



THE UNIVERSITY OF BRITISH COLUMBIA

Department of Medicine  
Faculty of Medicine

A light blue background featuring medical supplies: a petri dish with red agar and black spots in the top left, a white surgical mask in the center, a 5 ml syringe with red liquid in the center, and several red and white pills in the bottom right.

# 38<sup>th</sup> ANNUAL RESIDENT RESEARCH DAY

UBC Robson Square  
800 Robson St | Vancouver, BC

Wednesday, May 18, 2022  
9:30am - 5:00pm

Welcome to  
**UBC**

Department of Medicine



THE UNIVERSITY OF BRITISH COLUMBIA  
Robson Square

**38th Annual**

in

**Resident Research Day**

# Schedule

9:30a Opening Remarks - Dr. Anita Palepu

9:40a - 11:59a Podium Presentations - Sessions 1-2

12:00p Lunch

1:00p - 4:47p Podium Presentations - Sessions 3-5

1:00p - 4:54p Poster Presentations - Sessions 1-3

4:50p Closing Remarks

## Introduction

We are very pleased to welcome you here today to the 38th Annual Resident Research Day, an important celebration of the scholarly endeavors of the Residents and Fellows in our program. Today we take time to recognize the many hours of hard work, dedication and effort necessary to execute these scholarly research projects, and acknowledge the efforts of the faculty mentors who have contributed to the success of these projects.

The Department of Medicine is the largest department in the Faculty of Medicine, with over 1200 faculty members and staff across the province of BC. Our members represent 18 distinct divisions which focus on understanding the nature, cause, and prevention of adult disease. The mission of the Department is to provide the highest possible standards of excellence in patient care, teaching, and research. As residents trained in the Department of Medicine, you all play an integral part in helping deliver this mission by directly contributing to the high standards of patient care and research for which UBC Department of Medicine is recognized. Each year your hard work contributes to the over 1000 peer reviewed publications and abstracts. Your dedication to the creation, dissemination and translation of new knowledge is part of evolving health care landscape.

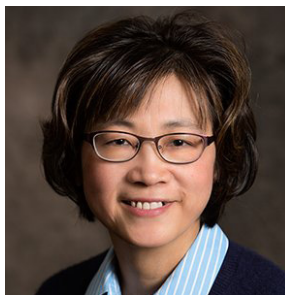
Today we encourage you to reflect on the lessons you have learned throughout your research projects and carry these forward as you develop your own practice. We hope that you will continue to develop and utilize evidence to inform your decision making, and contribute to the strong history of patient care through innovation.



Anita Palepu, MD, MPH, FRCPC, MACP  
Professor and Eric W. Hamber Chair  
Head, Department of Medicine  
UBC Department of Medicine



Andrea Townson, MD, FRCPC, MSCHPEd  
Medical Co-Chair, Regional Rehab Program, VCHA  
Clinical Professor, Division of Physical Medicine  
and Rehabilitation  
Associate Head Education  
UBC Department of Medicine



Teresa S.M. Tsang, MD, FRCPC, FACC, FASE  
Director of Echo Lab, VGH and UBC  
Professor, Division of Cardiology  
Associate Head Research  
UBC Department of Medicine

# Podium Presentation Moderator & Adjudicators



## Moderator & Adjudicator

Dr. Graham Wong  
MD MPH FRCPC FACC FCCS FAHA

Currently Dr. Wong is the Director of the UBC Cardiology Training Program, the Associate Director of the Cardiac Intensive Care Unit at Vancouver General Hospital, the Medical Director of the Vancouver Coastal Health Authority STEMI Program and the Medical Lead for the Coronary Artery Disease Population Group for Cardiac Services BC. He is a Clinical Professor of Medicine at UBC.

He was on the Primary Author Panel for the 2013 and 2018 Canadian Cardiovascular Society Antiplatelet Guidelines and was on the Primary Author panel for the 2021 CCS/Canadian Neurocritical Care Society Position Statement on Neuroprognostication for the Post Arrest Patient.



He was the Co-Chair of the 2017 Canadian Cardiovascular Society Position Statement on the Optimal Care of the Post Arrest patient and the Co-Chair of the 2019 Canadian Cardiovascular Society Guidelines on the Acute Management of STEMI.

He has authored or co-authored over 60 peer reviewed publications.

He has 2 boys playing rep hockey each with multiple games and practices, and he tries to cycle as much as he can so he can fit his current set of pants. As a result of all this he tires easily.



## Adjudicator

Dr. Yvette Drew MD, FRCPC, PhD  
Consultant Medical Oncologist, BC Cancer Vancouver  
Associate Professor, Dept Medicine, University of British Columbia

Dr. Yvette Drew is a Consultant Medical Oncologist at BC Cancer Centre Vancouver and Associate Professor at the University of British Columbia, she moved to Canada in May 2021.

She specializes in the systemic management of gynaecological cancers and early phase clinical trial delivery. She is part of the OVCARE team in Vancouver. Previously Dr Drew worked as a Senior Lecturer and Consultant in Medical Oncology at the Northern Centre for Cancer Care (NCCC) and the Clinical and Translational Research Institute, Newcastle University where she was gynae medical oncology research lead, deputy lead for the Newcastle Experimental Cancer Medicines Centre and undertook basic laboratory gynae focused research within the gynae-onc translational team.



Dr. Drew undertook specialist medical oncology training at the Beatson West of Scotland Cancer Centre, Glasgow and the NCCC. During this time she was awarded a CRUK-funded PhD fellowship investigating the role of PARP inhibitors in Homologous Recombination deficient ovarian cancer. During her PhD she won a Merit award for her research from the American Society of Clinical Oncology (ASCO) and was awarded the Medical Sciences Doctoral Prize (Newcastle university, 2013). She has played a key role in both the pre-clinical and clinical development of the PARP inhibitor rucaparib in ovarian cancer. In the UK she has also led on trials as national CI from first-in-human phase 1 to later phase 3 clinical trials. Research interests include the targeting DNA repair pathways as treatment for gynaecological cancers and PARP inhibitor resistance.

# Poster Presentation Adjudicators



## Adjudicator

Dr. Amiri attended internal medicine and rheumatology training at the University of British Columbia. She undertook additional training in management of rheumatic diseases in pregnancy at the Organization of Teratology Information Specialists (OTIS), University of California, San Diego and University of Toronto. She is the director of PReDICT clinic (Pregnancy and Rheumatic Disease Clinic) at St. Paul's Hospital. Her other areas of interest include medical education. She is a staff rheumatologist at VGH, SPH, and LGH, and also practices in North Vancouver.



## Adjudicator

Dr. Karen Tran is a Clinical Assistant Professor in the Division of General Internal Medicine at University of British Columbia. She is a General Internist on the Clinical Teaching Unit at VGH and BC Women's Hospital and, co-Director of the Hypertension Clinic at VGH. She is a Scientist at CHEOS and VCHRI and recently awarded the VCHRI Mentored Clinician Scientist Award. Her research interests are hypertension, digital health technologies, women's health and Post COVID.



## Podium Presentations

### Session 1

- 9:40a ***Reperfusion Delays and Outcomes among ST-Segment–Elevation Myocardial Infarction Patients with and without Cardiogenic Shock***  
Andrew Kochan, Card PGY5  
Sponsor: Chris Fordyce
- 9:53a ***A Novel Continuous Left Ventricular Diastolic Function Score Using Machine Learning***  
River Jiang, Card PGY4  
Sponsor: Teresa Tsang
- 10:06a ***Variability in NOAC dose eligibility and adjustment according to renal formulae and clinical outcomes in AF patients with and without CKD: Insights from ORBIT AF II***  
Robert Yao, IM PGY3  
Sponsor: Chris Fordyce
- 10:19a ***Deep Learning Model for Accurate Measurement of Left Ventricular Dimensions***  
Jeffrey Yim, IM PGY3  
Sponsor: Teresa Tsang
- 10:32a ***Association of Frailty and Residential Location with In-Hospital and Long-Term Outcomes among ST-Elevation Myocardial Infarction Patients receiving Primary Percutaneous Coronary Intervention***  
Farshad Hosseini, IM PGY2  
Sponsor: Chris Fordyce
- 10:45p Break

**Session 2**

- 10:55a ***Echocardiographic Predictors of Transthyretin Cardiac Amyloidosis***  
Jeffrey Yim, IM PGY3  
Sponsor: Darwin Yeung
- 11:08a ***Magnetic Resonance Imaging in the Evaluation of Patients with Frequent Premature Ventricular Complexes***  
Farshad Hosseini, IM PGY2  
Sponsor: Marc Deyell
- 11:21a ***Deep Learning Model for Accurate Diagnosis of Atrial Fibrillation on Echocardiography***  
Nelson Lu, IM PGY2  
Sponsor: Teresa Tsang
- 11:34a ***Emergency medical system (EMS) cardiopulmonary resuscitation (CPR)-to-return of spontaneous circulation (ROSC) interval and predictors on long-term survival and functional outcomes after out-of-hospital cardiac arrest (OHCA)***  
Jocelyn Chai, IM PGY2  
Sponsor: Chris Fordyce
- 11:47a ***Speckle Tracking RV Global Longitudinal Strain for Prediction of Pulmonary Hypertension***  
Shanjot Brar, IM PGY1  
Sponsor: Teresa Tsang

12:10p Lunch

## Session 3

- 1:00p ***Respiratory Pathogens Other Than Haemophilus in Small Airways Are Associated with Neutrophilic Inflammation and Poor Health Status in COPD***  
Nawaf Alotaibi, IM PGY3  
Sponsor: Don Sin
- 1:13p ***Ewing sarcoma and rhabdomyosarcoma patient outcome variations based on treatment centre volume***  
Sarah Yeo, IM PGY1  
Sponsor: Ying Wang
- 1:26p ***Post-COVID Dyspnea: Prevalence, predictors and outcomes in the UBC respiratory clinic cohort***  
Japnam Grewal, IM PGY2  
Sponsor: Chris Ryerson
- 1:39p ***Comparison of ZZ- and SZ-Genotype Patients in a Canadian Alpha-1 Antitrypsin Deficiency Population: Rate of FEV<sub>1</sub> Decline and other Clinical Characteristics***  
Samuel (Reuben) Gurupatham, IM PGY2  
Sponsor: Kenneth Chapman
- 1:52p ***Tuberculosis and Risk of Cancer: A systematic review and meta-analysis***  
Pauline Luczynski & Phil Poulin, IM PGY2  
Sponsor: James Johnston
- 2:05p Break



