipt of Kidney Replacement in Critically Ill Older Patients with AKI. Clin J Am Soc Nephrol. 2019 Apr 5;14(4):496-505. doi: 10.2215/CJN.05530518.
26. Soril LJ*, Noseworthy TW, Stelfox HT, Zygun DA, Clement FM. Facilitators and Barriers to Adopting a Restrictive Red Blood Cell Transfusion Practice: A Population-based Cross-Sectional Survey of Intensive Care Physicians. CMAJ Open. 2019 Apr 23;7(2):E252-E257. doi: 10.9778/cmajo.20180209.
27. Soril LJ*, Noseworthy TW, Stelfox HT, Zygun DA, Clement FM. A Retrospective Observational Analysis of Red Blood Cell Transfusion Practices in Stable, Non-Bleeding Adult Patients Admitted Nine Medical-Surgical Intensive Care Units. J Intensive Care. 2019 Apr 4;7:19. doi: 10.1186/s40560-019-0375-3.
28. Bertoletti L, Murgier M, Stelfox HT. Direct oral anticoagulants for venous thromboembolism prophylaxis in critically ill patients: Where do we go from here? Intensive Care Med. 2019 Apr;45(4):549-551. doi: 10.1007/s00134-019-05605-1.
29. A Randomized Controlled Trial using iTClamp, Direct Pressure, and Balloon Catheter Tamponade to Control Neck Hemorrhage in a Perfused Human Cadaver Model. Mckee JL, Mckee IA, Bouclin MD, Filips DF, Atkinson IJ, Ball CG, McBeth PB, Kirkpatrick MAW. J Emerg Med. 2019 Apr;56(4):363-370.

May 2019

30. Stone CR, Haig T, Fiest KM, McNeil J, Brenner DR, Friedenreich CM. The association between sleep duration and all-cause and cancer-specific mortality among cancer survivors: A systematic review and meta-analysis. Cancer Causes Control. 2019 May;30(5):501-525. doi: 10.1007/s10552-019-01156-4.
31. Fernando SM, McIsaac DI, Perry JJ, Rochwerg B, Bagshaw SM, Thavorn K, Seely AJ, Forster AJ, MD, Fiest KM, Dave C, Tran A, Reardon PM, Tanuseputro P, Kyeremanteng K. Frailty and Associated Outcomes and Resource Utilization Among Older Intensive Care Unit Patients with Suspected Infection. Crit Care Med. 2019 May 24. doi: 10.1097/CCM.0000000000003831.
32. Soo A, Zuege DJ, Fick G, Niven D, Berthiaume L, Stelfox HT, Doig C. Describing organ dysfunction in the intensive care unit: a cohort study of 20,000 patients. Critical Care 23(1):186, 2019.
33. Blanchard IE, Kozicky R, Dalgarno D, Simms J, Goulder S, Williamson TS, Biesbroek S, Page L, Leaman K, Snozyk S, Redman L, Spackman K, Doig CJ, Lang ES and Lazrenko G. Community paramedic point of care testing: validity and usability of two commercially available devices. BMC Emerg Med. 2019 May 2;19(1):30. doi: 10.1186/s12873-019-0243-4.
34. Ying L, Lovedeep K, George A, Paul MB. Persistent Hypoglycemia in Venlafaxine Overdose. Archives of Clinical and Medical Case Reports 2019, Vol 3, No. 3; pp94-99
35. Alvarez G, Chrusch C, Hulme T, Posadas-Calleja JG. Renal replacement therapy: a practical update. Can J Anaesth. 2019 May;66(5):593-604. doi: 10.1007/s12630-019-01306-x.
36. Montgomery C, Zuege DJ, Roldson DB, Opgenorth D, Hudson D, Stelfox HT, Bagshaw SM. Implementation of Population-Level Screening for Frailty Among Patients Admitted to Adult Intensive Care in Alberta, Canada. Can J Anaesth. 2019 May 29. doi: 10.1007/s12630-019-01414-8.
37. Deb S, Singh SK, de Souza D, Chu MWA, Whitlock R, Meyer SR, Verma S, Jeppsson A, Al-Saleh A, Brady K, Rao-Melacini P, Belley-Cote EP, Tam DY, Devereaux PJ, Novick RJ, Fremes SE; SUPERIOR SVG Study Investigators. SUPERIOR SVG: no touch saphenous harvesting to improve patency following coronary bypass grafting (a multi-Centre randomized control trial, NCT01047449). J Cardiothorac Surg. 2019 May 2;14(1):85. doi: 10.1186/s13019-019-0887-x.
38. Heyland DK, van Zanten ARH, Grau-Carmona T, Evans D, Beishuizen A, Schouten J, Hoiting O, Bordejé ML, Krell K, Klein DJ, Gonzalez J, Perez A, Brown R, James J, Harris MS; Investigators of the PROMOTE LP101-CL-201 Trial. A multicenter, randomized, double-blind study of ulimorelin and metoclopramide in the treatment of critically ill patients with enteral feeding intolerance: PROMOTE trial. Intensive Care Med. 2019 May;45(5):647-656 (JG Posadas-Calleja part of the PROMOTE Study Group)

