# CAEP EMERGENCY ULTRASOUND COMMITTEE
# SPECIAL ICEM 2025 NEWSLETTER


**Greetings POCUS Enthusiasts,**

**Welcome to the special ICEM 2025 newsletter! With international presenters and global emergency medicine topics, ICEM 2025 promises to be an exciting conference. The program includes many POCUS-related presentations and of course the highly anticipated POCUS Games. Look ahead in the newsletter for your ICEM 2025 POCUS guide.**

**See you all there!**

-Talia Burwash-Brennan

## In this newsletter:


**POCUS-Related Events**

**POCUS Games Information**

**Canadian POCUS Abstracts**


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# ICEM 2025 POCUS-Related Presentations & Events

**Sunday May 25th 2025**

**PoCUS Competition - Qualifying Rounds**

Room: 220A 11:10 am -12:30 pm

**Hard Core EM: Just the Facts**

**Seeing is Believing (or is it?)** Room: 510AC 2:35 -3:00 pm
Presenter(s): Paul Atkinson

**PoCUS Competition – Final Round**

Room: 220A 3:40- 5:00 pm

**Research in EM**

**Does emergency physician use of POCUS affect radiology imaging rates in patients presenting to the ED with acute abdominal or flank pain? (LO20)**

Room: 515ABC 4:10-4:20 pm
Presenter(s): Elyssia Adamo, Rory Connolly, Sophia-Maria Giannakakis, Edmund S.H. Kwok, Michael Woo, Krishan Yadav

**Enhancing provider expertise: a point-of-care lung ultrasound curriculum for Nepali pediatricians to identify lung pathology in children (LO21)**

Room: 515ABC 4:20-4:30 pm
Presenter(s): Alicia Genisca, Suraj Bhattarai, Blaine Grant, Dhruba Shreshtha, Erika Constantine

**First Trimester Point of Care Ultrasound: Emergency Physician Image Review Processes and Case Variables Associated with Diagnostic Accuracy (LO23)**

Room: 515ABC 4:40-4:50 pm
Presenter(s): Kathy Boutis, Gillian Sheppard, Lori Stolz, Jeremy Boyd, Martin Pusic, Jessica Baez, Minges Patrick, Mathew Swarm, Megan Hilbert, Marisa O'Brien, Katie Marie Harris, Catherine Varner, Constance LeBlanc

**First pass success rate for guide wire placement in central venous catheterization of internal jugular vein using ultrasound versus anatomical landmark in the emergency department - A randomized study (LO24)**

Presenter(s): Sabiha Naz, Room: 515ABC 4:50- 5:00 pm

**Research in EM**

**Poster Viewing** Room 210CG 5:00-6:00 pm

**Aeyeball: applying Machine Learning to Ocular Point of Care Ultrasound (PO61)**
Presenter(s): Keren Shahar-Nissan, Balagopal Unnikrishnan, Ryan C. Daniel, Lianne McLean, Devin Singh

**A retrospective cohort study of quality of CT chest reporting and association with delivering of regional anaesthesia for traumatic rib fractures (PO134)**
Presenter(s): Salman Naeem, Luke Peacock, Syme Bhopal, Grace Catchpole, Ammar Habbal, James Bearman, Ahmed Hassan, Drew Gordon, Simrik Sunuwar, Adriana Gonzalez, Hafsa Ali, Mohammed Dafalla, Mahika Kamat, Mehdin Shah, Anna Vondy, Samuel Harding, Hassan Ahmed, Serena Rovida

**Sonographic assessment of fasting – emergency room sedations (PO136)**
Presenter(s): Sean Park, Colin Bell, Lindsey Berthelsen

**Gastric Point-of-Care Ultrasound Applications in the Emergency Department and Intensive Care Unit: A Scoping Review (PO137)**
Presenter(s): Saad Razzaq; Rami Hamoudeh, Malick Turenne, Astha Chandra, Emily R. Martin, Joel Turner

**The utility of a point-of-care ultrasound-enhanced quick sequential organ failure assessment (qSOFA) scoring in the recognition of sepsis at the emergency department: a single center study (PO138)**
Presenter(s): Stephanie Kaye Asuncion Cala, Romulo III Brazil Babasa

**Early utilization of point-of-care ultrasound for emergency patient resuscitation: Mixed-methods study in a tertiary care academic center, Addis Ababa, Ethiopia (PO139)**
Presenter(s): Temesgen Beyene Beyene, Tikur Anbassa

**Accuracy of point of care ultrasound in diagnosis of deep venous thrombosis and pulmonary embolism among critically ill patients at tertiary hospitals in Addis Ababa Ethiopia (PO140)**
Presenter(s): Dessalegn Keney Guddu, Dereje Bayissa Demissie

**Improving the utalization of point of care ultrasound in emergency patient resuscitations at tertiary care academic hospital, Addis Ababa, Ethiopia (PO143)**
Presenter(s): Temesgen Beyene Beyene, Tikur Anbassa

**Can a short course improve user confidence in utilising ultrasound technology for venous cannulation (PO144)**
Presenter(s): Christopher Griffiths, Samer Elkhodair

**How can EM POCUS tackle rheumatic heart disease in Ethiopia? (PO145)**
Presenter(s): Kanisha Cruz-Kan; Muzeen Ismath; Hannah Girdler, Tigist Zewdu, Temesgen Beyene Beyene, Tikur Anbassa Inderjeet Singh Sahota

**Asynchronous simulation-based training of resuscitative transesophageal echocardiography in emergency physicians (PO146)**
Presenter(s): Kavish Chandra, Rawan Makhdom, Kiera Dolan, Rajiv Thavanathan, Pamela McDougall, Paul Atkinson, David Lewis

**Emergency provider perspectives on the utility of minor zone point-of-care ultrasound scans. (PO147)**
Presenter(s): Sara Brade, Lindsey Karmen, Jordan Chenkin

**Surveying point of care ultrasound usage in emergency medicine by Ethiopian emergency physicians: a national needs assessment (PO148)**
Presenter(s): Hannah Girdler, Temesgen Beyene Beyene, Tikur Anbassa, Julia Wytsma; Tigist Zewdu, Inderjeet Singh Sahota

**A randomised controlled trial comparing ultrasound-guided pericapsular nerve group (PENG) block with intravenous morphine administration in reducing pain in older adults with hip fractures admitted to the emergency department (PO149)**
Presenter(s): Jiraporn Sri-on, Fusakul, Pornsiri Kanokkarnchana, Krit Phisaiphun, Pacharee Piyachan, Kitchai Luksameearunothai

# ICEM 2025 POCUS-Related Presentations & Events (Continued)

**Monday May 26th 2025**

**Educational Marketplace** Room: 220A 10:00 am- 1:00 pm

**POCUS-guided nerve block**
Presenter(s): David Lewis, Colin Bell, Ghaida Alsuhaibani, Katie Lin

**Resuscitative POCUS-guided decisions**
Presenter(s): Inderjeet Singh Sahota, Sandeep Balanrao Gore, Dessalegn Keney Guddu, Ian Chernoff

**Ultrasound-guided regional block: alternative pain management for older adults**
Presenter(s): Whitney K. Bryant, Ankur Verma, Jiraporn Sri-on, Paulo Roberto Figueroa Junior

**Valvular emergencies: ultrasound-guided management**
Presenter(s): Effie Polyzogopoulou

**Hard Core EM: Just the Facts**
**Go with the Flow - high yield POCUS applications that will improve departmental flow**
Presenter(s): Paul Olszynski Room: 510AC 11:30- 11:55 am

**International & Global EM**
**Shaping the Future of EM: Leadership, Research, and PoCUS in Global Education**
Room: 511BE 4:30- 4:50 pm
Presenter(s): Temesgen Beyene Abicho, Jennifer Bryan, Inderjeet Singh Sahota, Anna Karolina Nowacki