**Session 4**

- 2:15p ***Biallelic loss of TP53, PTEN, and RB1 associates with aggressive clinical features and poor outcomes in metastatic castration resistant prostate cancer (mCRPC)***  
Corinne Maurice-Dror, GU Med Onc Fellow  
Sponsor: Kim Chi
- 2:28p ***Frontline Therapy with Bendamustine Rituximab (BR) and Rituximab Cyclophosphamide Vincristine Prednisone (RCVP) Confer Similar Long-term Outcomes in Patients with Treatment-naïve Waldenstrom's Macroglobulinemia in a Real-world Setting: A population-based analysis***  
Laura Kim, IM PGY2  
Sponsor: Ciara Freeman
- 2:41p ***Prevalence and Correlates of Anxiety and Depression in Caregivers to Assisted Living Residents During COVID-19: A cross-sectional study***  
Natasha Lane, IM PGY2  
Sponsor: Colleen Maxwell
- 2:54p ***Health and Social Outcomes for Homeless Persons Attending a Transitional Care Centre Following Hospital Discharge***  
Alec Yu, IM PGY1  
Sponsor: Anita Palepu
- 3:07p ***Public awareness of alcohol-related health effects and the current adequacy of public health education: liver transplant recipients speak out. A survey study of liver transplant patients***  
Shirley Jiang, IM PGY2 & Katerina Schwab (Presenter), MSI  
Sponsor: Eric Yoshida
- 3:20p ***Resident-led collaborative case-based rounds from the University of Rwanda (UR) and University of British Columbia (UBC) Global Health Partnership: lessons learned from a new virtual collaboration***  
Wayne Leung, IM PGY2  
Sponsor: Marla McKnight
- 3:33p Break

## Session 5

- 3:43p ***The Impact of Antibiotic Choice and Duration on Outcomes of Pyogenic Liver Abscess (PLA) in the Calgary Health Zone (CHZ): A Population-Based Study***  
Jennifer Losie, ID PGY5  
Sponsor: Michael Parkins
- 3:56p ***In renal transplant recipients, do peri-operative urine cultures for ureteric stent removal support targeted antimicrobial prophylaxis?***  
Marie Kim, ID PGY4  
Sponsor: Victor Leung
- 4:09p ***Glucagon-like peptide-1 (GLP-1) receptor agonists in patients with obesity and rheumatoid or psoriatic arthritis: a scoping review***  
Derin Karacabeyli, IM PGY3  
Sponsor: Diane Lacaille
- 4:22p ***Perspectives in the use of "Failure to Thrive" in hospitalized older adults: a qualitative study***  
Clara Tsui, Geri PGY5 & Robynn Lester, Geri PGY5  
Sponsor: Martha Spencer
- 4:35p ***Pharmacological Management of Agitation and Delirium in Older Adults: A survey of practices in Canadian emergency departments***  
Natanya Russek, IM PGY2  
Sponsor: Martha Spencer
- 4:50p Closing Remarks

## Poster Presentations

### Session 1

- 1:00p ***Characteristics and Outcomes of Type 2 Diabetes Following Bariatric Surgery in British Columbia: A Retrospective, Population-Based Analysis***  
Davis Sam, Adult Endo PGY5  
Sponsor: Jordanna Kapeluto
- 1:12p ***A QI Project: Awareness of and Access to Phone Interpretation Services on CTU***  
Soma Dalai, IM PGY2  
Sponsor: Matt Michaleski
- 1:24p ***Outcome of elderly patients with classic Hodgkin lymphoma in British Columbia***  
Phoebe Cheng, Med Onc PGY4  
Sponsor: Kerry Savage
- 1:36p ***Ultrasonographic Evaluation of Muscle Quality after Anterior Interosseous to Ulnar Nerve Transfer for Chronic Cubital Tunnel Syndrome***  
Lee Bauer, PM&R PGY3  
Sponsor: Mike Berger
- 1:48p ***Venous Thromboembolism in Chinese Patients: A role for ethnic profiling?***  
Julia Varghese, Heme PGY5  
Sponsor: Paul Yenson
- 2:00p Break

Session 2

2:22p ***Clinical outcomes in fresh versus cryopreserved hematopoietic stem cell products in BC: A retrospective study***

Angela Wan, IM PGY1

Sponsor: Kevin Hay & Claudie Roy

2:46p ***When do trainees achieve competency in performing endoscopic submucosal dissection: A systematic review***

Rojin Kaviani, IM PGY2

Sponsor: Neal Shahidi

3:10p ***A Scoping Review of the Validity Evidence for Entrustment Rating Scales***

Abhilasha Patel, IM PGY3

Sponsor: Rose Hatala

3:22p Break

## Session 3

- 3:32p ***The Association Between Median Income and Severity of Pulmonary Hypertension at Diagnosis and Risk at Follow Up in a Public Health Care System***  
Hessah AlQuraishi, IM PGY2  
Sponsor: Nathan Brunner
- 3:44p ***Natural History of Untreated Idiopathic Frequent Premature Ventricular Complexes***  
Jacky Tang, IM PGY1  
Sponsor: Marc Deyell
- 3:56p ***Evaluating The Utility and Safety of a Rapid Access Chest Pain Clinic at a Quaternary Referral Centre***  
Siavash Ghadiri, IM PGY2  
Sponsor: Krishnan Ramanathan
- 4:06p ***Palpitations in Pediatric Patients Post-Ablation for Tachyarrhythmias***  
Chris Li, IM PGY1  
Sponsor: Shubhayan Sanatani
- 4:18p ***New-Onset Immune-Mediated Disease Following SARS-CoV-2 Vaccination: A Case Series***  
Sarah Hansen, Rheum PGY5  
Sponsor: Jennifer Reynolds & Natasha Dehghan
- 4:30p ***Survey on Herpes Zoster (HZ) vaccination in patients with inflammatory bowel disease (IBD)***  
Shirley Jiang, IM PGY2 & Daud Akhtar (Presenter), GI PGY4  
Sponsor: Brian Bressler
- 4:50p Closing Remarks

# PODIUM PRESENTATIONS

## REPERFUSION DELAYS AND OUTCOMES AMONG ST-SEGMENT–ELEVATION MYOCARDIAL INFARCTION PATIENTS WITH AND WITHOUT CARDIOGENIC SHOCK

Andrew Kochan<sup>1</sup>, Terry Lee<sup>2</sup>, Nima Moghaddam<sup>1</sup>, Grace Milley<sup>3</sup>, Joel Singer, PhD<sup>2</sup>, John A. Cairns<sup>1</sup>, Graham C. Wong<sup>1</sup>, Christopher B. Fordyce<sup>1</sup>

1 - Division of Cardiology, Department of Medicine, University of British Columbia, Vancouver, B.C.

2 - Centre for Health Evaluation and Outcome Sciences, Providence Health Care Research Institute, University of British Columbia, Vancouver, B.C.

3 - Center for Cardiovascular Innovation, University of British Columbia, Vancouver, B.C.

### Background

Mortality remains high among STEMI patients with cardiogenic shock (CS), and rapid reperfusion has been shown to improve outcomes. However, the relative impact between reperfusion delays and outcomes among STEMI patients with and without CS is unclear.

### Objective

To determine the relative impact first medical contact (FMC)-to-device times have on mortality among STEMI patients with and without CS and to determine an optimal FMC-to-device time for shock and non-CS STEMI patients.

### Methods

We performed a retrospective analysis of the VHCA STEMI registry including all patients with STEMI who received PCI between January 1, 2010, and December 31, 2020. Patients were stratified based the presence of CS at the time of admission and assessed for the primary outcome of in-hospital mortality and the secondary outcome of an in-hospital major adverse cardiovascular event (MACE). Logistic regression with restricted cubic splines was used to estimate the relationships between FMC-to-device time and the primary and secondary outcomes in the CS and non-CS groups.

### Results

2929 consecutive STEMI patients were included, 9.4% (n= 275) had CS. Compared to non-CS patients, those with CS had higher incidences of mortality (41.1% vs. 1.9%,  $p < 0.001$ ) and MACE (81.1% vs. 19.4%,  $p < 0.001$ ). Median FMC-to-device time was 113.5 (IQR 93.0-145.0) minutes for CS patients and 103.0 (IQR 85.0 – 130.0) minutes for non-CS patients. CS patients were more likely to have FMC-to-device times above guideline recommendations (76.6% vs. 54.1%,  $p < 0.001$ ) than non-CS patients. Between 60 and 90 minutes, for each 10-minute increase in FMC-to-device time, mortality for CS patients increased by 5-8%, while for non-CS patients it increased by less than 0.5%.

### Conclusion

Among STEMI patients undergoing primary PCI, reperfusion delays among CS patients are associated with significantly worse outcomes compared to non-CS patients. Strategies to reduce FMC-to-device times for STEMI patients with CS are needed.

# A NOVEL CONTINUOUS LEFT VENTRICULAR DIASTOLIC FUNCTION SCORE USING MACHINE LEARNING

River Jiang

## Background

Unlike LV ejection fraction (EF), which provides a precise, reliable, and prognostically valuable measure of systolic function, there is currently no analogous single measure of diastolic function.

## Objectives

This study aimed to develop an automated continuous score to grade left ventricular (LV) diastolic function using machine learning modeling of echocardiographic data.

## Methods

We screened consecutive echo studies performed at a tertiary care centre between February 1, 2010 and March 31, 2016. We excluded studies containing features that would interfere with diastolic function assessment as well as studies in which one or more parameters within the contemporary diastolic function assessment algorithm were not reported. For the remaining studies, we graded diastolic function based on the 2016 American Society of Echocardiography (ASE) / European Association of Cardiovascular Imaging (EACVI) Guidelines and divided them into a training set (80%) and a validation set (20%), excluding indeterminate studies. We trained several machine learning approaches (SVM [support vector machine], DT [decision tree], XGB [XGBoost], and DNN [dense neural network]), blinded to the ASE/EACVI algorithm, to classify studies within the training set by diastolic dysfunction severity. The DNN model was retrained with transfer learning to generate a regression model (R-DNN) to output a continuous diastolic function score.

## Results

A total of 28,986 studies were included in our study. The models were able to reclassify studies with high agreement to the grading based on the ASE/EACVI algorithm (SVM 83%, DT 100%, XGB 100%, DNN 98%). The continuous diastolic function score generated by the R-DNN model corresponded well with the diastolic function grading based on the ASE/EACVI guidelines, with mean scores of  $1.00 \pm 0.01$  for studies with normal function; and  $0.74 \pm 0.05$ ,  $0.51 \pm 0.06$ , and  $0.27 \pm 0.11$  for mild, moderate, and severe diastolic dysfunction respectively. A score of  $<0.91$  predicted abnormal diastolic function with an area under the receiver operator curve (AUROC) of 0.99 while a score of  $<0.65$  predicted elevated filling pressure with an AUROC of 0.99.

## Conclusions

To our knowledge, this is the first study to use machine learning to assimilate echocardiographic data and generate an automated continuous diastolic function score that corresponds well with current diastolic function grading recommendations.



## VARIABILITY IN NOAC DOSE ELIGIBILITY AND ADJUSTMENT ACCORDING TO RENAL FORMULAE AND CLINICAL OUTCOMES IN ATRIAL FIBRILLATION PATIENTS WITH AND WITHOUT CKD: INSIGHTS FROM ORBIT AF II

Ren Jie Robert Yao, DaJuanicia Holmes, Jason G. Andrade, Adeera Levin, Jonathan P. Piccini, Christopher B. Fordyce

### Background

NOACs are used for prevention of thromboembolism in AF patients and require dose adjustment based on kidney function. The most common estimates of kidney function employed in clinical practice are derived from eGFR, but eCrCl is recommended by product monographs.

### Objective

We sought to evaluate misclassification of NOAC renal dosing using eGFR versus eCrCl.