June 2019

39. Parhar KK, Zjadewicz K, Soo A, Sutton A, Zjadewicz M, Doig L, Lam C, Ferland A, Niven DJ, Fiest KM, Stelfox HT, & Doig CJ. EPI:demiology, mechanical power, and long term outcomes of patients with Berlin definition acute resPI:ratory distress syndrome identified using a prospective standardized screening protocol: an observational cohort study. Annals Am Thorac Soc. 2019 Jun 27. doi: 10.1513/AnnalsATS.201812-910OC.
40. Expression of a constitutively-active human STING mutant in hematopoietic cells produces an Ifnar1-dependent vasculopathy in mice. Gary R. Martin, Kimiora Henare, Carolina Salazar, Teresa Scheidl-Yee, Laura J. Eggen, Pankaj P. Tailor, Jung Hwan Kim*, John Podstawka*, Marvin J. Fritzler, Margaret M. Kelly, Bryan G. Yipp, Frank R. Jirik. Life Sci Alliance. 2019 Jun 20;2(3). (JEM open access). * Yipp Trainee.
41. Tran D, Thanh N, Opgenorth D, Wang X, Zuege DJ, Zygun D, Stelfox HT, Bagshaw S. Association between strained ICU capacity and healthcare costs in Canada: A population-based cohort study. J Crit Care. 2019 Jun;51:175-183. doi: 10.1016/j.jcrc.2019.02.025.
42. Kramer AH and Kromm J. Quantitative Continuous EEG: Bridging the Gap Between the ICU Bedside and the EEG Interpreter. Neurocrit Care. 2019; 30(3): 499-504.
43. Kramer AH, Hornby K, Doig CJ, Armstrong D, Grantham L, Kashuba S, Couillard PL, Kutsogiannis DJ. Decreased organ donation potential in Canada: a review of consecutive deaths in Alberta. Can J Anesth. June 25, 2019. 66:1347–1355.

44. Moore L, Lauzier F, Tardif PA, Boukar KM, Farhat I, Archambault P, Mercier E, Lamontagne F, Chasse M, Stelfox HT, Berthelot S, Gabbe B, Lecku F, Yanchar N, ChamPI:on H, Kortbeek J, Cameron P, Bonaventure PL, Paquet J, Truchon C, Turgeon AF; Canadian Traumatic Brain Injury Research Consortion. Low-Value Clinical Practices in Injury Care: A ScoPI:ng Review and Expert Consultation Survey. J Trauma Acute Care Surg. 2019 Jun;86(6):983-993. doi: 10.1097/TA.0000000000002246.
45. Porgo TV, Moore L, Truchon C, Berthelot S*, Stelfox HT, Cameron PA, Gabbe BJ, Hoch JS, Evans DC, Lauzier F, Bernard F, Turgeon AF, Clement J. Patient-level resource use for injury admissions in Canada: a retrospective cohort study. Injury. 2019 Jun;50(6):1192-1201. doi: 10.1016/j.injury.2019.03.038.
46. Hamilton DR, McBeth PB, Greene MR, Kirkpatrick AW, Ball CG. Hypothetical Case of Pancreatitis During a Long Duration Lunar Mission. Aerosp Med Hum Perform. 2019 Jun 1;90(6):570-578