**Research in EM**
**Poster Viewing** Room 210CG 5:00-6:00 pm

**Single shot intertransverse process plane block for a ninety-year-old male with multiple displaced rib fractures using the Yale-Li regional protocol in the emergency department. A case report. (PO220)**
Presenter(s): Nancy Isaac, Michael Polischuk, Viththeagan Yohathasan

**Pecto-intercostal fascia plane nerve blocks and point of care ultrasound to diagnose and treat costal cartilage fractures after cardiopulmonary resuscitation in the emergency department. A case report. (PO222)**
Presenter(s): Viththeagan Yohathasan, Michael Polischuk, Nancy Isaac

**Ultrasound-Guided Training on Fascia Iliaca Compartment Block (FICB) and Pericapsular Nerve Group (PENG) Block for 5th-Year Medical Students Using Soft Cadavers (PO226)**
Presenter(s): Thitarat Worawiwat, Jiraporn Sri-on, Alissara Vanichkulbodee, Pacharee Piyachan, Kulwiwat Pakjilayuwat, Worawit Vanichkulbodee, Shan Woo Liu

**Barriers to Routine Use of Fascia Iliaca Blocks for Pain Management: A Comparison Between a Resource-Rich and a Resource-Limited Setting (PO227)**
Presenter(s): Halley J. Alberts, Heather Brown, Caroline Brady, Laura Nolting, Singatiya Chikumbanje, Karen Chetcuti, Patrick Nachipo, Limbani Mapata

**A retrospective cohort study investigating feasibility and impact of delivery of out-of-theatres regional anaesthesia for traumatic rib fractures. (PO284)**
Presenter(s): Salman Naeem, Syme Bhopal, Grace Catchpole, Ammar Habbal, James Bearman, Ahmed Hassan, Drew Gordon, Simrik Sunuwar, Adriana Gonzalez, Hafsa Ali, Mohammed Dafalla, Mahika Kamat, Mehdin Shah, Hassan Ahmed, Anna Vondy, Samuel Harding, Serena Rovida

**Tuesday May 27th 2025**

**CAEP EUC Annual Meeting**
Open to all Room: 512DH 10:00-11:00 am

**Hard Core EM: Just the Facts**:
**PoCUS Pokes** Room: 510AC 11:10-11:35 am
Presenter(s): Dr Claire Heslop

**Research in EM** :
**Evaluating the East African point-of-care ultrasound training program: lessons learned and best practices (MP10)**
Room 220A 1:45-2:25 pm Presenters: Hannah Girdler, Temesgen Beyene Beyene, Tigist Zewdu, Inderjeet Singh Sahota

**POCUS B.A.D.G.E Buddy - Bringing Advances in Diagnostic Guidance and Education with Point-of-Care Ultrasound (MP12)**
Room 220A 1:45-2:25 pm
Presenters: Noa Kvatinsky, Danielle Aerin Sweetnam Holmes, Maya Harel-Sterling, Gili Palnizky Soffer

**Hard Core EM: Just the Facts**
**Ready for your TEE Time?** Room 510AC 2:10-2:35 pm
Presenters: David Lewis

**Research in EM**
**Lightning Oral**
**Association between area of maximal compression determined by transesophageal echocardiography and survival during cardiac arrest resuscitation (LO85)**
Presenters: Felipe Teran Merino Room 515ABC 4:20-4:30 pm

**Identifying barriers to using point-of-care ultrasound to perform pulse checks in cardiopulmonary resuscitation among multidisciplinary healthcare providers. (LO86)**
Room 515ABC 4:30-4:40 pm
Presenters: Lindsey Karmen, Jordan Chenkin, Sara Brade, Robert Simard

# ICEM 2025 POCUS-Related Presentations & Events (Continued)

## Tuesday May 27th 2025

**Research in EM**
**Moderated Poster** Room 220A 4:20-5:00pm

**Nursing ultrasound guided peripheral intravenous access: a quality improvement project**
Presenters: Nathaniel Murray, Simeon Mitchell, Edmund S.H. Kwok, Michael Woo, Laura Fagan, Jennifer Payne

**Assessing Outcomes of Point of Care Ultrasound Use in Testicular Torsion in a Pediatric Emergency Department**
Presenters: Tasuku Takadera, Charlene Rodis Bularan, Sarathy Jordan Kanathasan, Horton Lee

**Research in EM**
**Poster Viewing** Room 210CG 5:00-6:00 pm

**An exploratory case series of the incidence of intracardiac thrombosis among Filipino cardiac arrest patients (PO332)**
Presenters: Shane Del Rosario Chug-Pili,Kingsley Macaire Sze Shi, Moira Madelle Cruz Mañalac, Gideon Gamboa Villar, Franklin John Co Yap, Romulo III Brazil Babasa

**Implementation of prehospital point-of-care ultrasound using a novel continuous feedback approach in a UK helicopter emergency medical service (PO354)**
Salman Naeem, Shadman Aziz, Thomas Hirst, Johannes Strobel, Jamin Mulvey, Ailidh Lang, Jankee Patel, Alexander Smith, Jun Cheng, Michael Palmer, Jonas Schlautmann, Michael Christian, Daniel Nevin

**Addition of point of care ultrasound to a paramedic difficult intravenous access team in the emergency department: The P-IVPOCUS study (PO384)**
Presenters: Ryan Fitzpatrick, Megi Nallbani, Janet MacIntyre, Mary-Lynn Watson, Michael Butler, Sam G. Campbell

**Ultrasound in pediatric emergency medicine simulation: Evaluation of a longitudinal curriculum (PO421)**
Presenters: Hadas Katz-Dana, Dana Singer-Harel, Elana Thau, Maduomethaa Pathmaraj, Laura Simone, Paul Olszynski; Jonathan Pirie, Maya Harel-Sterling

**Effectiveness of a flipped classroom model for teaching emergency physicians how to recognize signs of massive pulmonary embolism using point-of-care ultrasound: A randomized controlled study (PO429)**
Presenters: Jordan Chenkin, Noman Ali, Robert Simard, Dominick Shelton

**A Focused Training Intervention on Ultrasound-Guided Regional Nerve Blocks for Pain Management in Low-Resource Settings (PO432)**
Presenters: Halley J. Alberts, Heather Brown, Caroline Brady, Nolting, Singatiya Chikumbanje, Karen Chetcuti, Patrick Nachipo, Limbani Mapata

**Consensus recommendations for integrating point of care ultrasound technology in undergraduate medical education from the 2024 Seguin Canadian Ultrasound Education Conference (PO442)**
Presenters: Saad Razzaq, Eadan Farber, Olivier Nguyen, André Denault

**A qualitative study evaluating perceptions, ultrasound use, and perceived barriers of a longitudinal multidisciplinary healthcare provider point of care ultrasound training course in The Gambia (PO444)**
Presenters: Juliette Gerardo, Erin Cloos, Lamin Jaiteh, Christine McBeth

**From Clay to Clinical Practice: Developing POCUS-Compatible Task Trainers (PO452)**
Presenters: Tasuku Takadera, Danielle Aerin, Sweetnam Holmes, Patrick Jad Akkad, Maya Harel-Sterling

**Ultrasound measured lung excursion in acute asthma exacerbation: a case report (PO464)**
Presenters: Joseph Wong Say Wei, Chiao Hao Lee