### Methods

We included patients enrolled in ORBIT-AF II trial. eGFR was calculated using both MDRD and CKD-EPI formulae. Dose adjustments and eligibility were based on landmark trials. Dosing was considered inappropriate when use of eGFR resulted in a lower (under-treatment) or higher (over-treatment) dose than that recommended by eCrCl. The primary outcome of major adverse cardiovascular and neurological events (MACNE) was a composite of cardiovascular death, stroke or systemic embolism, and myocardial infarction. Sensitivity analysis was performed for the subgroup of patients with CKD.

### Results

Among 8,727 in the overall cohort, agreement between CrCl and eGFR was observed in 93.5-93.8% of patients. Among 2,184 patients with CKD, the agreement between eCrCl and eGFR was 79.9-80.7%. Dosing misclassification was observed in 11.5% of rivaroxaban, and 1.1% of dabigatran and apixaban treated patients. Patients receiving an inappropriate NOAC dose had a lower mean eCrCl and eGFR. Undertreated patients were older and of lower body weight compared to overtreated and appropriately dosed patients. Dosing misclassification was more frequent in the CKD population (41.9% of rivaroxaban, 5.7% of dabigatran and 4.6% apixaban patients). At one-year, undertreated patients in the CKD group had significantly greater MACNE [adjusted HR 2.90 (1.09-7.75) compared to appropriate NOAC dosing group  $p = 0.03$ ].

### Conclusions

The prevalence of NOAC dosing misclassification NOACs was high when using eGFR, particularly among those with CKD. Among patients with CKD, potential undertreatment due to inappropriate and off-label renal formulae may result in worse clinical outcomes. These findings highlight the importance of using eCrCl, and not eGFR, for dose-adjustment in all AF patients receiving NOACs.

## DEEP LEARNING MODEL FOR ACCURATE MEASUREMENT OF LEFT VENTRICULAR DIMENSIONS

Authors: Jeffrey Yim<sup>1</sup>, Mobina Mahdavi<sup>2</sup>, Hooman Vasefi<sup>2</sup>, Christina Luong<sup>3</sup>, Michael Y.C. Tsang<sup>3</sup>, Darwin F. Yeung<sup>3</sup>, Ken Gin<sup>3</sup>, Parvathy Nair<sup>3</sup>, John Jue<sup>3</sup>, Purang Abolmaesumi<sup>2</sup>, Teresa S.M. Tsang<sup>3</sup>

### Affiliations

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b. Department of Electrical and Computer Engineering, University of British Columbia, Vancouver, British Columbia, Canada.

c. Division of Cardiology, University of British Columbia, Vancouver, British Columbia, Canada.

### Background

Left ventricular (LV) geometric patterns aid clinicians in the diagnosis and prognostication of various cardiomyopathies. Two-dimensional transthoracic echocardiogram is the clinical standard for the assessment of LV dimensions. Assessment of LV dimensions and wall thickness is known to be associated with significant interobserver and intraobserver variability. Automation of echocardiographic interpretation using machine learning may allow non-experts to assess LV dimensions while improving reliability. The aim of the study was to use machine learning methodologies to derive an accurate automated assessment of LV dimensions.

### Methods

A total of 29,946 transthoracic echocardiographic cines from the PLAX view over a 5-year period were used to train, validate, and test a deep neural network model to automatically assess left ventricular internal dimension at end diastole (LVIDD), interventricular septum at end diastole (IVS), posterior wall thickness at end diastole (PWT), and LV mass. The model was trained to select end-diastolic frames with the largest LVIDD and to identify four landmarks, marking the dimensions of LVIDD, IVS, and PWT using manually labeled landmarks as reference. LV mass was calculated using the Cube formula. The model was validated from 3,014 echocardiographic cines to calibrate the uncertainty prediction. The accuracy of the model was evaluated from a test set of 3,053 echocardiographic cines, and the mean relative error and R<sup>2</sup> scores were calculated.

### Results

The deep neural network model accurately measured LVID, IVS, PWT, and LV mass compared to study report values with a mean relative error of 5.48%, 11.64%, 12.69%, and 13.75% respectively. The R<sup>2</sup> of the model for the LVID, IVS, PWT, and the LV mass was 0.77, 0.42, 0.26, and 0.77 respectively. A total of 240 echocardiographic cines (8% of the test population) were rejected due to high uncertainty or low quality of predictions.

### Conclusion

In this pilot study, we developed a unique machine learning model for automating the measurement of LV dimensions and wall thickness on two-dimensional transthoracic echocardiogram. Further studies are being conducted for validation in a large and diverse populations.

## ASSOCIATION OF FRAILITY AND RESIDENTIAL LOCATION WITH IN-HOSPITAL AND LONG-TERM OUTCOMES AMONG ST-ELEVATION MYOCARDIAL INFARCTION PATIENTS RECEIVING PRIMARY PERCUTANEOUS CORONARY INTERVENTION

Farshad Hosseini MD, Ian Pitcher MD, Mehima Kang BSc, Martha Mackay PhD RN, Joel Singer PhD, Terry Lee PhD, Kenneth Madden MD MSc, Graham C. Wong MD MPH, Christopher B. Fordyce MD MHS MSc

### Background

Frailty is generally a marker of worse prognosis, but its prevalence and use as a risk marker is not routinely incorporated in clinical practice. Similarly, the cardiovascular outcomes in patients from a long-term care facility (LTCF) compared to those from home remains unknown.

### Objective

To evaluate the impact of frailty on in-hospital and post-discharge 1-year outcomes in STEMI patients aged 65 or older and to identify if LTCF residence prior to the index event is a predictor of adverse outcomes in this population.

### Methods

A retrospective chart review was conducted on 1,579 STEMI patients  $\geq 65$  years in the Vancouver Coastal Health region who underwent primary PCI (pPCI) between 2007 and 2020. Those who had undergone fibrinolytic therapy or had an out-of-hospital cardiac arrest were excluded. A frailty index (FI) was determined using the health deficit accumulation model with frail patients being defined as those with a FI  $> 0.25$ . Patient's place of residence (LTCF or not) was documented at the time of admission. The primary outcome was 1-year all-cause mortality. The secondary outcomes were 1-year cardiac mortality, in-hospital all-cause mortality, and the composite of adverse in-hospital outcomes including all-cause mortality, cardiogenic shock, heart failure, re-infarction, major bleeding, or stroke.

### Results

There were 228 (14.4%) frail patients with 100 (6.3%) originating from LTCF. After multivariable adjustment, worsening frailty was associated with increased 1-year all-cause mortality (odds ratio [OR], 1.48; 95% CI, 1.10-2.00,  $P=0.011$ ), in-hospital all-cause mortality (OR, 1.88; 95% confidence interval [CI], 1.50-2.35,  $P<0.001$ ) and the composite adverse outcome (OR, 1.46; 95% CI, 1.27-1.68,  $P<0.001$ ). Baseline LTCF residence was not associated with 1-year all-cause mortality (OR, 1.43; 95% CI, 0.62-3.27;  $P=0.402$ ), but was associated with increased cardiac mortality at 1-year (OR, 4.22; 95% CI, 1.57-11.32,  $P=0.004$ ).

### Conclusion

Among STEMI patients receiving pPCI, frailty was common and independently associated with increased in-hospital and long-term adverse outcomes. LTCF residence on admission was associated with increased long-term cardiac mortality. These findings raise the need for early recognition of frailty and implementation of a comprehensive approach towards the management of frail patients. It also suggests that LTCF residence on admission should not be used as a marker of frailty.

## ECHOCARDIOGRAPHIC PREDICTORS OF TRANSTHYRETIN CARDIAC AMYLOIDOSIS

Jeffrey Yim<sup>1</sup>, Dary Chen<sup>2</sup>, Margot Davis<sup>3</sup>, Daniel Worsley<sup>4</sup>, John Jue<sup>3</sup>, Teresa S.M. Tsang<sup>3</sup>, Christina Luong<sup>3</sup>, Michael Y.C. Tsang<sup>3</sup>, Ken Gin<sup>3</sup>, Parvathy Nair<sup>3</sup>, Darwin F. Yeung<sup>3</sup>.

### Affiliations

1. Department of Medicine, University of British Columbia, Vancouver, BC, Canada
2. Faculty of Medicine, University of British Columbia, Vancouver, BC, Canada
3. Division of Cardiology, University of British Columbia, Vancouver, BC, Canada
4. Department of Radiology, University of British Columbia, Vancouver, BC, Canada.

### Background

Transthyretin cardiac amyloidosis (TTR-CA) is an under-recognized cause of heart failure, which is a leading cause of hospitalization in Canada. Recent advances in nuclear imaging with the use of pyrophosphate (PYP) scans now permit making the diagnosis of TTR-CA non-invasively, which greatly improved identification of TTR-CA. Transthoracic echocardiogram (TTE) is often the primary initial imaging modality in evaluation, and the apical-sparing pattern on strain imaging has been implicated in predicting TTR-CA diagnosis. The aim of our study is to assess the clinical and echocardiographic characteristics predictive of TTR-CA diagnosis, and to assess the accuracy of apical-sparing pattern on strain imaging in the diagnosis of TTR-CA.

### Methods

We performed a retrospective cohort study of all patients with suspected TTR-CA who underwent PYP scans and a TTE at two tertiary care centres in Vancouver, Canada from 2017 to 2021. Electronic medical records were reviewed for baseline clinical characteristics and echocardiographic characteristics were extracted from the TTE reports.

### Results

We identified 503 patients with suspected CA who underwent PYP scans and a TTE. A total of 81 patients resulted in a diagnosis of TTR-CA. Patients with TTR-CA were older, more likely to be male, have higher NYHA classes, had higher likelihood of atrial fibrillation, and less likely to have diabetes or history of coronary artery disease. Echocardiographic features predictive of TTR-CA diagnosis were larger left ventricular mass, septal wall thickness, posterior wall thickness, and right atrial volume. Patients with TTR-CA were more likely to have lower TAPSE, RV  $S'$ , and average  $E/e'$ . Left ventricular ejection fraction were not different between patients with and without TTR-CA.

### Conclusion

We identified several clinical and echocardiographic features suggestive of TTR-CA among patients with suspected TTR-CA. Further evaluation with strain analysis is ongoing to assess the reliability of apical sparing pattern in the diagnosis of TTR-CA.

## MAGNETIC RESONANCE IMAGING IN THE EVALUATION OF PATIENTS WITH FREQUENT PREMATURE VENTRICULAR COMPLEXES

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### Background

The role of cardiac magnetic resonance imaging (cMRI) in the evaluation and management of patients with frequent premature ventricular complexes (PVCs) of unknown etiology remains unclear.

### Objective

This study evaluated the prevalence and prognostic significance of myocardial abnormalities detected with cMRI among patients with frequent PVCs and no known structural heart disease.

### Methods

This prospective cohort study included consecutive patients with frequent PVCs and negative initial diagnostic workup who underwent cMRI with late gadolinium enhancement (LGE) imaging. The clinical outcome was a composite of mortality, ventricular fibrillation, sustained ventricular tachycardia, or reduction in LVEF  $\geq 10\%$ .