July 2019

47. Kenny Schlosser, Jiapey Wang, Irene Watpool, Duncan J. Stewart , Lauralyn A. McIntyre, John Granton, John Marshall, Claudia dos Santos, Keith R. Walley, Brent W. Winston, Dean A. Fergusson, Shirley H. J. Mei and the Canadian Critical Care Trials Group and the Canadian Critical Care Translational Biology Group. Effects of Mesenchymal Stem Cell Treatment on Systemic Cytokine Levels in Septic Shock Patients. Crit Care Med. 2019 Jul;47(7):918-925. doi: 10.1097/CCM.0000000000003657.
48. Farrier C, Stelfox HT, Fiest KM. In the Pursuit of Partnership: Patient & Family Engagement in Critical Care Medicine. Curr OPI:n Crit Care. 2019 Jul 15. doi: 10.1097/MCC.0000000000000643.

August 2019

49. P. C. Liaw*, A. Fox-Robichaud*, E. McDonald, D. J. Dwivedi, K. L. Liaw, L. Pepler, T. J. Gould, M. Xu, M., N. Zytaruk, L. McIntyre, J. Marshall, J. Tsang, P. M. Dodek, B. W. Winston, C. Martin, D. Fraser, J. I. Weitz, F. Lellouche, and D.J. Cook on behalf of the Canadian Critical Care Translational Biology Group and the Canadian Critical Care Trials Group. Mortality Risk Profiles for Sepsis: A Novel Longitudinal and Multivariable Approach. Crit Care Expl 2019; XXX:e0032. DOI: 10.1097/CCE.0000000000000032.
50. Dipeptidase-1 Is an Adhesion Receptor for Neutrophil Recruitment in Lungs and Liver. Choudhury SR, Babes L, Rahn JJ, Ahn BY, Goring KR, King JC, Lau A, Petri B, Hao X, Chojnacki AK, Thanabalasuriar A, McAvoy EF, Tabariès S, Schraeder C, Patel KD, Siegel PM, Kopciuk KA, Schriemer DC, Muruve DA, Kelly MM, Yipp BG, Kubes P, Robbins SM, Senger DL. Cell. 2019 Aug 22;178(5):1205-1221.e17. doi: 10.1016/j.cell.2019.07.017.
51. Lord JA, Zuege DJ, Palacios Mackay M, Roze des Ordons A, Lockyer J. PI:cking the right tool for the job: a reliability study of four assessment tools for central venous catheter insertion. Journal of Graduate Medical Education 11(4):422-429, 2019.
52. Roze des Ordons A, Gaudet J, Grant V, Harrison A, Millar K & Lord J. Clinical Feedback and Coaching – Be SMART. Clin Teach, 16, Aug, 2019
53. Farhat I, Moore L, Porgo TV, Patton MP, Tardif PA, Truchon C, Berthelot S, Stelfox HT, Gabbe BJ, Hoch JS, Lauzier F, Turgeon AF, Clement J. Resource use for older people hosPI:talized due to injury in a Canadian integrated trauma system: a retrospective multicentre cohort study. Age Ageing. 2019 Aug 22. PI:i: afz097. doi: 10.1093/ageing/afz097.
54. Roze des Ordons A, Sinclair S, Sinuff T, Grindrod-Millar K, Stelfox HT. Development of a clinical guide for identifying sPI:ritual distress in family members of patients admitted to the intensive care unit. J Palliat Med. 2019 Aug 2. doi: 10.1089/jpm.2019.0187.
55. Stelfox HT, Bourgault A, Niven DJ. De-implementing Low Value Care in Critically Ill Patients: A Call for Action - Less is More. Intensive Care Med. 2019 Aug 8. doi: 10.1007/s00134-019-05694-y.
56. Roze des Ordons A, Stelfox HT, Sinuff T, Grindrod-Millar K, Seemann J, Sinclair S. SPI:ritual distress in family members of critically ill patients: perceptions and experiences. J Palliat Med. 2019 Aug 13. doi: 10.1089/jpm.2019.0235.
57. Roberts DJ*, Zygun DA, Ball CG, Kirkpatrick AW, Faris, PD, James MT, Mrklas KJ, Hemmelgarn BD, Manns B, Stelfox HT. Challenges and Potential Solutions to the Evaluation, Monitoring, and Regulation of Surgical Innovations. BMC Surg. 2019 Aug 27;19(1):119. doi: 10.1186/s12893-019-0586-5.
58. Au S, Roze des Ordons A, Ali AA, Soo A, Stelfox HT. Communication with patient families in the intensive care unit: a point prevalence study. J Crit Care. 2019 Aug 29;54:235-238. doi: 10.1016/j.jcrc.2019.08.031.
59. Roze des Ordons AL, Gaudet J, Grant V, Harrison A, Millar K, Lord J. Clinical feedback and coaching – BE SMART. The Clinical Teacher 2019; 16: 1-6.