## Wednesday May 28th 2025

**PoCUS**

**POCUS in Pediatric Emergencies: Approach to the Critically-Ill Child**
Room: 510AC 11:10-11:30 am

Presenter(s): Maya Harel-Sterling, Lianne McLean

**Go With The Flow: Intro to POCUS Valve Assessment**

Presenter(s): Rajiv Thavanathan Room: 510AC 11:30-11:50 am

**Expanding the Role of PoCUS in Diagnosing Disseminated TB: The eFASH Approach**

Presenter(s): Craig Brian Beringer Room: 510AC 11:50-12:10 pm

**Top 5 POCUS Papers You Should Know From 2024**

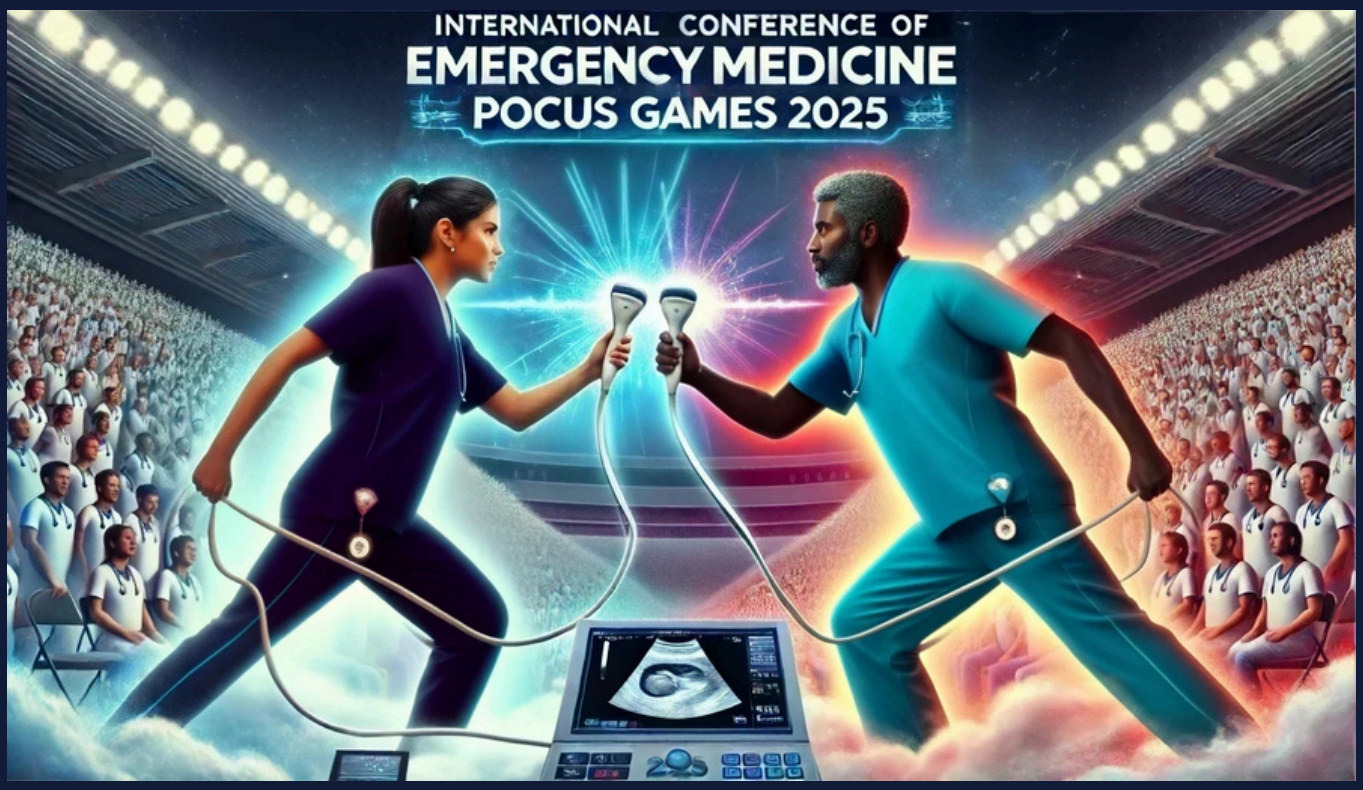
Presenter(s): Daniel Kim Room: 510AC 12:10-12:30 pm

# ICEM 2025 POCUS Games

**Sunday May 25th 2025** **Room: 220A**

**PoCUS Games- Qualifying Rounds** **11:10 am -12:30 pm**

**PoCUS Games - Final Round** **3:40 pm- 5:00 pm**




See you there!

# ICEM 2025: CANADIAN POCUS ABSTRACTS

Adamo E, Connolly R, Giannakakis SM, Kwok ESH, Woo M, Yadav K. **Does emergency physician use of POCUS affect radiology imaging rates in patients presenting to the ED with acute abdominal or flank pain.** Introduction: Point-of-Care Ultrasound (POCUS) is a readily accessible tool for assessing emergency department (ED) patients with abdominal pain, but the impact of POCUS use on radiology-performed imaging is unknown. Our objective was to identify the impact of high-frequency POCUS users on the rate of computed tomography (CT) and radiology-performed ultrasound (RADUS) for acute abdominal pain. Methods: We conducted a health records review of adults (age ≥18 years) who presented to two large tertiary care EDs from June 1, 2021, to May 31, 2022, with abdominal or flank pain and were discharged home. Patients were excluded if they were admitted to hospital or had ED visits or imaging for abdominal pain in the prior 6 months. POCUS is listed as a physician service in the schedule of benefits for Ontario. Using this data, high frequency POCUS users were defined as emergency physicians who submitted this provided physician service to the Ontario Health Insurance Plan for at least 10% of their patient encounters during the study period. The chi-square statistic was used to determine if there was an association between POCUS users and (a) abdominal CT (primary outcome) and (b) RADUS. A p-value <0.05 was considered statistically significant. Results: There were 337 patients included (mean age 48.8 years, 60.8% female). When compared with low-frequency POCUS users (72/85), patients seen by high-frequency POCUS users (13/85) were less likely to have an abdominal CT scan (46.21% vs 31.67%, 95%CI 0.70 – 28.38; p=0.04) and a CT or RADUS (59.93% vs 40.00%, 95%CI 6.08–33.77%; p=0.005). There was no statistically significant difference between low- and high-frequency POCUS users for RADUS (16.97% vs 11.67%; p=0.31), outpatient imaging (5.42% vs 6.67%; p=0.70) or return ED visits within 14 days (9.02% vs 15.00%; p=0.16). Conclusions: This is the first study to assess the impact of high-frequency POCUS users on the rate of CT and RADUS for ED patients with acute abdominal or flank pain. Emergency physicians who are high-frequency POCUS users order fewer abdominal CT scans. This indicates a potentially substantial health system and patient benefit, resulting from decreased CT imaging rates with widespread adoption of POCUS.

Brade S, Karmen L, Chenkin J. **Emergency provider perspectives on the utility of minor zone point-of-care ultrasound scans**. Introduction: Point-of-care ultrasound (POCUS) training in emergency medicine residency programs often focuses on scans for critically ill patients. Training is less focused on minor zone scans, such as those for ocular and musculoskeletal (MSK) issues. This study aimed to evaluate emergency providers' comfort levels and interest in learning minor zone POCUS scans, as well as barriers to their adoption. This survey will be used to inform a minor zone POCUS workshop. Methods: We conducted a cross-sectional survey of emergency providers, including physicians, residents, and physician assistants across multiple urban emergency departments in the Greater Toronto Area. Participants were invited by email to complete a survey (Google Forms) that included multiple choice, 5-point Likert scale questions, and open-ended questions. The survey explored prior POCUS experience, perceived utility of minor zone POCUS applications, and barriers to use. Responses were analyzed using descriptive statistics. Results: 45 providers completed the survey (24% response rate), including practicing emergency physicians (68%), residents (30%), and physician assistants (1%). Most respondents (59%) had less than 5 years of clinical experience. Most respondents reported an intermediate level of prior POCUS experience (62%), with 24% advanced and 11% expert. 57% of respondents reported no prior formal training for ocular POCUS, and 86% reported no prior formal training for MSK POCUS. 51% of respondents reported prior formal training for POCUS-guided peripheral nerve blocks. Most respondents reported excellent or good access to POCUS training at their institution; however, 11% reported limited access. Respondents expressed the lowest comfort with and highest interest in learning POCUS-guided peripheral nerve blocks (70% reported low comfort; 84% reported high interest). Other scans with reported low to mixed comfort levels and high interest levels included POCUS for soft tissue foreign bodies (64% low to moderate comfort; 71% high interest) and joint effusions (67% low to moderate comfort; 80% high interest). Conclusion: Despite being highly trained in POCUS, emergency providers report varied comfort levels with minor zone POCUS scans. High interest in specific applications such as peripheral nerve blocks highlight the need for targeted educational initiatives. Addressing barriers such as limited access to training may enhance the use of minor zone POCUS scans in practice.