### Results

255 patients were included, of which 35 (13.7%) had evidence of myocardial abnormality on cMRI. Age  $\geq 60$  (odds ratio [OR], 6.96; 95% CI 1.30 to 37.18), multifocal PVCs (OR, 10.90; 95% CI, 3.21 to 36.97), and non-outflow tract left ventricular PVC origin (OR, 3.00; 95% CI, 1.00 to 8.95) were independently associated with the presence of a myocardial abnormality on cMRI. After a median follow-up of 36 months, the composite outcome occurred in 15 (5.9%) patients. The presence of a myocardial abnormality on cMRI was independently associated with the composite outcome (hazard ratio [HR], 4.35; 95% CI, 1.34 to 14.14;  $p=0.014$ ).

### Conclusion

One in 7 patients with frequent PVCs with no known structural heart disease had myocardial abnormality detected on cMRI, and these abnormalities were associated with adverse clinical outcomes. These findings highlight the important role of cMRI in the evaluation of patients with frequent PVCs.

## DEEP LEARNING MODEL FOR ACCURATE DIAGNOSIS OF ATRIAL FIBRILLATION ON ECHOCARDIOGRAPHY

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### Background

Automated rhythm detection on echocardiography through artificial intelligence (AI) has yet to be fully realized. This can be of clinical relevance as rhythm strips are unavailable on point-of-care ultrasound (POCUS), which may be used in settings where electrocardiograms (ECG) are inaccessible. We propose an AI model trained to identify atrial fibrillation (AF) using apical 4-chamber (AP4) cines without needing ECG data.

### Methods

Transthoracic echocardiography studies of consecutive patients  $\geq 18$  years old from 2009 to 2019 at our tertiary care centre were retrospectively reviewed for AF and sinus rhythm, which were the dominant rhythms ( $>95\%$ ). Analysis of other rhythms was excluded. AP4 cines with 3 cardiac cycles, interpreted by level III echocardiographers as the gold standard based on imaging assessment and the rhythm strip, were also verified with a 12-lead ECG done within 30 days to form datasets of agreeing or conflicting rhythm labels between the modalities. Two confirmatory ECGs were used when available for paroxysmal AF. Datasets of 100% agreeing rhythm labels were introduced to the open-source video assessment deep learning model ResNet(2+1)D, modified for 2-class classification, with 80-10-10 train-validation-test split ratio.

### Results

634 patient studies (1205 cines) with agreeing rhythm label datasets were included. After training with 504 studies (973 cines), the AI model achieved high accuracy on validation for detection of both AF and sinus rhythm (F1-score = 93.3% vs 90.9%). Performance was consistent on the test dataset for AF and sinus rhythm (F1-score = 94.4% vs 93.1%). The AI model was further evaluated on a subset of same-day echocardiogram studies and ECGs with agreeing or conflicting rhythm labels ( $n=40$ ). Using the echocardiographer's assessment as the gold standard, this resulted in F1-scores of 93.9% and 90.3% for AF and sinus rhythm respectively (mean F1-score = 92.1%).

### Conclusion

AF detection by AI on echocardiography without ECG appears accurate when compared to an echocardiographer's assessment as the gold standard. This has major clinical implications in POCUS for potential detection of early disease or paroxysmal AF missed on conventional ECG, and adds to the armamentarium for stroke risk stratification and timely consideration of anticoagulation.

## EMERGENCY MEDICAL SYSTEM (EMS) CARDIOPULMONARY RESUSCITATION (CPR)-TO-RETURN OF SPONTANEOUS CIRCULATION (ROSC) INTERVAL AND PREDICTORS ON LONG-TERM SURVIVAL AND FUNCTIONAL OUTCOMES AFTER OUT-OF-HOSPITAL CARDIAC ARREST (OHCA)

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### Introduction

Previous data has shown longer EMS CPR-to-ROSC interval (per minute) is linearly associated with worse hospital-discharge outcomes in out-of-hospital cardiac arrest (OHCA); however, it is unclear whether this association extends post-discharge. Further, it is unclear if the pre-arrest patient phenotype influences the duration of resuscitation required to achieve ROSC.

### Purpose

We sought to determine the association of EMS CPR-to-ROSC interval with survival outcomes at hospital discharge, 1- and 3-years post-hospital discharge. We described functional outcomes at discharge and at 1-year post-discharge. We also explored pre-OHCA factors associated with longer EMS CPR-to-ROSC intervals.

### Methods

We utilized the British Columbia Cardiac Arrest Registry linked to provincial administrative databases. We included emergency medical services (EMS)-treated adult OHCA from January 2009 to December 2016. Patient pre-OHCA characteristics including demographics, co-morbidities, and medications were compared by  $\leq 10$ , 10-20, and  $>20$  minute EMS CPR-to-ROSC interval categories. Outcomes included survival and functional outcomes at hospital discharge and 1-year post-discharge, as well as 3-year post-discharge survival. We examined the relationship between EMS CPR-to-ROSC interval categories and 1- and 3-year survival using the Kaplan-Meier (KM) method. Using regression models, we examined the relationship between the EMS CPR-to-ROSC interval (continuous variable) with all outcomes.

### Results

Among 10,241 OHCA, 4604 (45%) achieved ROSC, with a median EMS CPR-to-ROSC interval of 15.5 (IQR 9.0- 22.9) minutes. Patient history of diabetes, chronic kidney disease (CKD), and prior MI were associated with longer EMS CPR-to-ROSC intervals. Overall, 1245 (12.2%) survived to hospital discharge. Estimated KM survival rates at 1- and 3- years were 92% [95% CI 90-93%] and 84% [95% CI 82-86%] respectively, with non-statistically significant separation of curves stratified by EMS CPR-to-ROSC intervals (Figure 1). Longer EMS CPR-to-ROSC interval was non-linearly associated with lower survival and functional outcomes at hospital discharge, however, this interval was not associated with any post-discharge outcomes.

### Conclusion

This study demonstrated that longer EMS CPR-to-ROSC interval was associated with lower survival at hospital discharge, but not associated with survival at 1- and 3- years. Similarly, longer EMS CPR-to-ROSC interval was associated with poor functional outcomes at hospital discharge, but not at 1-year post-discharge. In patients achieving ROSC, diabetes, chronic kidney disease (CKD), and prior MI were associated with longer EMS CPR-to-ROSC intervals.

## SPECKLE TRACKING RV GLOBAL LONGITUDINAL STRAIN FOR PREDICTION OF PULMONARY HYPERTENSION

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### Background

Right ventricular (RV) systolic dysfunction in patients with pulmonary hypertension is associated with worsening outcomes. Novel methods such as speckle tracking echocardiography (STE) can provide an assessment of strain and quantitate global and regional myocardial function. The objective of our study was to assess the relationships between commonly used methods of RV function and STE strain, and to further evaluate if strain can be used to risk stratify pulmonary hypertension.

### Methods

We included consecutive patients who had an echocardiogram performed with primary indication being "pulmonary hypertension" at Vancouver General Hospital between January 2021 and April 2021. Echocardiographic characteristics of the patients in the cohort were extracted from the hospital echo image archiving system, Syngo Dynamics [Siemens Medical Solutions, Ann Arbor, MI]. The extracted data included RV function by visual assessment, TAPSE, tissue Doppler RV  $S'$ , fractional area change (FAC), and pulmonary artery systolic pressure (PASP). Visual assessment was reported as either normal or abnormal (mild, moderate, severely reduced RV systolic function). Speckle tracking global RV strain was analyzed in this study by single operator (SB), using TomTec, as a novel assessment of RV function. Correlations between strain and different RV parameters were assessed. Comparison of strain to other RV parameters for prediction of severity of pulmonary hypertension was made.

### Results

A total of 91 patients were included in our study (78 with nonmissing PASP). There was significant Spearman rank correlation between strain and the following parameters:  $RVA_4C$  ( $r=-0.54$ ,  $p<.0001$ ), TAPSE ( $r=0.56$ ,  $p<.0001$ ),  $S'$  ( $r=0.36$ ,  $p=.0007$ ), FAC ( $r=0.84$ ,  $p<.0001$ ), and PASP ( $r=0.63$ ,  $p<.0001$ ). In linear regression models, strain predicts TAPSE [B=0.24, 95% C.I. (0.15, 0.32),  $p<.0001$ ],  $RVA_4C$  [B=-0.45, 95% C.I. (-0.60, -0.29),  $p<.0001$ ], and PASP [B=-1.44, 95% C.I. (-1.90, -0.98),  $p<.0001$ ]. Logistic regression models predicting PASP  $\geq 35$ mmHg,  $\geq 50$ mmHg, and  $\geq 70$ mmHg using strain were statistically significant ([OR= 0.88, 95% C.I. (0.83, 0.94),  $p=0.0003$ ]; [OR= 0.79, 95% C.I. (0.69, 0.89),  $p=0.0002$ ]; and [OR=0.75, 95% C.I. (0.62, 0.90),  $p=0.0022$ ]), respectively. FAC alone and strain alone predicts at least moderate (50mmHg+) pulmonary hypertension very well (ROC AUC: FAC 0.898; Strain 0.864; FAC+ Strain 0.900). The use of both FAC and strain provides the best predictive ability, even though this did not reach statistical significance.

### Conclusions

Speckle tracking strain assessment of RV global function can discriminate severity of pulmonary hypertension. It correlates well with other RV function parameters and enhances FAC in the prediction of at least moderate pulmonary hypertension.



## RESPIRATORY PATHOGENS OTHER THAN HAEMOPHILUS IN SMALL AIRWAYS ARE ASSOCIATED WITH NEUTROPHILIC INFLAMMATION AND POOR HEALTH STATUS IN COPD

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### Rationale

It is generally believed that inflammation in the small airways is a key mechanism for chronic obstructive pulmonary disease (COPD) progression and exacerbations. However, it is not known whether the presence of microorganisms in bronchoalveolar lavage (BAL) is associated with airway inflammation in patients with stable COPD.

### Methods

In this study, we have performed flexible bronchoscopy and collected BAL samples from 38 subjects with stable COPD who participated in the DISARM (Differential effects of Inhaled Symbicort and Advair on Lung Microbiota) Study (NCT02833480). All subjects were free of exacerbations for at least 8-weeks and free of any inhaled corticosteroids for at least 4-weeks before bronchoscopy. Total cell count from BAL samples was measured using hemocytometer, and cell differentials were measured via cyto centrifugation. Then samples were tested on the Randox cystic fibrosis respiratory pathogen panel, which interrogates 21-bacteria, 7-viruses, and 4-fungi that are common potentially-pathogenic organisms in the airways. Then we have evaluated the results relationship with airway inflammation and health status (St George's Respiratory Questionnaire SGRQ).