September 2019

60. McDonald B, and McCoy KD. Maternal microbiota in pregnancy and early life. Science 365(6457):984-985 (2019) DOI: 10.1126/science.aay0618.
61. Lessard Bonaventure P, Lauzier F, Zarychanski R, Boutin A, Shemilt M, Saxena M, Zolfagari P, Griesdale D, Menon DK, Stanworth S, English S, Chassé M, Fergusson DA, Moore L, Kramer A, Robitaille A, Myburgh J, Cooper J, Hutchinson P, Turgeon AF; Canadian Critical Care Trials Group and the Canadian Traumatic Brain Injury Research Consortium. Red blood cell transfusion in critically ill patients with traumatic brain injury: an international survey of physicians' attitudes. Can J Anaesth. 2019 Sep;66(9):1038-1048. doi: 10.1007/s12630-019-01369-w

October 2019

62. Farrier, CE, Stelfox, HT, Fiest, KM. In the pursuit of partnership: patient and family engagement in critical care medicine. Current OPI:nions in Critical Care. Curr OPI:n Crit Care. 2019 Oct;25(5):505-510. doi: 10.1097/MCC.0000000000000643.
63. Tagliabue, G, Ji, M, Suneby Jagers, JV, Zuege, DJ, Kortbeek, JB, Easton, PA. Distinct neural-mechanical efficiency of costal and crural diaphragm during hypercapnia. ResPI:r Physiol Neurobiol. 2019 Oct;268:103247. doi: 10.1016/j.resp.2019.06.004.

64. Tardif, PA, Moore, L, Lauzier, F, Farhat, I, Archambault, P, Lamontagne, F, Chassé, M, Stelfox, HT, Gabbe, BJ, Lecky, F, Kortbeek, J, Lessard-Bonaventure, P, Truchon, C, Turgeon, A. Low-value clinical practices in adult traumatic brain injury: an umbrella review protocol. BMJ Open. 2019 Oct 9;9(10):e031747. doi: 10.1136/bmjopen-2019-031747.
65. McDonald B, Dunbar MJ. Platelets and Intravascular Immunity: Guardians of the vascular space during bloodstream infections and sepsis. Frontiers in Immunology 11 October 2019 | https://doi.org/10.3389/fimmu.2019.02400.
66. Stelfox HT, Bourgault AM, Niven DJ. De-implementing low-value care in critically ill patients: a call to action. Intensive Care Med. 2019 Oct;45(10):1443-1446. doi: 10.1007/s00134-019-05694-y
67. Berthelot S*, Lang ES, Quan H, Stelfox HT. Canadian in-hosPI:tal mortality for patients with emergency-sensitive conditions: a retrospective cohort study. BMC Emerg Med. 2019 Oct 22;19(1):57. doi: 10.1186/s12873-019-0270-1.
68. Sauro KM, Soo A, Quan H, Stelfox HT. Adverse Events Among HosPI:talized Critically Ill Patients: A Retrospective Cohort Study Med Care. 2019 Oct 29. doi: 10.1097/MLR.0000000000001238.
69. Roze des Ordons AL, MacIsaac L, Everson J, Hui J, Ellaway R. Compassion in the clinical context: constrained, distributed and adaptive. J Gen Intern Med. 2019 Oct 21. doi: 10.1007/s11606-019-05467-9.