# ICEM 2025: CANADIAN POCUS ABSTRACTS (CONTINUED)

Boutis K, Sheppard G, Stolz L, Boyd J, Pusic M, Baez J, Patrick M, Swarm M, Hilbert M, O'Brien M, Harris KM, Varner C, LeBlanc C. **First Trimester Point of Care Ultrasound: Emergency Physician Image Review Processes and Case Variables Associated with Diagnostic Accuracy.** Objectives: The main objective of this research was to examine if physician image review processes were associated with increased diagnostic accuracy in the interpretation of first trimester point of care ultrasound (FT-POCUS) images. We also sought to determine which imaging features were associated with a challenging FT-POCUS case. Methods: This was a planned secondary analysis of a multicenter prospective cross-sectional study in a convenience sample of emergency physicians in the United States and Canada. The web-based intervention included FT-POCUS cases acquired via the transabdominal (TA; n=200 cases) or transvaginal (TV; n=200 cases) approach. Physicians were tasked to review a brief clinical stem, available views to identify pregnancy-related imaging findings. We extracted data on participant diagnostic correctness, diagnostic certainty, time on case, time in between cases, and proportion of views available per case reviewed. Results: We enrolled 317 participants and derived 16,295 case interpretations. Participant "definite" versus "probable" certainty was significantly associated with a higher odds of getting the diagnosis of intrauterine pregnancy (IUP) present or absent correct (OR=4.48; 95% CI 4.00, 5.01) and a lower odds of time spent reviewing cases. Participant who reviewed a higher proportion of available views per case had a higher odds of correctly identifying a fetal heartbeat (OR=1.51; 95% 1.34, 1.69), multiple IUPs (OR=1.33; 95% CI 1.10, 1.61), and adnexal structure (OR=1.11; 95% CI 1.04, 1.17), but a lower odds of correctly identifying an IUP (OR=0.93; 95% CI 0.88, 0.99). Eccentric IUP locations (p<0.001 for all comparisons) and endometrial collection/heterogenous uterine material (p<0.001 for all comparisons) were among the most difficult pregnancy-related imaging features to identify relative to other imaging findings. Conclusions: In a cohort of emergency physicians who interpreted FT-POCUS images on an on-line platform, participant confidence was associated with a higher competency and efficiency. Reviewing all views per case was associated with increased accuracy on some imaging findings but not others. These data also provide evidence for enhanced teaching opportunities on the most diagnostically challenging imaging findings.

Chandra K, Makhdom R, Dolan K, Thavanathan R, McDougall P, Atkinson P, Lewis D. **Asynchronous simulation-based training of resuscitative transesophageal echocardiography in emergency physicians.** Background: Emergency physicians are increasingly using transesophageal echocardiography (TEE) in the emergency department (ED). Simulation-based TEE training has been shown to be an effective learning tool to help teach TEE to physicians looking after critically ill patients in the ED. It is unclear if brief asynchronous learning and simulation-based TEE training are also effective for emergency physicians already experienced in point-of-care ultrasound (PoCUS). Our study aims to determine the effectiveness of this type of training. Methods: We conducted a prospective study on emergency physicians with baseline PoCUS experience at a single ED. Those who agreed to participate viewed a 30-minute module on TEE in the ED and reviewed a four-core view resuscitative protocol, which included the mid-esophageal four-chamber (ME4C), mid-esophageal long-axis (MELAX), trans-gastric short-axis (TGSA), and bicaval (BC) views. The physicians completed a baseline assessment of TEE image generation using a simulator, followed by a brief guided practice of the four TEE views. Finally, a post-intervention assessment was conducted. All views were recorded. The primary outcome was the percentage of total successful views determined by two blinded reviewers using a scoring tool. Results: Twenty emergency physicians completed the study. The mean age was 39 years old, 30 % were female, the median clinical experience was 5.5 years, and all participants had PoCUS experience (60 % core, 30 % advanced and 10 % received training in residency). At baseline, 63 % (95 % CI 52-72 %) views were successful and following guided practice, it increased to 93 % (84-97 %; p value <0.001). Conclusion: A brief 30-minute module on TEE in the ED was reasonably effective at generating successful TEE views using a simulator, and increased with guided practice. Future studies will focus on how to maintain TEE in skills in physicians who regularly use PoCUS in the ED.

# ICEM 2025: CANADIAN POCUS ABSTRACTS (CONTINUED)

Chenkin J, Ali N, Simard R, Shelton D. **Effectiveness of a flipped classroom model for teaching emergency physicians how to recognize signs of massive pulmonary embolism using point-of-care ultrasound: A randomized controlled study.** Background: Massive pulmonary embolism (PE) is a significant cause of morbidity and mortality in the emergency department. Diagnosis of this life-threatening condition can be difficult as patients are often too unstable for advanced imaging. Point-of-care ultrasonography (POCUS) has been shown to be a valuable tool for identifying massive PE at the bedside, leading to earlier treatment. Despite its utility, many emergency physicians are unfamiliar with how to recognize this condition using POCUS. One potential solution to increasing comfort with this technique is the use of asynchronous online learning tools such as a flipped classroom. However, it is unknown whether an online learning strategy is as effective as traditional in-person teaching. Methods: We invited all emergency physicians and residents at a single academic center to participate in this study. All participants completed a baseline evaluation of their ability to identify massive PE using a database of ultrasound clips. They were then randomized to flipped classroom (FC) or traditional learning (TL) groups. The FC group completed a web-based training module, and the TL group attended an in-person seminar. Both groups then completed an assessment of their ability to recognize massive PE using an online test. The primary outcome of this study was the difference in final test scores between the groups. A sample size of 26 participants was needed to identify a 10% difference between groups. Continuous data were compared using students t-test and categorical data were compared using a chi-square test with significance set at p=0.05. Results: A total of 30 participants completed the study (15 in FC and 15 in TL group). Most (80%) reported low baseline confidence in identifying massive PE with POCUS. There were no significant differences in baseline scores between the groups (65.0% ±10.2% FC vs 64.7% ±10.9% TL, p=0.87). Both groups demonstrated significant improvement in scores on final testing (overall difference of 9.1% ± 10.1%, p<0.01). There were no differences in scores between the groups on final testing (75.3% ± 12.3% FC vs 72.3% ±10.8% TL, p=0.50). There was no significant difference in confidence level between groups (p=0.46).Conclusion: We found that a FC model demonstrated similar effectiveness to TL for teaching how to identify signs of massive PE using POCUS. The results of this study may assist future curriculum development to facilitate asynchronous learning of ultrasound skills.

Fitzpatrick R, Nallbani M, MacIntyre J, Watson ML, Butler M, Campbell SG. **Addition of point of care ultrasound to a paramedic difficult intravenous access team in the emergency department: The P-IVPOCUS study.** Background: Emergency care frequently involves the use of peripheral intravenous access (PIVA). Achieving successful PIVA can be challenging, particularly in patients with difficult intravenous access (DIVA) due to factors such as aging, peripheral vascular disease, obesity, IV drug use, and anatomical variations, and in our ED patients identified as having DIVA may be referred to a Paramedic PIVA team. Point-of-care ultrasound (POCUS) has emerged as a promising tool to enhance the success rates of PIVA. Our objectives were to evaluate the effectiveness of adding POCUS to achieve PIVA success in patients referred to the PIVA team. Methods: This prospective study was conducted at a tertiary care ED in Nova Scotia between October 2023 and October 2024. The study involved comparing a 3-month pre-intervention phase with 9 months post-intervention. Advanced or Critical Care Paramedics on the team attended a four-hour training session on POCUS for DIVA. Patients were considered eligible for referral if they had any of the following: known to have DIVA, had characteristics that predispose the patient to have DIVA (e.g., obesity), a score of 2 or higher on the Adult-Difficult Venous Catheterization Scale (ADVC), or two failed attempts at PIVA by a medical provider. Data collected included first-pass success (FPS) rates, overall success rates (OS), and time to successful cannulation (TTC). Outcomes are presented unadjusted with proportions and odds ratios. Adjusted analyses were performed using a linear mixed model with individual paramedics set as a random effect. Results: 125 patients were evaluated in phase 1 and 303 in phase 2. FPS rates were 80.0% and 81.5%, and OS rates were 97.7% and 92.0%, respectively. Unadjusted overall success was more than 3 times greater in the POCUS group (OR 3.66; CI: [1.23, 11.6]). When adjusting for age, CTAS, ADVC score and intra-paramedic variance, overall success during the post-intervention phase was more than 4 times greater in the POCUS group (OR 4.76; CI: [1.54, 14.3]). TTC was 8.27 and 11.9 minutes, respectively, although the difference was not statistically significant. Conclusion: We found that the addition of POCUS to a paramedic DIVA team significantly improved success rates in patients shown to be or predicted to be DIVA.