### Results

The subjects had a mean age of  $64 \pm 8$  years, mean forced expiratory volume in one second (FEV<sub>1</sub>) of  $57 \pm 16$  percent of predicted, and a mean total SGRQ score of  $43.2 \pm 15.8$  units; 44.7% were current smokers, and 89.4% were men. Molecular pathogen testing demonstrated that 18 subjects (47.4%) had pathogens detected in their BAL; while the rest had a negative result. Subjects with pathogens detected had significantly higher BAL-neutrophil% (pathogen-positive group, median 20% [5.6-45.2%] vs. pathogen-negative group, 4% [2-16.2%];  $P=0.024$ ). Seven subjects out of the eighteen had a positive result for only Haemophilus influenzae (HI). These subjects had significantly lower BAL-neutrophil% compared to the others who were pathogen-positive (only-HI, 7.5% [4.5-19%] vs. pathogen-positive, 40% [8-62%];  $P=0.007$ ). As HI could be a colonizer (rather than a pathogen), we merged the pathogen-negative group ( $n=20$ ) with those who only tested positive for HI ( $n=7$ ). The pathogen-positive exclusive of HI group ( $n=11$ ) had significantly higher BAL-neutrophil% compared with pathogen-negative or only-HI group (pathogen-positive, 40% [8-62%] vs. pathogen-negative or only-HI, 5% [3-17%];  $P=0.013$ ). On multivariate regression controlling for age, sex, FEV<sub>1</sub>% of predicted and smoking status; pathogen-positivity exclusive of only-HI was independently associated with BAL neutrophil% ( $P=0.003$ ). Total SGRQ score was also higher (pathogen-positive,  $51.3 \pm 18$  vs. pathogen-negative or only-HI,  $39.7 \pm 13.7$ ;  $P=0.039$ ).

### Conclusions

This study illustrates that the presence of potentially-pathogenic microorganisms (other than HI) in stable COPD is associated with intense neutrophilic airway inflammation and poor health status. Anti-inflammatory and/or anti-microbial therapeutic targets in these patients may lead to better outcomes in the future.

## EWING SARCOMA AND RHABDOMYOSARCOMA PATIENT OUTCOME VARIATIONS BASED ON TREATMENT CENTRE VOLUME

Sarah Yeo

### Background

Due to the complexity of Ewing Sarcoma (EWS) and rhabdomyosarcoma (RMS), studies demonstrate improved patient outcomes when managed at high volume centres (HVCs) with multidisciplinary tumour board discussions (MTDs). However, frequent travel to HVCs is less feasible in larger geographical areas such as British Columbia (BC), Canada.

### Objective

To explore the difference in outcomes of EWS and RMS patients based on location of diagnosis and treatment in BC.

### Methods

This analysis includes a multi-center retrospective chart review of adults diagnosed with EWS and RMS between Jan 1st 2000, to Dec 31st 2020 undergoing curative intent therapy in one of six cancer centers contributing to the BC Cancer Sarcoma Outcomes Database. Fisher's exact and chi-squared tests were used to evaluate associations. Cox proportional hazards model was used to assess for predictors of better survival outcomes by treatment centre. HVCs was defined as those that saw  $\geq 15$  patients.

### Results

77 patients were included in this analysis. Compared to patients treated at low volume centres (LVCs), those treated at HVCs were more likely to receive curative intent radiation 34 (89%) vs 13 (59%), more likely to be presented at MTDs, 42 (91%) vs 23 (74%), and less likely to experience disease progression ( $p = 0.044$ ). There was no statistically significant difference in overall survival by treatment center. Variations in care exist for both treatment and outcomes amongst EWS and RMS patients treated at high vs low volume centers in BC. This may reflect differences in access to resources, clinical specialists, and potentially higher comfort levels with upfront aggressive treatment. This study can be used to better inform decisions regarding triaging and centralization of curable EWS and RMS patients.

## POST-COVID DYSPNEA: PREVALENCE, PREDICTORS AND OUTCOMES IN THE UBC RESPIRATORY CLINIC COHORT

Japnam Grewal

### Background

Previous literature has established that dyspnea is a common symptom following COVID-19 infection, but our understanding of the mechanisms of dyspnea remains limited. In particular, it is unclear whether persistent post-COVID dyspnea is contributed to by extrapulmonary and psychosocial factors.

### Objective

The aim of this study is to determine the prevalence, severity, and predictors of dyspnea at 12 months following COVID-19 infection, and to describe the respiratory, cardiac, and patient-reported outcomes in patients with persistent post-COVID dyspnea.

### Method

We enrolled a prospective cohort of patients from the VGH and SPH Post-COVID-19 Respiratory Clinic who had been admitted to hospital with COVID-19 between March and June 2020. Inclusion criteria included hospitalization for COVID-19, ability to complete study questionnaires in English, and provision of informed consent. Patients were initially assessed 3 months post-discharge, with subsequent follow-up occurring at the 6- and 12-month mark. Patients completed a standardised set of questionnaires and cardiopulmonary investigations at each visit.

### Results

Clinically meaningful dyspnea was present in 46% of patients at 12 months following COVID-19 infection. There was worse mood, sleep, quality of life, and frailty in patients with dyspnea when compared to patients without dyspnea. There was no statistically significant difference in pulmonary function testing (PFT) findings when comparing patients with and without dyspnea at 12 months post-COVID-19 infection. Of the 35 patients with dyspnea at 12 months, 22 (63%) had PFT abnormalities, 7 (20%) had abnormal troponin or BNP levels, and 13 (37%) had a mood abnormality, and 5 (14%) had none of these findings. Dyspnea and a mood abnormality at 3 months post-COVID-19 infection predicted dyspnea at 12 months post-COVID.

### Conclusion

Post-COVID dyspnea is a multifactorial entity, and mood appears to play a significant role. The persistent experience of dyspnea and associated morbidity creates the need for early identification of patients with dyspnea post-COVID infection, with early referral to both pulmonary and psychiatric resources.

## COMPARISON OF ZZ- AND SZ-GENOTYPE PATIENTS IN A CANADIAN ALPHA-1 ANTITRYPSIN DEFICIENCY POPULATION: RATE OF FEV<sub>1</sub> DECLINE AND OTHER CLINICAL CHARACTERISTICS

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### Background

The SZ genotype of alpha-1 antitrypsin deficiency (A<sub>1</sub>ATD) is associated with less severe deficiency of serum alpha-1 antitrypsin (A<sub>1</sub>AT) protein than the more common and severely deficient ZZ genotype. Few studies have compared the risk of pulmonary disease in these deficiency populations.

### Methods

We performed a retrospective cohort study comparing A<sub>1</sub>ATD patients with the ZZ genotype (n=221) and the SZ genotype (n=37). All data was extracted from the Alpha-1 Canadian Registry. The primary endpoint of the investigation was the rate of FEV<sub>1</sub> decline.

### Results

While both cohorts had deficient serum A<sub>1</sub>AT levels at the time of diagnosis (prior to augmentation therapy), ZZ patients had significantly lower serum levels than SZ patients (mean 0.26 g/L vs 0.65 g/L, p<0.05). Significantly more ZZ than SZ patients were symptomatic (cough, wheeze and/or breathlessness) at the time of diagnosis (94% versus 62%; p<0.05). The mean rate of FEV<sub>1</sub> decline was significantly greater in ZZ than SZ patients; 63.9 mL/year vs. 23.10 mL/year (p<0.05). There was no statistically significant difference in the rate of FEV<sub>1</sub> decline between the genotypes when stratifying by both smoking history and history of augmentation therapy. Within the ZZ cohort, 33.9% of patients had received augmentation therapy, 12.2% received oxygen therapy, 5.0% received a lung transplant and 0.9% of patients died. In the SZ cohort, one patient (2.7%) received both augmentation therapy and lung transplantation, zero patients were on chronic oxygen therapy and zero patients died.

### Conclusions

This study represents one of the largest longitudinal reviews of lung function in A<sub>1</sub>ATD patients with the ZZ and SZ genotypes. Canadian A<sub>1</sub>ATD patients with the ZZ genotype have significantly lower serum A<sub>1</sub>AT levels and faster rates of decline than their SZ counterparts. ZZ patients have a greater symptom burden at the time of diagnosis and receive more intensive therapy for the pulmonary manifestations of their disease.

## TUBERCULOSIS AND RISK OF CANCER: A SYSTEMATIC REVIEW AND META-ANALYSIS

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### Introduction

Cancer is a leading cause of death among people who experience tuberculosis disease (TB), but little is known about its timing and incidence following TB. Our primary objectives were to describe the pooled risk of all and site-specific cancers in people with TB compared to the general population or suitable controls. Our secondary objective was to estimate the pooled risk of malignancy at different time points following TB diagnosis.

### Methods

This study was prospectively registered in PROSPERO (CRD42021277819). We systematically searched MEDLINE, Embase, and the Cochrane databases for studies published between 1980 and 2021. We included original observational research articles estimating cancer risk among people with TB versus controls. Articles were excluded if they had a sample size of fewer than 50 individuals; used cross-sectional, case series, or case report designs; and had a follow-up period of less than one year. We used random-effects meta-analysis to obtain the pooled risk of cancer in the TB population.

### Results

We identified 5,160 unique studies and included data from 17 articles. The pooled standardized incidence ratios (SIR) of all cancer (1.62, 95% CI 1.35-1.93,  $I^2 = 97%$ ) and lung cancer (3.20, 95% CI 2.21-4.63,  $I^2 = 90%$ ) was increased in the TB population compared to controls. The pooled risk of all cancers and lung cancer was highest within the first year following diagnosis of TB (4.70, 95% CI 1.80-12.27,  $I^2 = 99%$ ) but remained elevated for over five years.

### Conclusions

There is an increased risk of both pulmonary and non-pulmonary cancers in people who experience TB. More research is needed to develop effective cancer screening and prevention strategies in patients treated for TB. Based on these findings, clinicians should have a high degree of suspicion for malignancy in the TB population, particularly within a year of TB diagnosis.

## BIALLELIC LOSS OF TP53, PTEN, AND RB1 ASSOCIATES WITH AGGRESSIVE CLINICAL FEATURES AND POOR OUTCOMES IN METASTATIC CASTRATION RESISTANT PROSTATE CANCER (MCRPC)

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### Background

Deleterious alterations in tumor suppressor genes (TSGs) TP53, RB1, and PTEN are potential markers of small cell neuroendocrine prostate cancer (SCNP), and androgen receptor pathway inhibitor (ARPI) resistance. We examined the outcomes and clinical features of mCRPC patients (pts) harboring biallelic loss in 0, 1, 2 or all 3 TSGs.

### Methods

We identified 210 consecutive mCRPC pts providing  $\geq 1$  plasma cell-free DNA sample with  $\geq 20\%$  circulating tumor DNA fraction (ctDNA%) during their mCRPC disease course. ctDNA%  $\geq 20\%$  enabled sensitive characterization of biallelic TSG loss (including by homozygous deletions and mutation plus somatic loss-of-heterozygosity; LOH). Patient records were reviewed for baseline characteristics, SCNP histology, and presence of liver metastases. We investigated associations between TSG loss and the following clinical outcomes: PSA response (PSA decline  $\geq 50\%$  (PSA50 RR)), progression free survival (PFS) on 1L therapy, and overall survival (OS) from 1L therapy.