November 2019

70. Montgomery CL, Zuege DJ, Rolfson DB, Opgenorth D, Hudson D, Stelfox HT, Bagshaw SM. Implementation of Population-Level Screening for Frailty Among Patients Admitted to Adult Intensive Care in Alberta, Canada. Can J Anaesth. 2019 Nov;66(11):1310-1319. doi: 10.1007/s12630-019-01414-8
71. Wiebe N, Varela LO, Niven DJ, Ronksley PE, Iragorri N, Quan H. Evaluation of interventions to improve inpatient hosPI:tal documentation within electronic health records: A Systematic Review. J Am Med Inform Assoc. 2019 Nov 1;26(11):1389-1400. doi: 10.1093/jamia/ocz081.
72. Doig CJ, Girard L, Jenkins D. Thrombotic thrombocytopenic purpura masquerading as a stroke in a young man. CMAJ 2019 November 25;191:E1306-9. doi: 10.1503/cmaj.190981
73. Zochios V, Chandan JS, Schultz MJ, Morris AC, Parhar KK, Giménez-Milà M, Gerrard C, Vuylsteke A, Klein AA. The Effects of Escalation of ResPI:ratory Support and Prolonged Invasive Ventilation on Outcomes of Cardiac Surgical Patients: A Retrospective Cohort Study. J Cardiothorac Vasc Anesth. 2019 Nov 8. PI:i: S1053-0770(19)31129-2. doi: 10.1053/j.jvca.2019.10.052.
74. Bandeali S, Roze des Ordons AL, Sinnarajah A. Comparing the physical, psychological, social and sPI:ritual needs of patients with non-cancer and cancer diagnoses in a tertiary palliative care setting. Palliat Supp Care. 2019 Nov 27. doi: 10.1017/S1478951519001020.

December 2019

75. Cavanagh, N, Crockett, G, Heinrich, C, Doig, L, Fiest, KM, Guichon, J, Page, S, Mitchell, I & Doig, C. Compassion Fatigue in Health Care Providers: a systematic review and meta-analysis. Nurs Ethics. 2019 Dec 12:969733019889400. doi: 10.1177/0969733019889400.
76. Honarmand, K, Um, KJ, Belley-Cote, EP, Alhazzani, W, Farley, C, Fernando, SM, Fiest, KM, Grey, D, Hadjini, E, Herridge, M, Hrymak, C, Moller, MH, Kanji, S, Lamontagne, F, Lauzier, F, Mehta, S, Paunovic, B, Singal, R, Tsang, JLY, Wynne, C, & Rochwerg, B. CCCS clinical practice guideline: Vasopressin for adult patients with distributive shock. Can J Anaesth. 2019 Dec 3. doi: 10.1007/s12630-019-01546-x.
77. Garcia, DFV, Domingues, CA, Collet E Silva, Mori, ND, Brasel, KJ, Kortbeek, J, Ali, J, Poggetti, RS. Efficacy of a Novel Surgical Manikin for Simulating Emergency Surgical Procedures. The American Surgeon, Volume 85, Number 12, December 2019, pp. 1318-1326(9)
78. Parsons Leigh J, Petersen J, de Grood C, Whalen-Browne L, Niven D, Stelfox HT. MapPI:ng structure, process and outcomes in the removal of low-value care practices in Canadian intensive care units: protocol for a mixed-methods exploratory study. BMJ Open. 2019 Dec 16;9(12):e033333. doi: 10.1136/bmjopen-2019-033333.
79. Hennessy D, Soo A, Niven DJ, Jolley R, Posadas J, Stelfox HT, Doig CJ. Sociodemographic Characteristics Associated with HosPI:talization for Sepsis in Canada: a Census Linked Cohort Study. Can J Anesthesia 67(4) · Dec 2019. DOI: 10.1007/s12630-019-01536-z
80. Parhar KK, Solverson K, Zochios V. Early neuromuscular blockade in acute resPI:ratory distress syndrome: to personalize or paralyze? J Thorac Dis 2019;11(12):5701-5705. doi: 10.21037/jtd.2019.12.101
81. Bowker SL, Stelfox HT, Bagshaw SM on behalf of the Critical Care Strategic Clinical Network. Critical Care Strategic Clinical Network (CC SCN): A Learning Healthcare System. CMAJ. 2019 Dec 4;191(Suppl):S22-S23. doi: 10.1503/cmaj.190578.
82. Sauro KM, Ghali W, Stelfox HT. Measuring safety of healthcare: An exercise in futility? BMJ Quality & Safety. 2019 Dec 03e. doi: 10.1136/bmjqs-2019-009824
83. De Grood* C, Stelfox HT, Whalen-Browne L, Niven DJ, Petersen J, Parsons Leigh J. Roberts DJ MapPI:ng Structure, Process and Outcomes in the Removal of Low-Value Care Practices in Canadian Intensive Care Units: Protocol for a Mixed-Methods Exploratory Study. BMJ Open. 2019 Dec 16;9(12):e033333. doi: 10.1136/bmjopen-2019-033333.
84. Roberts DJ, Stelfox HT, Moore LJ, Cotton BA, Holcomb JB, Harvin JA. Accuracy of published indications for predicting use of damage control during laparotomy for trauma. J Surg Res. 2019 Dec 18;248:45-55. doi: 10.1016/j.jss.2019.11.010.
85. Bush S, Chary S, Roze des Ordons A, Taylor K, Boyle A. The development and validation of updated palliative and end-of-life care competencies for medical undergraduates in Canada. J Palliat Med. 2019. doi:10.1089/jpm.2019.0160
86. Randomized Controlled Trial. Netzer I, Kirkpatrick AW, Nissan M, McKee JL, McBeth PB, Dobron A, Glassberg E. Telemed J E Health. Telemed J E Health. 2019 Nov;25(11):1108-1114. doi: 10.1089/tmj.2018.0173.
87. Dube M, Jones B, Kaba A, Novick RJ, Ferland A. Preventing harm, testing and implementing health care protocols using simulation-based approaches. Clin Simul Nurs. https://doi.org/10.1016/j.ecns.2019.10.006