# ICEM 2025: CANADIAN POCUS ABSTRACTS (CONTINUED)

Girdler H, Beyene T, Anbassa T, Wytsma J, Zewdu T, Sahota IS. **Surveying point of care ultrasound usage in emergency medicine by Ethiopian emergency physicians: a national needs assessment.** Introduction: Point of care ultrasound (POCUS) is a well-established diagnostic and therapeutic tool for emergency providers that is important in resource-limited settings where access to formal diagnostic imaging is restricted. Previous research and guidelines have identified the need for locally relevant POCUS curriculum and delivery methods. As part of the ongoing collaboration between Addis Ababa University and the University of Toronto, it is essential to identify the perceived education and equipment needs, optimal methods of delivery, and success criteria for POCUS education to ensure the sustainability of a competent and engaged community of emergency medicine and critical medicine (ECCM) physicians in Ethiopia. Methods: A needs assessment survey was distributed electronically via email and Telegram messenger application to emergency physicians in Ethiopia who graduated from an Ethiopian ECCM program. In order to complete the survey, respondents needed to confirm that they were currently practicing in Ethiopia. Statistical analysis of the data was completed. Results: While EM residency programs within Ethiopia have graduated 204 physicians over the last ten years, the exact number currently practicing in Ethiopia is unknown as some have left the country. Preliminary survey results had 39 responses, with representation from more than five cities across Ethiopia. All respondents identified using POCUS in their clinical practice, with 80% (n=31) using it daily thereby demonstrating the importance of this skill. The most commonly identified applications included E-FAST (n=38), IVC (n=37), RUSH (n=33) and basic cardiac (n=28). Barriers to POCUS usage included technical issues like broken or missing probes (n=14) and ultrasound repairs taking months (n=19). Facilitators included a want for more supervised scanning (n=31) and didactic POCUS education (n=28), as well as a belief that an advanced POCUS rotation should be included in EM residency training (n=34). Conclusion: There is a clear alignment across multiple sites around the most used POCUS applications, as well as a keen interest in pursuing advanced POCUS training, that provides direction for future education planning. By understanding the POCUS education needs of practicing ECCM physicians, we aim to build on existing POCUS curricula and be able to advocate for identified equipment needs; thereby improving emergency department patient care.

Isaac N, Polischuk M, Yohathasan V. **Single shot intertransverse process plane block for a ninety-year-old male with multiple displaced rib fractures using the Yale-Li regional protocol in the emergency department. A case report.** Introduction: Multiple rib fractures are complex injuries requiring expert management to prevent complications. The novel intertransverse process plane (ITP) block has a better safety profile then a paravertebral block, but maybe more efficacious than an erector spinae plane block. The Yale-Li regional protocol uses long-acting local anesthetic in combination with four milligrams of dexamethasone (DEX) and forty milligrams of methylprednisolone acetate (MPA). While DEX on its own has been shown to prolong nerve block duration by six hours, this protocol appears to provide analgesia lasting days. This has been found in multiple retrospective studies including total hip, total knee, and breast surgeries. While there are very rare theoretical complications; the benefits of long-acting analgesia without opioid medications make this a potential intervention in the emergency department (ED). Case description: A ninety-year-old male presented after an environmental factor led to a fall. He remained vitally stable but was in pain over his side. Investigations revealed six displaced lateral rib fractures and the patient was offered admission. Unfortunately, the patient refused and left with a script for opioid medications. The next day he returned unable to take deep breaths and requested admission. His exam was again unremarkable besides pain over his side. Repeat investigations were also unremarkable besides the already known rib fractures. After informed consent, a single ITP block under ultrasound guidance was performed using the Yale-Li protocol at the level of T6 with forty millilitres of 0.25% bupivacaine. The patient had benefit within fifteen minutes and began taking deep breaths. Admission was offered to the patient who was now walking around and he again declined. Seven weeks later the patient was called to ensure no significant complications. Remarkably the patient had only needed acetaminophen but was otherwise asymptomatic. He maintained all his other activities of daily living. Discussion: The use of both DEX and MPA is common in the pain literature, but not frequently used in nerve blocks or in the ED for fragility fractures. The Yale-Li protocol may provide extended benefit and in the case of this ninety-year-old patient was the only intervention needed for multiple displaced rib fractures. Further research including randomized control trials should consider this protocol for efficacy and safety profile.

# ICEM 2025: CANADIAN POCUS ABSTRACTS (CONTINUED)

Kanisha Cruz-Kan K, Ismath M, Girdler H, Zewdu T, Beyene T, Anbassa T, Sahota IS. **How can EM POCUS tackle rheumatic heart disease in Ethiopia?** Background: Ultra-portable point-of-care ultrasound (POCUS) devices are transforming echocardiographic screening by providing a portable, cost-effective, and user-friendly solution, particularly suited for low-resource settings. Rheumatic heart disease (RHD), a prevalent cardiovascular condition in children and young adults in low- and middle-income countries, is a significant cause of morbidity and mortality in Ethiopia. Given that early detection and management are essential, handheld ultrasound devices offer an accessible approach to echocardiographic screening for RHD in areas where conventional equipment and specialist expertise are often lacking. Methods: We present 3 cases of advanced RHD in young patients who presented to the Tikur Anbessa Specialized Hospital in Addis Ababa, Ethiopia in May-June 2024. All bedside echocardiograms were performed by emergency physicians using handheld portable ultrasound devices. Results:Case 1: 25-year-old female with a history of chronic RHD presenting with acute dyspnea. POCUS confirmed classic advanced RHD features. Case 2: 32-year-old female, post-mitral valve replacement, presented with symptoms suggestive of infective endocarditis. POCUS identified bioprosthetic lesions and associated mitral regurgitation associated. Case 3: 28-year-old male with chronic RHD presented with suspected infective endocarditis. POCUS revealed aortic valve vegetation, confirmed later by transthoracic echocardiography. Conclusion: Through these cases we discuss three key themes that provide opportunity to leverage POCUS as a tool for global health equity: 1) advancements in low cost, ultra-portable POCUS technology, 2) improvements in communications infrastructure, and 3) collaborative EM educational partnerships, using our experiences with TAAAC-EM as an example. We discuss how providing advanced POCUS training for Ethiopian EM residents, using the World Heart Federation non-expert screening criteria for RHD, could allow for improved screening of RHD across Ethiopia.