### Results

Median follow-up was 16.5 months (range: 0.4-112.4) and OS event rate was 95%. Median age at 1L mCRPC was 71 years (range: 48-98). Most pts were ECOG PS 0-1 (79%) and 13% had liver metastases. 91% received ARPI for 1L mCRPC and 7% received ARPI for castration-sensitive disease. TP53 was primarily inactivated by somatic mutation plus LOH (90%), whereas RB1 (71%) and PTEN (86%) were more commonly inactivated by homozygous deletions. Compared to pts without evidence of biallelic TSG loss, pts with loss of 3 TSGs were significantly enriched for de-novo M1 disease (86 vs. 60%,  $p=0.05$ ) and liver metastases (28.5 vs. 6.8%,  $p<0.05$ ). Ten pts (4.7%) had histologically confirmed SCNP and provided ctDNA at time of SCNP diagnosis. Of these, 7 (70%) had biallelic loss of  $\geq 2$  TSGs. For all pts receiving 1L therapy, loss of  $\geq 1$  TSG(s) was associated with decreased OS (HR: 1.86, 95% CI: 1.40-2.48,  $p<0.01$ ) and PFS (HR:1.74, 95% CI 1.29-2.34,  $p<0.01$ ) compared to pts with no biallelic TSG loss. Furthermore, a cumulative increase in the number of TSGs lost was associated with an incremental reduction in OS and PFS (Table 1).

### Conclusions

In a cohort enriched for poor prognosis (i.e. high ctDNA%), cumulative loss of TSGs is associated with aggressive disease features and poor clinical outcomes. These patients may benefit from alternative treatment intensification strategies.

FRONTLINE THERAPY WITH BENDAMUSTINE RITUXIMAB (BR) AND RITUXIMAB CYCLOPHOSPHAMIDE VINCRISTINE PREDNISONE (RCVP) CONFER SIMILAR LONG-TERM OUTCOMES IN PATIENTS WITH TREATMENT-NAÏVE WALDENSTROM'S MACROGLOBULINEMIA IN A REAL-WORLD SETTING: A POPULATION-BASED ANALYSIS.

JL Kim, C Venner, AS Gerrie, KJ Savage, D Villa, DW Scott, JW Craig, P Farinha, B Skinnider, GW Slack, JM Connors, LH Sehn, CL Freeman

Waldenström macroglobulinemia (WM) is a rare, indolent B-cell lymphoma. After the STiL-1 trial demonstrated significant benefit using bendamustine and rituximab (BR) compared to R-CHOP in a subgroup analysis (n=41 WM patients), as well as reduced toxicity, BR became the preferred regimen for all patients with symptomatic treatment naïve (TN) WM in BC since 2014. Prior to the introduction of BR, the combination of rituximab, cyclophosphamide, vincristine, and prednisone (RCVP), was the standard of care in BC for this population since 2004. We report a population-based analysis evaluating outcomes in TN-WM patients treated with BR or RCVP.

The BC Cancer Centre for Lymphoid Cancer Database was used to identify 111 TN-WM patients treated with BR (n=57) or RCVP (n=54) as their first systemic therapy between August 1, 2004 - August 1, 2020. Event-free survival (EFS) was defined as time from start of therapy to progression, relapse, initiation of alternative therapy, histologic transformation, or death due to any cause. Overall survival (OS) was defined as time from start of therapy to death due to any cause. Median follow-up was 5.9 years (range 0.8-19.2). Four-year EFS was 57% (95%CI 40-71%) and 60% (95%CI 45-72%) for BR and RCVP, p=0.5. Four-year OS was 74% (95%CI 57-85%) and 81% (95%CI 67-89%) for BR and RCVP, p=0.6. Based on SPEP monoclonal band or serum IgM reduction post-treatment, patients treated with BR achieved an overall response rate (ORR) of 96.5%, (partial response 36.8%, very good partial response 24.6%, complete response 29.8%), and patients treated with RCVP achieved an ORR of 92.7% (partial response 42.6%, very good partial response 24.1%, complete response 16.7%). Our results demonstrate that excellent, durable outcomes can be achieved with both BR and RCVP, and the latter remains a reasonable option when cost is of concern.

## PREVALENCE AND CORRELATES OF ANXIETY AND DEPRESSION IN CAREGIVERS TO ASSISTED LIVING RESIDENTS DURING COVID-19: A CROSS-SECTIONAL STUDY

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### Background

Family and friend caregivers play significant roles in advocating for and ensuring quality health and social care of residents in Assisted Living (AL) homes. Little is known about how the COVID-19 pandemic and related visitor restrictions affected their health and mental well-being.

Objective: To examine the prevalence and correlates of anxiety and depressive symptoms among caregivers of AL residents during the initial wave of COVID-19 in two Canadian provinces.

### Methods

Cross-sectional web-based survey conducted among family/friend caregivers of AL residents in Alberta and British Columbia (Oct 28, 2020 - Mar 31, 2021) to collect data on their sociodemographic, health and caregiving characteristics, as well as concerns about residents' health and social care before and during the pandemic. Clinically significant anxiety disorder and depressive symptoms were assessed with the GAD-7 and CES-D10 instruments, respectively. Separate multivariable (modified) Poisson regression models identified caregiver correlates of each mental health condition.

### Results

Among the 673 caregivers completing the survey (81% for Alberta residents), most were women (77%), white (90%) and aged  $\geq 55$  years (81%). Clinically significant anxiety and depression were present in 28.6% and 38.8% of caregivers respectively. Both personal stressors (comorbidity level, income reduction, low social support) and caregiving stressors exacerbated by the pandemic were independently associated with caregiver anxiety and depression. The latter included increased concern about the care recipients' depression and reported intention to withdraw the resident from AL because of COVID-19.

### Conclusions

Caregivers of residents in AL homes reported significant personal and caregiving-related stressors during the initial wave of COVID-19 that were independently associated with an increased likelihood of experiencing clinically significant anxiety and depressive symptoms. Healthcare providers and AL staff should be aware of the prevalence and varied correlates of caregivers' mental health during public health crises so that appropriate screening and support may be identified and implemented.



## HEALTH AND SOCIAL OUTCOMES FOR HOMELESS PERSONS ATTENDING A TRANSITIONAL CARE CENTRE FOLLOWING HOSPITAL DISCHARGE

Alec Yu

### Background

People identifying as homeless in Metro Vancouver are becoming more medically complex, with a greater proportion of those aged 55+ (25%) and living with two or more medical comorbidities (60%) than ever before.[1] Previous studies done in Vancouver have demonstrated the efficacy of early access to supportive housing and social service navigation in helping these individuals secure stable housing long term.[2][3]

### Objective

We aimed to evaluate the medical and social outcomes of a novel Transitional Care Centre (TCC) based out of St. Paul's Hospital.

### Methods

The Transitional Care Centre (TCC) is a facility on the grounds of St. Paul's Hospital that provides housing, meals, and access to services including peer navigation to individuals facing homelessness upon hospital discharge. We conducted a mixed-methods prospective cohort study of clients at the TCC between June 2019 – June 2021. All participating clients consented to a semi-structured interview, demographic survey, and medical chart review during their stay at the TCC and again 12 months following discharge from the TCC. We then used statistical regression modelling and thematic analysis to describe these quantitative and qualitative data sets respectively.

### Results

55 TCC clients completed the baseline interview and demographic surveys; unfortunately, only 22 completed the 12-month follow-up interview due in part to limitations imposed by the COVID-19 pandemic. Clients of the TCC had fewer hospital admissions in the 12 months after discharge from the TCC in comparison to the 12 months prior (2.37 vs 0.53,  $p=0.02$ ), and a trend towards fewer emergency department visits that was not statistically significant (4.95 vs 3.26,  $p=0.13$ ). Many clients highlighted the important role of having immediate access to safe and convenient housing in maintaining health, connecting to services, and accessing long-term housing or addictions programming. Some clients voiced concerns about the food services, curfew, and access to personal hygiene products.

### Conclusion

Providing homeless persons with short-term transitional housing after hospital discharge improved their perceived ability to meet health and housing goals and was associated with fewer hospital readmissions.

[1] BC Non-Profit Housing Association (2020). 2020 Homeless Count in Metro Vancouver. Prepared for the Greater Vancouver Reaching Home Community Entity. Vancouver, BC: Metro Vancouver

[2] Lauren B. Currie, Akm Moniruzzaman, Michelle L. Patterson, & Julian M. Somers (2014). At Home/Chez Soi Project: Vancouver Site Final Report. Calgary, AB: Mental Health Commission of Canada.

[3] Yu A, Gadermann A, Palepu A. (2019). Strengths, challenges, and gaps in linkage to primary care among hospitalized individuals who are homeless in Vancouver, British Columbia. *Journal of Social Distress and the Homeless*.

## PUBLIC AWARENESS OF ALCOHOL-RELATED HEALTH EFFECTS AND THE CURRENT ADEQUACY OF PUBLIC HEALTH EDUCATION: LIVER TRANSPLANT RECIPIENTS SPEAK OUT. A SURVEY STUDY OF LIVER TRANSPLANT PATIENTS

Shirley Jiang, Katerina Schwab, Trana Hussaini, Mahmoud Omar, Ben Cox, Vladimir Marquez, Eric M. Yoshida

### Background

Amongst recreational substances in Canada, alcohol consumption incurs the highest healthcare costs. Liver transplant patients are unique stakeholders as members of the general public with lived experiences of liver disease. We sought to explore liver transplant patients' perspectives on the current state of public education on alcohol-related health effects.

### Methods

Liver transplant patients at Vancouver General Hospital were invited to participate in an anonymous online survey by mail, email, and phone from March-April 2022.

### Results

Of 198 invited patients, 153 (77%) completed the survey. Median age was 60-79 years, 59% were male, and 67% were Caucasian. Liver conditions leading to transplant included viral hepatitis (23%), autoimmune hepatitis (13%), non-alcoholic fatty liver disease (11%), and alcohol-related liver disease (10%). Knowledge of alcohol leading to liver failure was reported by 88% of patients while 57% and 50% reported awareness of potential for malignancy and heart disease, respectively. Most common sources of information reported by patients included public media (62%), family/friends (57%), and their healthcare provider (49%), with narrative comments about learning of alcohol-related health effects after liver diagnosis. Long-term future public safety measures including health warning labels, safety messaging in commercials, and education at a middle/high school level was endorsed by 37%, 42%, and 70% patients, respectively. Ninety-nine (66%) patients believed there was inadequate public education on health-related effects of alcohol and 115 (76%) patients supported government mandated health warning labels.

### Conclusion

Liver transplant patients reported a high, but not universal, awareness of alcohol causing liver failure, however a significant proportion of patients were educated by their physician, representing missed opportunities for public education outside of a transplant situation. A majority thought that current public health efforts were inadequate. It was their opinion that it is critical to implement public health interventions, such as mandatory teaching in the school system and health warning labels, to reduce the morbidity and mortality associated with alcohol.

## RESIDENT-LED COLLABORATIVE CASE-BASED ROUNDS FROM THE UNIVERSITY OF RWANDA (UR) AND UNIVERSITY OF BRITISH COLUMBIA (UBC) GLOBAL HEALTH PARTNERSHIP: LESSONS LEARNED FROM A NEW VIRTUAL COLLABORATION

Wayne Leung, Shirley Jiang, Harjot Bedi, Elina Liu, Alex Mezei, Yves Mulima, Leandre Nsanzumuhire, Gloria Shumbusho, Patrick Shumbusho, Trudy Nasmith, Marianne Vidler, Marla McKnight

### Background

The interruption of international electives due to the COVID-19 pandemic has led the Internal Medicine programs of the University of Rwanda (UR) and University of British Columbia (UBC) to develop a new initiative: virtual joint resident-led case-based rounds (R-CBR). To our knowledge, this is the first international collaborative effort amongst Canadian residency programs. The purpose of this study was to explore the perspective of residents who presented at the R-CBRs.