Abstracts

January 2019

1. Metwaly, S., Vogel, H., Winston, B.W. & the Canadian Critical Care Translational Biology Group (CCCTBG). Potential ARDS Molecular Mechanism Identified by Metabolomics. Presented to the CCCTBG in Lake Louise, Jan. 2019.
2. Mohammad Mehdi Banoei, Brittany Scott, Ryan Groves, Paul Kubes, Ian Lewis, Jamie Hutchison, Douglas Fraser, Hans Vogel, Beata Mickiewicz and Brent W. Winston, for the Canadian Critical Care Translational Biology Group and the CTRC. Severe traumatic brain injury: metabolomics analysis of human and mouse studies. Presented to the CCCTBG, Jan 2019 Lake Louise Meeting.
3. Mohammad M. Banoei; Lauralyn A. McIntyre; Duncan J. Stewart; Shirley H. J. Mei; David Courtman; Irene Watpool; John Granton; John Marshall; Claudia dos Santos; Keith R. Walley; Kenny Schlosser; Dean A. Fergusson; and Brent W. Winston, For the Canadian Critical Care Trials Group and the Canadian Critical Care Translational Biology Group. Metabolomics of MSC therapy for septic shock. Presented at the CCCTBG Meeting, Jan 2019 Lake Louise.

February 2019

4. Mann B*, Solverson KJ, Hazlewood GS, Bagshaw SM, Straus SE, James MT, Niven DJ. Initial Renal Replacement Modality and Renal Recovery in AKI: A Network Meta-Analysis. 2019 Society of Critical Care Medicine Congress, February 17-20, 2019, San Diego, CA, USA (Research snapshot presentation)
5. Niven DJ, Barnes TRM, Soo A, Gaudet JE, Fiest KM, Doig CJ, Stelfox HT, Parhar KS. The Clinical Effects of Echocardiography in Patients with Hypoxemic ResPI:ratory Failure. 2019 Society of Critical Care Medicine Congress, February 17-20, 2019, San Diego, CA, USA. (Research snapshot presentation)
6. Lord J, Gaudet J, Eng R, Ellaway R, Adegbesan C, Pokharel S & Millar K Physician Perceptions Regarding Transition to Competence by Design: Mind the Gap. OHMES Symposium, Calgary, AB. 2019