Karmen L, Chenkin J, Brade S, Simard R. **Identifying barriers to using point-of-care ultrasound to perform pulse checks in cardiopulmonary resuscitation among multidisciplinary healthcare providers.** Background: Rapid pulse detection is critical during cardiopulmonary resuscitation (CPR) to optimize patient outcomes. The point-of-care ultrasound (POCUS) pulse check is a novel technique using a high-frequency linear array probe to assess for a pulse in the carotid or femoral arteries. Healthcare providers (HCP) with minimal POCUS experience can be taught the POCUS pulse check with brief instruction. Despite its advantages, adoption remains low. This survey aims to investigate barriers faced by HCP in learning and implementing this technique in their clinical practice. Methods:We conducted a cross-sectional survey of HCP including physicians, nurses, paramedics, and dentists who attended an Advanced Cardiac Life Support (ACLS) course within the past six years. The survey explored barriers to implementing the POCUS pulse check. In November 2024 participants were invited via email to complete an electronic survey (Google Forms) which consisted of multiple-choice, 5-point Likert scale, and open-ended questions. Descriptive statistics were used to analyze quantitative data, while thematic analysis was applied to free-text responses. The chi-squared test was used to identify differences in perceived barriers between physician and non-physician respondents. Results:341 HCP completed the survey (response rate 8.6%), including physicians and trainees (58.7%), nurses (32.3%), nurse practitioners (3.2%), and paramedics (2.9%). 14% of participants had significant POCUS experience and 52.5% had attended a POCUS course. Despite half of participants reporting access to POCUS, only 5.2% utilize POCUS pulse check in every resuscitation. Participants strongly agreed or agreed that the lack of standard protocols for POCUS pulse check (77.1%), access to training and equipment (62.7%), and lack of opportunities to practice this skill (66.9%) were key barriers. Physicians found competing priorities during resuscitation to be a barrier while other HCP identified insufficient POCUS experience, and low confidence with POCUS as barriers to use ($p < 0.001$). Additional challenges identified included limited space for ultrasound equipment, the limited availability of POCUS outside the emergency department, and minimal financial resources for training. Conclusion: This survey highlights significant barriers to using the POCUS pulse check among HCP, including insufficient training, lack of standardized protocols, and limited availability of POCUS during resuscitations.

# ICEM 2025: CANADIAN POCUS ABSTRACTS (CONTINUED)

Katz-Dana H, Singer-Harel D, Thau E, Pathmaraj M, Simone L, Olszynski O, Pirie J, Harel-Sterling M. **Ultrasound in pediatric emergency medicine simulation: Evaluation of a longitudinal curriculum.** Background: Pediatric resuscitations involving shock and trauma are rare but high-stakes events in the Pediatric Emergency Department (ED). Effective use of point-of-care ultrasound (POCUS) can expedite diagnosis and treatment in such cases. This study aimed to assess the impact of a longitudinal Pediatric Emergency Medicine simulation curriculum and high-fidelity POCUS simulator on residents' clinical practice, comfort level, and motivation to learn resuscitative ultrasound. Methods: This mixed-methods study involved 12 Pediatric Emergency Medicine residents who participated in a 12-month simulation curriculum integrating resuscitative ultrasound. The POCUS simulator was integrated and made available for use during all simulations. Assessment and program evaluation occurred at multiple levels, according to Kirkpatrick's hierarchy, using both qualitative and quantitative methods. Residents were surveyed at baseline, 4, 8 and 12-months. Semi-structured interviews were conducted at the end of the 12-month study period. Results: Twelve residents participated in 23 simulation cases over the 12-month longitudinal curriculum. The POCUS simulator (Edus2J) was used by participants in 18/23 (78.2%) cases. Comparing pre- and post-curriculum changes, large effect sizes were seen in residents' comfort using ultrasound in resuscitation (including in cases of trauma and undifferentiated shock). Accordingly, the mean number of POCUS scans performed per resident clinically on shift increased from a mean (SD) of 5.7 (± 2.3) scans/month to 12.4 (± 5.1) scans/month. Qualitative analysis highlighted several themes, including the value of simulation for teaching the integration of resuscitative ultrasound in high-acuity low-occurrence events, and the effect of repeat exposures to resuscitative ultrasound. Conclusion: Our study demonstrated that a longitudinal, simulation-based curriculum focused on resuscitative ultrasound increased residents' confidence, their motivation and likelihood of using these skills in the clinical setting. Repeat simulation exposures to resuscitative ultrasound can help participants translate this critical skill into use at the bedside, especially in high-acuity low-occurrence events.

Murray N, Mitchell S, Kwok ESH, Woo M, Fagan L, Payne J. **Nursing ultrasound guided peripheral intravenous access: a quality improvement project.** Introduction: Failure to obtain peripheral IV (PIV) access leads to delayed treatment and the need for more invasive vascular access that have higher risks of complications. From a patient perspective, it leads to increased pain and poor ED experience. The goal of this quality improvement (QI) project was to decrease overall PIV insertion attempts in patients with difficult PIV access in our ED by implementing a nursing ultrasound-guided peripheral IV program (USGPIV). Methods: We conducted a pilot study for a larger QI initiative with successive iterative Plan-Do-Study-Act cycles. We developed a collaborative expert and provider informed USGPIV training program with our nurse educators. We recruited 7 nurses to complete data sheets on difficult PIV encounters both 3 months before and after the training program. Outcome measures were the number of attempts to establish PIV access, rates of invasive parenteral access, and time to establish PIV access. Process measures included the number of USGPIVs attempted since credentialing, and the frequency of US machines/equipment availability. Balancing measures were nursing satisfaction with the training course, rates of arterial puncture, and perceived time delays affecting other patients' care due to nursing time required to perform USGPIV. Results: The pilot study ran from Nov 2023 to April 2024, with data divided by pre- and post-program implementation. Pre-implementation, nurses reported 52 difficult PIV cases, compared to 42 post-implementation. Two patients required invasive access pre-implementation, versus one post-implementation. The average number of attempts to establish PIV access was 3.1 pre-implementation and 3.5 post-implementation. USGPIV was used in 42 cases post-implementation, with a success rate of 85.7%. The mean time to establish PIV was 17.9 minutes with the landmark technique and 6.4 minutes with USGPIV. Nurses reported time savings with USGPIV. Ultrasound availability was cited in 4 cases, and patient feedback showed improved satisfaction with USGPIV. No complications occurred, and overall program feedback was highly positive. Conclusion: Our study demonstrated that nursing USGPIV competency is feasible, timesaving, and improves patient satisfaction, supporting the expansion of the program in our department. This project can serve as a model for similar initiatives in other EDs across Canada, empowering nurses, expanding their scope of practice, and enhancing patient care & experience.

# ICEM 2025: CANADIAN POCUS ABSTRACTS (CONTINUED)

Naeem S, Aziz S, Hirst T, Strobel J, Mulvey J, Lang A, Patel J, Smith A, Cheng J, Palmer M, Schlautmann J, Christian M, Nevin D. **Implementation of prehospital point-of-care ultrasound using a novel continuous feedback approach in a UK helicopter emergency medical service.** Background: There has been increased use of prehospital point-of-care ultrasound (PoCUS) by helicopter emergency medical services (HEMS) in recent years. Lack of governance structure and evidence of benefit have been described as major barriers to its implementation. This paper describes a novel approach to implementation of prehospital PoCUS and clinical governance framework in a UK HEMS. Methods: A retrospective database review was undertaken at London's Air Ambulance (LAA) from 1st September 2021 to 31st March 2023. All patients who had PoCUS examination were included. Scans were archived in a cloud-based server and reviewed weekly by experts. They were graded in adequacy, agreement between reviewer and clinician was recorded and fed back to the clinicians allowing continuous feedback learning. In-hospital diagnosis was sought for patients having the full Pump, pleura and pouring blood (PPPB) protocol. Cohen's Kappa (ƙ) was calculated for inter-rater reliability. Sensitivity and specificity analysis was performed using 2x2 tables. Results: LAA attended 3,068 missions. Our reviewers identified 701 PoCUS scanning encounters and 628 were included in the final analysis. Clinicians performed 420 scans for pneumothorax, 308 for free fluid and 305 pericardial effusions respectively. Majority of the population were male (85%) who sustained traumatic (93.5%) thoracic injuries (65%). Paramedics performed 29% of the scans. The median on-scene time was 22.5 mins which was similar to those missions in which PoCUS was not performed. Reviewers deemed 83% of the scans of adequate quality. Inter-rater reliability between clinicians and reviewers was 0.6 for pericardial effusion, 0.67 for pneumothorax and 0.71 for free fluid respectively.