### Method

Four R-CBRs based on real patient cases were presented by nine paired UR-UBC residents, and delivered via Zoom to medical students, residents, and faculty from both sites. Focus groups were subsequently conducted with UR and UBC resident presenters. Resulting data was analyzed using thematic analysis conducted separately by two researchers using an inductive approach.

### Results

Four major themes were identified. The first encompassed learning points for resident presenters while preparing and conducting R-CBR. Learning points included clinical decision-making based on local epidemiology, resource availability, and clinical expertise from faculty, and the ways in which differences in health systems and culture inform care. The second theme included relationship building between UR and UBC residents and between residents at each site with faculty who assisted with case preparation. The third theme focused on challenges encountered, such as scheduling difficulties and the limited time for case presentation. The final theme was facilitators, particularly access to technology that provided both asynchronous (WhatsApp, Google documents), and synchronous (Zoom) platforms to collaboratively prepare and execute the final presentation. Another facilitator of R-CBRs was faculty support, in lending clinical expertise to case preparation and freeing residents from clinical duties to attend R-CBR.

### Conclusions

A virtual learning collaboration in the form of R-CBRs between UR and UBC provides bilateral learning and benefits for resident presenters.

## THE IMPACT OF ANTIBIOTIC CHOICE AND DURATION ON OUTCOMES OF PYOGENIC LIVER ABSCESS (PLA) IN THE CALGARY HEALTH ZONE (CHZ): A POPULATION-BASED STUDY

Jennifer A. Losie, John C. Lam, Daniel B. Gregson, Michael D. Parkins

### Background

PLA is a significant cause of morbidity and mortality. Currently, there is no clear guidance on antibiotic treatment for PLA and the role of imaging in guiding treatment duration is unclear.

### Objective

To examine the impact of antibiotic choice, treatment duration, and frequency of imaging on outcomes in patients with PLA.

### Methods

In this population-based study, we assessed radiographic studies, antibiotic treatment, and outcomes of PLA patients. CHZ residents aged  $\geq 20$  years diagnosed with PLA in 2015-2017 were included.

### Results

In total, 136 patients with PLA were identified. The median age of individuals was 62 (IQR 53-71) years, 63% were male.

The most common intravenous antibiotic was ceftriaxone (49% of subjects) with oral metronidazole, followed by piperacillin-tazobactam (34%). Patients treated with ceftriaxone and metronidazole were less likely to be readmitted within 1 year of diagnosis ( $p=0.04$ ) whereas treatment with piperacillin-tazobactam trended towards increased readmission ( $p=0.08$ ).

Amoxicillin-clavulanate was the most common oral antibiotic (51%), followed by a fluoroquinolone +/- metronidazole (33%). Use of amoxicillin-clavulanate was associated with fewer antibiotic complications ( $p=0.01$ ) whereas use of fluoroquinolones trended towards more antibiotic complications ( $p=0.09$ ).

Patients treated exclusively with intravenous antibiotics had shorter total treatment durations (median 29 [IQR 17-43] days) compared to those treated with intravenous therapy followed by oral antibiotics (median 45 [IQR 30-74] days;  $p<0.001$ ) without differences in PLA relapse or readmission ( $p=0.6$ ,  $p=0.4$ ). Patients treated with less than 2 weeks of intravenous antibiotics had more PLA relapses ( $p=0.05$ ).

There was a median of 4 (IQR 3-6) imaging studies per patient. The number of imaging studies was not associated with 1 year readmission ( $p=0.4$ ). More imaging studies were associated with longer antibiotic durations ( $p<0.001$ ).

### Conclusions

There is marked heterogeneity in PLA management. Clinical trials comparing imaging-guided therapy versus empiric therapy would help establish optimal PLA treatment approaches.

## IN RENAL TRANSPLANT RECIPIENTS, DO PERI-OPERATIVE URINE CULTURES FOR URETERIC STENT REMOVAL SUPPORT TARGETED ANTIMICROBIAL PROPHYLAXIS?

Dr. Marie Kim

### Background

Ureteric stents are routinely inserted during renal transplant, and generally removed 6 weeks later. Before stent removal, patients are treated for asymptomatic bacteriuria to prevent urinary tract infections. The approach to preoperative antibiotic prophylaxis differs between St. Paul's Hospital (SPH) and Vancouver General Hospital (VGH). At SPH, patients receive antibiotic prophylaxis if their urine cultures are positive. At VGH all patients receive prophylaxis (ciprofloxacin if urine cultures are negative).

### Objectives

To review the peri-operative stent removal urine cultures from renal transplant patients at SPH and determine whether universal ciprofloxacin prophylaxis for patients with negative urine cultures would have prevented post-procedural urinary tract infection.

### Methods

We conducted a retrospective analysis of all patients who had a renal transplant at SPH from January 1 to December 31, 2021. We included urine cultures obtained between 7 days pre-stent removal until 14 days post-removal to determine organisms identified and associated susceptibilities. Data on the quantity of organisms in culture, urinalysis, symptoms, or treatment were not collected.

### Results

149 patients had a renal transplant at SPH in 2021. Pre-stent removal, there were 138 urine cultures sent from 108 patients.

Post-stent removal, there were 58 urine cultures sent from 48 patients. Among these, there were 13 organisms with susceptibilities reported. No patients had a positive post-removal bacteriuria if they had prior cultures demonstrating "no growth". There were 2 patients with post-stent removal bacteriuria with a ciprofloxacin-susceptible organism but pre-operative urine cultures were not obtained. All of the Gram-negative bacteria were susceptible to carbapenems. Overall, there were low numbers of significant post-stent removal bacteriuria (13 positive cultures from 11 patients).

### Conclusion

These results support our approach of using targeted antibiotic prophylaxis strategy. For empiric coverage of urinary tract infections post-stent removal, carbapenems should be used.

## GLUCAGON-LIKE PEPTIDE-1 (GLP-1) RECEPTOR AGONISTS IN PATIENTS WITH OBESITY AND RHEUMATOID OR PSORIATIC ARTHRITIS: A SCOPING REVIEW

Derin Karacabeyli

### Objective

To conduct a scoping review summarizing the literature evaluating the effect of GLP-1 receptor agonists on weight and disease activity in patients with rheumatoid (RA) or psoriatic arthritis (PsA), with or without obesity

### Methods

MEDLINE, PubMed, and Embase were searched. English publications evaluating the role of GLP-1 receptor agonists in RA, PsA, and psoriasis were eligible. Data were extracted by one author. Articles were individually reviewed, then compared to identify common findings.

### Results

Fourteen studies were included, 4 pertaining to RA (2 basic science and 2 conference abstracts, including 1 case report and 1 prospective cohort) and 10 pertaining to psoriasis (2 basic science, 2 case reports, 1 combined case report/basic science, 3 prospective cohorts, and 2 randomized controlled trials). No psoriasis study reported specifically on PsA outcomes. Basic science experiments demonstrated potential immunomodulatory effects of GLP-1 receptor agonists. Reductions in oxidative stress and key proinflammatory cytokines and pathways were seen in two experiments using stimulated fibroblast-like synoviocytes as a model of RA. Similar anti-inflammatory effects were observed in psoriasis experiments through effects on invariant natural killer T cells and AMPK phosphorylation. In psoriasis, 4 of 5 clinical studies (80%) demonstrated significant improvements in Psoriasis Area Severity Index and weight/BMI. No major adverse events were reported. Common limitations included small sample sizes, short follow-up periods, and lack of control groups.

### Conclusion

GLP-1 analogues safely cause weight loss and have potential (weight-independent) anti-inflammatory effects in RA and psoriasis. Their role as an adjunct in patients with obesity and RA or PsA is understudied. This illustrates an exciting opportunity for future research.

## PERSPECTIVES IN THE USE OF "FAILURE TO THRIVE" IN HOSPITALIZED OLDER ADULTS: A QUALITATIVE STUDY

Clara Tsui, Robynn Lester, Keeva Lupton, Krista Lagimodiere, Martha Spencer

### Background

Older adults presenting to hospital with acute medical problems often have non-specific, atypical symptoms that do not fit within normal illness scripts. "Failure to thrive" (FTT) is a non-specific label frequently ascribed to older adults when such diagnostic uncertainty exists. This label has been found to have limited clinical utility, and has been associated with delays in care in a population that is medically acute.

### Objective

This study aims to identify perspectives among Internal Medicine (IM) residents that lead to the use of FTT. These perspectives, and any identified underlying factors, may reveal potential targets for intervention to reduce the use of this term.

### Methods

A qualitative study was performed based on semi-structured interviews of 9 IM residents between 2019-2021. Transcripts of the audio-recorded interviews were independently reviewed by 2 of the authors for thematic analysis.

### Results

Five major themes were identified: 1) FTT was used in cases of diagnostic ambiguity, and the label persisted throughout hospital stay despite subsequently identified medical illness; 2) FTT patients were triaged as lower priority, seen as having "no learning value"; 3) all stated FTT has negative connotations, but 50% expressed they would continue to use the term; 4) 6 of 9 residents first encountered the term in medical school clinical experiences; and 5) all residents felt they had insufficient exposure to geriatrics in residency. The apparent effects of the hidden curriculum and a lack of exposure to geriatric principles in medical education are particularly notable as areas for intervention.

### Conclusion

This qualitative study identifies several factors leading to the use of "FTT" as a label for older adults in the acute care setting, and potential targets for intervention to discourage its use.

## PHARMACOLOGICAL MANAGEMENT OF AGITATION AND DELIRIUM IN OLDER ADULTS: A SURVEY OF PRACTICES IN CANADIAN EMERGENCY DEPARTMENTS

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### Background

Agitation and delirium are common presenting symptoms for older adults in the emergency department (ED). No medications have been found to reduce delirium severity, symptoms, or mortality, yet they may cause harm. Guidelines suggest using medications only when patients are posing a direct risk of harm to themselves or others, situations which may arise frequently in the ED.

### Objective

We sought to characterize prescribing patterns of medications for agitation by ED physicians in Canadian hospitals.

### Methods

In this multi-centre study, we surveyed physicians in Vancouver, Toronto, and Quebec. Descriptive statistics were used to summarize group characteristics and starting doses were compared to order sets. Fisher exact tests were used for demographic comparison. Ordinal linear regression models were run to identify a relationship between starting dose of medications and location.

### Results

Of the 137 physicians invited, 79 (56%) completed the survey. Use of order sets was greatest in Sherbrooke and least in Vancouver. The most common medications used across sites were haloperidol, lorazepam, and quetiapine. Benzodiazepines were used across all sites but were used significantly more frequently in Vancouver than the other sites. Practice location was a significant predictor of starting dose of haloperidol, with Vancouver and Toronto having higher starting doses than Sherbrooke.

### Discussion

Higher use of order sets correlated with lower and more consistent starting doses. Benzodiazepines are used across EDs in Canada despite little evidence for effectiveness in delirium in older adults and risk of harm.

### Conclusion

Implementation of order sets may be a useful way to standardize ED management of older adults experiencing agitation and delirium. Education is needed across Canadian EDs to decrease use of prescribing dose of antipsychotics and benzodiazepines for older adults.