March 2019

7. Niven DJ, Soo A, Bagshaw S, Duggan S, Meier M, Zygun D, Karvellas CJ, Townsend DR, Carney D, Rokosh E, Suen G, Davidow J, Zibdawi M, Stelfox T. Reducing inappropriate use of Human Albumin Solutions in Critically Ill Adults: A Multi-centre Knowledge Translation Initiative. Choosing Wisely Alberta Symposium, March 18th 2019. Calgary, AB, Canada. (Oral Presentation)
8. Niven DJ; McCormick TJ, Barnes T, Fiest K, Straus S, Hemmelgarn BR, Jeffs LP, Stelfox T. Understanding the Reproducibility of Randomized Controlled Trials in Critical Care: A Systematic Review. Choosing Wisely Alberta Symposium, March 18th 2019. Calgary, AB, Canada. (Poster presentation)
9. Niven D, Barnes T, Soo A, Gaudet J, Fiest KM, Doig C, Stelfox HT, Parhar K. (2019). The Clinical Effects Of Echocardiography In Patients With Hypoxemic ResPI:ratory Failure. Oral Presentation.Critical Care Medicine. Critical Care Congress 48., San Diego, United States (477). Critical Care Medicine. Conference Date: 2019/2

April 2019

10. Lord J, Gaudet J, Eng R, Ellaway R, Adegbesan C, Pokharel S & Millar K. Anticipating Competence by Design: faculty and resident perspectives. CCME, Niagara Falls, On. 2019
11. Esmail R, Clement F, Stelfox HT, Fullmer S. Knowledge Translation (KT) and Health Technology Reassessment (HTR): Unravelling the black box! CADTH 2019 Conference, April 14-16, 2019, Edmonton, AB, Canada.

May 2019

12. Mohammad M. Banoei, Hans J. Vogel, Aalim M. Weljie, Sachin Yende, Derek Angus and Brent W. Winston. Prognosis of mortality in bacterial Community Acquired Pneumonia (CAP) using metabolomics (Fatty acids and liPI:ds) as potential biomarkers. ATS Annual Conference, May 2019.
13. Mohammad M. Banoei, Hans J. Vogel, Aalim M. Weljie, Sachin Yende, Derek Angus and Brent W. Winston. Prognosis of mortality in bacterial Community Acquired Pneumonia (CAP) using metabolomics (Fatty acids and liPI:ds) as potential biomarkers. ATS Annual Conference, May 2019.
14. Winston, B.W., Metwaly, S., Banoei, M.1, Donnelly, S., Mourad, A., Vogel, H., Fiehn, O. & the Canadian Critical Care Translational Biology Group (CCCTBG). Using Metabolomics to Predict ARDS Mortality. ATS Annual Conference, May 2019.
15. Mohammad M. Banoei, Brittney N. Scott, Ryan Groves, Paul Kubes, Ian Lewis, Brent W. Winston. Profiling of known metabolites related to severe traumatic brain injury (sTBI) in human and mouse model. Presented May 2019 at the Canadian Metabolomics Conference, Canmore 2019.

June 2019

16. Thanh T, Chen G, Zygun D, Zuege D, Stelfox HT, Bagshaw SM. Healthcare Costs Of Strained Intensive Care Unit Capacity. Presented at HTAi Annual Meeting Cologne, Germany June 2019.
17. Martin GR, Henare K, Salazar C, Scheidl-Yee T, Eggen LJ, Tailor PP, Kim JH, Podstawka J, Fritzler MJ, Kelly MM, Yipp BG, Jirik FR. Expression of a constitutively active human STING mutant in hematopoietic cells produces an Ifnar1-dependent vasculopathy in mice. Life Sci Alliance. 2019 Jun 20;2(3). PI:i: e201800215. doi: 10.26508/lsa.201800215.

July 2019

18. K. Parhar, D. Niven, HT. Stelfox, G. Rubenfeld, C. Doig, K. Fiest, A.Soo. ResPI:ratory rate is associated with mortality in ARDS patients: An ancillary analysis of the Calgary ARDS observational cohort. Intensive Care Medicine Experimental 2019, 7(Suppl 3):001289