A full PPPB protocol was performed in 52 patients out of which 46 were included. The sensitivity and specificity of PPPB protocol for diagnosis life-threatening injuries was 0.5 and 0.9 respectively. Conclusion: Introduction of prehospital PoCUS in a HEM service utilizing high quality training, user-friendly workflow and image archiving system, robust governance framework and continuous feedback may be feasible. The bespoke PPPB protocol in prehospital can improve diagnosis of life-threatening injuries whilst not delaying treatment.

Park S, Bell C, Berthelsen L. **Sonographic assessment of fasting – emergency room sedations.** Background: Emergency medicine and anesthesia literature often disagree on the importance of fasting status for procedural sedation. Emergency medicine guidelines state there is insufficient evidence to delay sedation based on fasting status, relying on data from pediatric populations for support. The incidence of aspiration events during emergency department (ED) procedural sedation remains rare, but the discordance between guidelines and local protocols creates uncertainty and fasting status continues to influence the timing of less emergent sedations. POCUS has been used to assess gastric contents since the 1980s. In previous studies, most ED patients who met anasthesia fasting guidelines remained high-risk when assessed using POCUS, though many patients included in these studies were from pediatric populations. The correlation between fasting status and objective assessment with POCUS in adult ED patients remains unclear. We hypothesize that adult ED patients will have high-risk gastric contents even while meeting anesthesia fasting guidelines. Methods: Participants presenting to the Foothills Medical Centre ED who may have required ED sedation completed a questionnaire on fasting status based on sedation guidelines. POCUS images were obtained using the PERLAS method in supine and right lateral decubitus positions. Images were anonymized and stored offline for analysis. Images were classified as high risk (solid content) or lower risk (empty or liquid). Interrater reliability was calculated using Fleiss' Kappa Method. The chi-square test with Yates correction was used to assess the association between fasting status and gastric content. Ethics approval was provided by the University of Calgary: (REB24-0749). Results: 59 subjects were recruited. Interrater reliability with a kappa value of 0.93 was almost perfect. 44 patients did not meet fasting recommendations, of which 68.2% had high-risk gastric contents while 31.2% had low-risk content. 15 patients met fasting guidelines with low-risk content in 66.7% and 33.3%, respectively. No significant association was observed between fasting status and gastric contents assessed by POCUS ($\chi^2(1, N = 59) = 0.0447$, $p = 0.8325$). Conclusion: Our data suggests excellent interrater reliability in interpreting POCUS images of gastric contents and no significant association between fasting status and POCUS assessment of gastric contents in adults.

# ICEM 2025: CANADIAN POCUS ABSTRACTS (CONTINUED)

Razzaq S, Farber E, Nguyen O, Denault A. **Consensus recommendations for integrating point of care ultrasound technology in undergraduate medical education from the 2024 Seguin Canadian Ultrasound Education Conference.** Introduction: There is limited consensus on the use of simulators, phantoms, and technology for point-of-care ultrasound (POCUS) in Canadian undergraduate medical education (UGME). To address this, the 2024 Seguin Canadian POCUS Education Conference (SCPEC) invited representatives from medical schools across Canada to identify needs, barriers, and solutions on the use of such modalities for POCUS in UGME. Methods: The SCPEC is a medical-student-led, faculty-supported initiative, that recruited 8 student representatives from academic institutions across Western, Central, and Eastern Canada to help synthesize questions to prompt discussion during the conference. A modified consensus development panel was employed, dividing participants into groups containing a pre-clerkship and clerkship student, resident, and attending physician. During the conference, participants generated recommendations based on the prepared questions, which were anonymously voted on. Recommendations achieving an 80% consensus were included in the final results. Results:SCPEC hosted 14 of the 17 Canadian medical schools, with 75 participants from all training levels establishing recommendations on the needs, barriers, and solutions to adopting simulators, phantoms, and technologies for POCUS in UGME. Amongst them, 54% completed the questionnaires anonymously to identify recommendations meeting consensus. Key needs included early and longitudinal POCUS integration, identifying core objectives focusing on essential skills, and using simulators and phantoms for controlled, independent practice. Barriers identified were inconsistent equipment access, limited faculty training, lack of curriculum integration, reliance on simulators without real-patient practice, financial constraints, and insufficient institutional support for student initiatives. Solutions included cost-effective models, real-time feedback with peer-led training, funding and industry partnerships, curriculum integration, a national resource platform, and support for student-led POCUS interest groups. Conclusion:The 2024 SCPEC was a unique, student-driven initiative that united Canadian medical learners and educators to provide recommendations on the adoption of simulators, phantoms, and other technologies for POCUS in UGME. These recommendations may guide ultrasound technology integration at both national and institutional levels, informing educators, physicians, and trainees in UGME across Canada.

Razzaq S, Hamoudeh R, Turenne M, Chandra A, Martin ER, Turner T. **Gastric Point-of-Care Ultrasound Applications in the Emergency Department and Intensive Care Unit: A Scoping Review.** Background: Point-of-care ultrasound (POCUS) is a non-invasive, bedside imaging tool that aids in rapid diagnosis and management of pathologies in emergency departments (ED) and intensive care units (ICU). Gastric POCUS use has been well studied and summarized for preoperative risk assessment, anesthesia planning, and monitoring gastric emptying perioperatively. This scoping review synthesizes evidence on the applications of gastric POCUS in critically ill adult patients, highlighting its strengths and limitations to inform clinical practice and future research. Methods: This scoping review, based on the Arksey and O'Malley framework, involved a comprehensive search of PubMed, Scopus, and Cochrane Library using defined keywords and MeSH terms. Studies were included if they addressed gastric POCUS applications in adult populations within the ED and ICU. Eligible study designs include cohort, case-control, and population-based studies and secondary analyses of randomized controlled trials, excluding all reviews. Results: A total of 681 abstracts were screened, of which 79 articles were included in the review. Applications of gastric POCUS in the ED and ICU for adult patients included airway management and aspiration risk assessment, enteral nutrition monitoring and gastric volume assessment, ultrasound-guided tube placement, and diagnostic applications. Gastric POCUS demonstrated high sensitivity (100%) and specificity (92%) in assessing aspiration risk. POCUS reliably measured gastric residual volume (GRV) with 96.5% accuracy, reducing aspiration incidents and improving feeding protocols. Ultrasound-guided nasogastric tube placement achieved higher success rates (74% vs. 44% for blind insertion) and reduced radiation exposure compared to radiographic confirmation. Diagnostic applications of POCUS included gastrointestinal bleeding, gastric outlet obstruction, esophageal perforation, and foreign body identification. Conclusion: Gastric POCUS is a versatile tool with significant implications to optimize aspiration risk management, enteral feeding strategies, procedural guidance, and diagnostic capacity in the ED and ICU settings. Future research should focus on standardizing protocols and expanding operator training to maximize its clinical impact as well as studying impact of diagnostic uses of gastric POCUS on key performance indicators.

# ICEM 2025: CANADIAN POCUS ABSTRACTS (CONTINUED)

Shahar-Nissan K, Unnikrishnan B, Daniel RC, McLean L, Singh D. **Aeyeball: applying Machine Learning to Ocular Point of Care Ultrasound**. Background: Headache is a common presentation which can lead to diagnoses ranging from benign to a cause of elevated intracranial pressure (ICP). Traditional evaluation for elevated ICP requires fundoscopy for papilledema. This is challenging in pediatric patients, with low accuracy when performed by pediatricians. While CT and MRI are often downstream tests, both often require sedation in children. Ocular point-of-care-ultrasound (POCUS) is an accurate bedside tool to assess optic disc elevation, an ultrasound representation of papilledema, in children. It has been previously shown to correlate with increased ICP, proving to be noninferior to fundoscopy. Integrating POCUS with AI could improve the accuracy and consistency of elevated disc detection via automation. Objective: The aim is to develop a machine learning model to analyze ocular POCUS images to detect optic disc elevation. This will allow clinicians to make accurate, timely decisions regarding risk stratification for children with suspected elevated ICP. Design/Methods: A labeled dataset of ocular POCUS scans was created using an annotation pipeline using five experienced POCUS clinicians. For positive cases, POCUS frames were marked where raised optic disc elevation was present. There were 484,452 normal images (1196 patients) and 31,447 images with signs of raised ICP (81 patients). A ResNet-18 deep neural network binary classification model was trained (70% train, 10% validation, 20% held out test set). Training was done using AdamW optimization and evaluated on multiple metrics that included area-under-the-receiver-operator curve (AUROC) and area-under-the-precision-recall curve (AUPRC). Results: Outcome metrics on the held-out test set are: AUROC 0.98, AUPRC 0.97, positive predictive value 0.99, true positive rate 0.88, true negative rate 0.99. Keypoint detection of optic disc elevation show accurate image labelling. Conclusion:Our ML-powered POCUS based tool will transform detection of pediatric ICP evaluation by offering a reliable, scalable alternative to traditional fundoscopy. This approach could particularly benefit remote and underserved communities. Future work aims to integrate this tool into a hand-held POCUS hardware device.

Tasuku Takadera T, Aerin D, Holmes S, Akkad PJ, Maya Harel-Sterling. **From Clay to Clinical Practice: Developing POCUS-Compatible Task Trainers.** Background: Point-of-care ultrasound (POCUS) has become a critical skill for pediatric emergency physicians. While applications such as the Extended Focused Assessment with Sonography for Trauma (E-FAST) and basic cardiac function assessment are readily practiced in clinical settings, musculoskeletal (MSK) and procedural POCUS applications, including hematoma blocks and fracture identification or reduction, are less accessible due to limited training opportunities. Commercially available task trainers are expensive and often inaccessible, necessitating the development of low-cost, widely reproducible POCUS-compatible task trainers. Methods: We developed POCUS task trainers for skull and forearm fracture identification, hematoma block, and nerve block procedures. We aimed to identify ideal materials for these trainers that are affordable and globally accessible. Prototypes were created using various materials: sculpture clay, paper, candle wax, and polymer clay for simulating bone; yarn for nerves; and agar, gelatin, and psyllium husk (Metamucil) as soft tissue mediums. We also incorporated 3D-printed basic fracture models to improve replicability and accessibility, considering the increasing availability of 3D printers. Ultrasound images obtained using these models were compared to real bone images for fidelity. Results: We successfully created functional POCUS task trainers for fracture identification, hematoma block, and nerve block. Ultrasound images of the prototype models demonstrated high compatibility with real bone and tissue structures, offering realistic imaging for training purposes. Each material contributed unique benefits: sculpture clay and polymer clay closely resembled bone density, while agar, gelatin, and psyllium husk provided optimal soft tissue simulation. Yarn effectively represented nerve pathways, offering clear ultrasound visualization during simulated procedures. Incorporating 3D-printed models enhanced the ease of replication and precision of fracture anatomy. Initial evaluations by pediatric emergency POCUS faculty highlighted the practicality of these trainers, emphasizing their affordability and usability for training purpose in diverse settings. Conclusion: These task trainers, made entirely with low-cost, commercially available materials, facilitate replication in diverse settings. Future work will evaluate their educational effectiveness and expand procedural models for POCUS training.

# ICEM 2025: CANADIAN POCUS ABSTRACTS (CONTINUED)

Tasuku Takadera T, Bularan CR, Kanathasan SJ, Lee H. **Assessing Outcomes of Point of Care Ultrasound Use in Testicular Torsion in a Pediatric Emergency Department.** Background:Testicular torsion is a surgical emergency caused by twisting of the spermatic cord, obstructing blood flow to the testis. Literature highlights a critical 6-hour window for detorsion to salvage the testicle. Delays can lead to testicular necrosis and orchiectomy. Early diagnosis in the pediatric emergency department is crucial. Point-of-care ultrasound (POCUS) enables bedside identification of testicular torsion, potentially expediting care. However, its impact on clinical outcomes remains under-evaluated. Objective: This study retrospectively analyzes cases of testicular torsion to evaluate whether POCUS expedites care compared to radiology department ultrasound (RADUS). We examined its effect on emergency department (ED) workflow, consultation timing, and surgical intervention. Methods:A retrospective review included patients with confirmed intraoperative testicular torsion from January 2021 to October 2024. Excluded were cases transferred with a working diagnosis of torsion. Data points included age, symptom duration, laterality, and time intervals from provider initial assessment (PIA) to POCUS, RADUS, consultation, and surgery. Patients were categorized into three cohorts: (1) RADUS only, (2) POCUS followed by RADUS, and (3) POCUS only. Statistical analyses, including Mann-Whitney U tests, were performed for pairwise comparisons between groups. Results:We identified 68 eligible patients, with a median age of 13 years. Most presented within 6 hours of symptom onset with left testicular pain. Median intervals for PIA to consultation were 24 minutes (POCUS only), 38 minutes (POCUS-RADUS), and 95 minutes (RADUS only), while PIA to operating room (OR) times were 97 minutes, 120 minutes, and 185 minutes, respectively. Significant reductions were noted in PIA-to-consultation and PIA-to-OR times for POCUS-only vs. RADUS-only groups ($p < 0.001$). The POCUS-RADUS group showed reduced consultation time compared to RADUS-only ($p = 0.006$), but no significant change in PIA-to-OR time. ConclusionOur findings suggest that POCUS significantly reduces time to urological consultation and has the potential to expedite surgical intervention if POCUS can reliably replace RADUS. These results underscore the value of integrating POCUS into ED workflows for testicular torsion. Further studies with larger sample sizes are needed to strengthen these findings and validate the role of POCUS in improving clinical outcomes for testicular torsion.

Yohathasan V, Polischuk M, Isaac N. **Pecto-intercostal fascia plane nerve blocks and point of care ultrasound to diagnose and treat costal cartilage fractures after cardiopulmonary resuscitation in the emergency department. A case report.** Background: Blunt trauma chest pain after cardiopulmonary resuscitation (CPR) is complex as patients have tentative hemodynamics, yet often the severe chest wall pain is a driving force for worsening tachydysrhythmias. Point of care ultrasound is frequently used for diagnosing cardiac pathologies, but can also be used to look for pain sources in the anterior chest wall. The pecto-intercostal fascia plane (PIF) block has been used to offset surgical sternotomy pain from cardiac surgery and is increasingly used in trauma with good safety and high efficacy. Lastly, dexamethasone as an adjuvant has been shown to improve the duration of regional nerve blocks. All these techniques and interventions are familiar to the emergency and critical care physician and can be performed with ease.Case Description: This case report highlights a 50-year-old male who presented to the emergency department post return of circulation for a ventricular fibrillation arrest after CPR and defibrillation with severe ten out of ten anterior chest pain. He had a large body habitus, was mildly tachycardic and tachypneic, but otherwise had normal vitals and examination. Point of care ultrasound was used to identify bilateral costal cartilage fractures, and ultrasound guided PIF nerve blocks were performed. These blocks were located bilateral parasternal at T3/T7 and included 10ml of 0.25% bupivacaine with 2.5mg perineural/intramuscular dexamethasone for a total of 40cc of 0.25% bupivacaine and 10mg of dexamethasone. There were no complications, and the patients pain score decreased to a two on ten after fifteen minutes. This pain relief lasted for thirty hours until it returned at a similar intensity to his initial presentation. The patient provided consent to their information being shared in this case report. Discussion: Nerve blocks in acute trauma are increasingly being utilized in the emergency department due to the safety and efficacy of these interventions over other analgesics. Utilizing POCUS to diagnose painful conditions while also using ultrasound to guide interventions is a key skill for anyone who deals with post-traumatic or post-cardiac arrest patients. In this case, the PIF block in combination with POCUS diagnosed costal cartilage fractures and relieved pain for thirty hours. This was particularly beneficial for this patient as their chest wall pain left untreated may have triggered a repeated cardiac arrest from ventricular dysrhythmias.

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