August 2019

19. Choudhury SR, Babes L, Rahn JJ, Ahn BY, Goring KR, King JC, Lau A, Petri B, Hao X, Chojnacki AK, Thanabalasuriar A, McAvoy EF, Tabariès S, Schraeder C, Patel KD, Siegel PM, Kopciuk KA, Schriemer DC, Muruve DA, Kelly MM, Yipp BG, Kubes P, Robbins SM, Senger DL. Dipeptidase-1 Is an Adhesion Receptor for Neutrophil Recruitment in Lungs and Liver. Cell. 2019 Aug 22;178(5):1205-1221.e17. doi: 10.1016/j.cell.2019.07.017.
20. Kassam A, Ellaway R, Gaudet J, Millar K, Pokharel S & Lord J. Ready or Not? Perceptions of Faculty and Residents about the Transition to Competence by Design (CBD). Association of Medical Education of Europe (AMEE) Conference, Vienna, Austria, August 24th-28th, 2019

September 2019

21. Kassam A, Ellaway R, Millar K, Gaudet J, Pokharel S, Eng R, Pokharel S, Adegbesan C, Soo A & Lord J. Faculty and Resident Perceptions Regarding Transition to Competence by Design at the University of Calgary – The Devil is in the Details. ICRE, Ottawa, ON. 2019

October 2019

22. Bagshaw SM, Niven D, Soo A, Harris J, Mathew S, Sargento A, Agyemang M, Zuege DJ. Development and Validation of an Electronic Algorithm to Detect Clinically Significant Gastrointestinal Bleeding Events in Alberta, Canada. Presented at World Congress of Intensive Care Medicine, Melbourne, Australia, Oct 2019. (Best Safety & Quality Paper Award, ANZICS)
23. Amarbayan M, Whalen-Browne L, Brundin-Mather R, Kashyap D, Sauro KM, Soo A, Parsons Leigh J, Stelfox T. Assessment of an ICU-specific, electronic medical summary tool against traditional dictation to reduce communication gaps during ICU-to-inpatient transitions-in-care. Poster presented at: CASCH Campus Alberta Student Conference on Health; 2019 Oct 4-5; Edmonton, AB

November 2019

24. Zuege DJ, Niven D, Soo A, Harris J, Mathew S, Sargento A, Agyemang M, Bagshaw SM. Clinically Significant Gastrointestinal Bleeding Events: Development and Validation of an Electronic Detection Algorithm and Application in a Population-Based Retrospective Cohort Study of Adult Critically Ill Patients in Alberta. Presented at Canadian Critical Care Forum, Toronto, Nov 2019.
25. Hessey E, Montgomery C, Zuege D, Rolfson D, Stelfox HT, Bagshaw S. Sex-Specific Prevalence, Correlates and Outcomes of Frailty in Critically Ill Patients. Presented at Canadian Critical Care Forum, Toronto, Nov 2019.
26. Morrissey J, Bowker SL, Sinnadurai S on behalf of the Alberta Critical Care Strategic Clinical Network (D Zuege Medical Director). Driving clinical best practice through a provincial audit and feedback approach: Alberta's ICU Delirium Initiative. Presented at Canadian Critical Care Forum, Toronto, Nov 2019.
27. Sinnadurai S, Bowker SL, Morrissey J on behalf of the Alberta Critical Care Strategic Clinical Network (D Zuege Medical Director). Advancing Implementation Science in Alberta's Critical Care Community and Supporting a Learning Health System through Collaboration: The Provincial ICU Delirium Initiative. Presented at Canadian Critical Care Forum, Toronto, Nov 2019
28. Granton E, Kim JH, Podstawka J, Yipp BG. The Lung Microvasculature Is a Functional Immune Niche. Trends Immunol. 2018 Nov;39(11):890-899. doi:10.1016/j.it.2018.09.002.
29. Rosgen B*, Krewulak K, Stelfox HT, Ely EW, Davidson JE, Fiest KM. Is caregiver-detected delirium associated with symptoms of depression and anxiety in caregivers of the critically ill? Leaders in Medicine Symposium. Cumming School of Medicine. November 8, 2019.
30. Netzer I, Kirkpatrick AW, Nissan M, McKee JL, McBeth P**,** Dobron A, Glassberg E1. Rubrum Coelis: The Contribution of Real-Time Telementoring in Acute Trauma Scenarios-A Randomized Controlled Trial. Telemed J E Health. 2019 Nov;25(11):1108-1114. doi: 10.1089/tmj.2018.0173.

December 2019

31. Wierstra B, Rommens KL, Cantle P, Au S. Arterial placement of central venous catheters: a teachable moment. Accepted in Canadian Journal of Internal Medicine.