# POSTER PRESENTATIONS

## CHARACTERISTICS AND OUTCOMES OF TYPE 2 DIABETES FOLLOWING BARIATRIC SURGERY IN BRITISH COLUMBIA: A RETROSPECTIVE, POPULATION-BASED ANALYSIS

Davis Sam, PGY-5, Adult Endocrinology & Metabolism

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### Background

Obesity and type 2 diabetes constitute concurrent epidemics in Canada, and both may be effectively treated with bariatric surgery. However, research in British Columbia has been limited despite over 20 years of bariatric surgery experience.

### Objective

To assess patient characteristics and postoperative medication and vascular outcomes among individuals with type 2 diabetes undergoing bariatric surgery.

### Methods

We performed a retrospective review of all adults with type 2 diabetes who underwent sleeve gastrectomy or bypass surgery in British Columbia during 1996-2016 (the latest date at which population-level records could be obtained). Records were obtained from the administrative British Columbia Ministry of Health and PharmaNet databases. Individuals were identified for inclusion using relevant ICD-10 diagnostic codes associated with physician billing claims and hospital records or based on multiple diabetes medication prescriptions.

### Results

In total, 879 subjects were included (median age, 49.7 [SD 10.5] years, 82% female). The median duration of diabetes was 7.7 (SD 4.6) years, 193 (22%) individuals were receiving insulin, and microvascular complications were identified in 71 (8%) preoperatively. Most (91%) underwent Roux-en-Y bypass. During the postoperative follow-up phase, 28 (3%) of patients were still identified as having microvascular disease and the cumulative mortality was 1% over 5 years. Further analyses of changes in medication use are still being conducted at the time of submission and will be presented.

### Conclusions

In the largest review of the British Columbia bariatric surgery experience to date, we show that the typical person with type 2 diabetes undergoing bariatric surgery in British Columbia is near the fifth decade of life, is female, and has had diabetes for over 7 years. Our data suggest a lower rate of microvascular complications and a low mortality rate up to 5 years postoperatively.

## A QI PROJECT: AWARENESS OF AND ACCESS TO PHONE INTERPRETATION SERVICES ON CTU

Dr. Soma Dalai (PGY2), Dr. Matthew Michaleski

### Background

Language barriers are a frequently encountered problem on CTU and are known to impact patient care with longer admissions, poorer pain and symptom control, and difficulty obtaining informed consent. Requesting patient family members act as interpreters often creates inaccuracies and places an additional burden on caregivers, while asking other staff members can distract from their responsibilities to their own patients.

### Objective

To determine the impact of language barriers on residents, medical students, and attendings providing care on CTU amongst the 3 main teaching hospitals (RCH, VGH, SPH), and to increase awareness of official interpretation services.

### Methods

We conducted a needs assessment of 41 medical students, residents, and attendings on CTU at 3 sites (RCH, VGH, SPH) completed between January to September 2021. We found 56.1% of respondents encountered language barriers "very frequently" (defined as 1-2 times per week), and that the majority of respondents felt this impacted their care. The most common way of navigating language barriers was through family and friends (97.6%), followed by asking other staff members (75.6%), and then using "gestures, simple words, or simple English" (73.2%). Roughly 2/3 of respondents (65.9%) used official interpreter services via the iPad translators available on many medicine wards. Half of respondents (51.6%) were not aware of cellphone-based interpretation available through PHSA, but after conducting the needs assessment 100% of respondents who had not heard of this option thought it would be helpful. Several interventions were implemented over December 2021-May 2022 to encourage use of phone interpretation via orientation presentations, posters, and handouts. Data on the efficacy of these interventions is pending. Our data shows that language barriers are a common patient safety issue on CTU and that interventions are required to promote official interpretation usage.

## OUTCOME OF ELDERLY PATIENTS WITH CLASSIC HODGKIN LYMPHOMA IN BRITISH COLUMBIA

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### Background

Outcomes in elderly patients with Hodgkin lymphoma (HL) have traditionally been poor. At British Columbia (BC) Cancer, provincial treatment guidelines for elderly patients with HL have largely followed that for younger patients with modifications.

### Objective

To evaluate the survival of elderly patients with classic HL (cHL) in BC.

### Methods

Patients >60 years diagnosed with cHL from January 1961 to December 2019 were identified in the BC Cancer Lymphoid Cancer Database. Survival endpoints were estimated using the Kaplan-Meier method and compared with the log-rank test.

### Results

In total, 744 patients were identified. With a median follow-up of 6.3 years, disease specific survival (DSS) and overall survival (OS) have improved by decade comparison (both  $p < 0.001$ ), and plateaued beyond 2000 (2000-2009 vs 2010-2019 DSS  $p = 0.35$ ; OS  $p = 0.26$ ).

In the modern era (2000-present), 327/401 patients were treated with curative intent, the majority using multi-agent chemotherapy ( $n = 320$ ), typically ABVD/AVD, and the remainder with RT ( $n = 6$ ) or surgery alone ( $n = 1$ ). In the curative cohort, the 5-year OS was 65% and progression free survival (PFS) was 60%. Pulmonary toxicity occurred in 58/279 bleomycin-treated patients, and accounted for eight treatment-related deaths. An additional 12 patients died of infectious ( $n = 11$ ) or cardiac ( $n = 1$ ) complications.

Overall, 59/327 (18%) patients had relapsed/refractory disease after initial curative therapy, though only three subsequently underwent hematopoietic stem cell transplantation. A total of 21 patients received novel agents for relapsed/refractory HL (brentuximab vedotin  $n = 21$ , PD1-inhibitors  $n = 4$ ).

### Conclusions

Outcomes in elderly patients with HL have improved in recent decades, likely due to advances in therapy and supportive care. Treatment-related toxicity remains a significant concern in all patients >60 years, and bleomycin should be avoided. Novel therapies may provide benefit, particularly in relapsed/refractory HL.

## ULTRASONOGRAPHIC EVALUATION OF MUSCLE QUALITY AFTER ANTERIOR INTEROSSEOUS TO ULNAR NERVE TRANSFER FOR CHRONIC CUBITAL TUNNEL SYNDROM

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### Introduction

Surgical management for chronic cubital tunnel syndrome (CCTS) may be augmented by transferring a branch of the anterior interosseous nerve (AIN) supplying pronator quadratus to the distal ulnar motor bundle (AIN-U), to improve ulnar intrinsic muscle strength. Our study used ultrasound to measure muscle quality after AIN-U.

### Materials & Methods

In this cross-sectional study, 8 adults (2 females and 6 males, mean age  $57 \pm 12$  years) were evaluated at a mean  $34 \pm 15$  months post AIN-U. The dominant arms of 8 healthy individuals (3 females and 5 males, mean age  $32 \pm 6$  years) were evaluated as controls. Axial B-mode ultrasound images were captured of the first dorsal interossei (FDI), abductor digiti minimi (ADM), and pronator quadratus (PQ) using standardized acquisition parameters. Images were manually segmented to determine muscle thickness and mean echogenicity. We also obtained compound muscle action potential (CMAP) amplitudes of FDI and ADM. Lastly, pinch grip strength was assessed using a grip dynamometer.

### Results

Comparing AIN-U arms to controls, there was a significant difference in FDI echogenicity ( $105.9 \pm 18.9$  vs.  $58.0 \pm 14.3$ ,  $p=0.0086$ ), and PQ echogenicity ( $140.0 \pm 14.0$  vs.  $61.6 \pm 14.4$ ,  $p=0.0022$ ). There was no significant difference ( $p>0.05$ ) in FDI thickness, ADM thickness, ADM echogenicity or PQ thickness. Echogenicity correlated significantly with CMAP in FDI ( $r=-0.71$ ,  $p=0.0002$ ), but not in ADM ( $r=-0.36$ ,  $p=0.097$ ).

### Conclusions

The findings of our study are: 1) after AIN-U there is a difference in FDI muscle echogenicity compared to control arms, indicative of muscle fibrosis, 2) ADM echogenicity was similar between AIN-U and control groups, likely reflective of the preferential fascicular involvement of FDI in CCTS, 3) FDI muscle echogenicity negatively correlates with CMAP amplitude, highlighting the utility of this parameter in augmenting clinical and electrodiagnostic evaluations. Our results also suggest that chronic muscle fibrosis from CCTS persists after AIN-U.

## VENOUS THROMBOEMBOLISM IN CHINESE PATIENTS: A ROLE FOR ETHNIC PROFILING?

Julia Varghese

### Background

Venous thromboembolism (VTE) is a major cause of morbidity worldwide. Current VTE guidelines are based on data derived from predominantly Caucasian patients. Yet, the rate of VTE is lower in East Asians and cancer is a common provoking factor.

### Objective

The primary objective of our study is to describe the characteristics of VTE in East Asian vs non-East Asian patients in a multiethnic cohort, referred to the Vancouver General Hospital (VGH) Thrombosis Program. We will analyse comparative rates of provoked and unprovoked VTE, including cancer-associated VTE. We hypothesize that a significant proportion of VTE occurring in East Asian patients is provoked by cancer compared with non-East Asian patients.

### Methods

We conducted a retrospective analysis of patients with acute VTE referred to the VGH Thrombosis Program between January 1 and December 31, 2015. Patients were identified through the VGH Thrombosis Program's database. Information was collected through chart reviews of the program's electronic medical records and the BC Cancer registry, including patient demographics, VTE characteristics and presence of provoking risk factors. Ethnicity was collected through chart records and in instances where ethnicity was not available, a validated surname identification list by Shah et al. was applied to identify patients of Chinese descent.

### Results

488 patients were identified of which 57 patients were East Asian. 70.2% (n=40) of East Asians had cancer associated thrombosis (CAT) versus 49.2% (n=212) in the non-East Asian cohort, ( $p=0.003$ ). East Asian patients with VTE were more likely to be female ( $p=0.028$ ), have lower body weight ( $p=0.003$ ), less likely to smoke cigarettes ( $p=0.046$ ) and trended towards older age than the rest of the cohort ( $p=0.071$ ).

### Conclusion

East Asian patients with VTE represent a smaller proportion of VTE cases seen annually but are more likely to present with CAT. Clinicians should be vigilant regarding a potential cancer diagnosis in this patient population.

## CLINICAL OUTCOMES IN FRESH VERSUS CRYOPRESERVED HEMATOPOIETIC STEM CELL PRODUCTS IN BC: A RETROSPECTIVE STUDY

Dr. Bo Angela Wan

Supervisors: Dr. Kevin Hay, Dr. Claudie Roy

### Background

Allogeneic hematopoietic stem cell transplants (HSCT) have been the mainstay of treatment of many hematologic malignancies. Conventionally, fresh donor hematopoietic progenitor cell (HPC) products are used but the COVID-19 pandemic forced many centres, including ours, to rely on cryopreserved HPC products.

### Objective

To characterize the clinically relevant allogeneic HSCT outcomes in cryopreserved HPC products in BC, and to identify differences compared to a recent historical cohort of patients who received fresh HPC products.

### Methods

A retrospective chart review was conducted on all adult patients who received a cryopreserved bone marrow or peripheral blood HSCT in British Columbia between February 2017 and January 2022. Data including HPC product characteristics, patient demographics, and clinical outcomes were extracted and compared to an existing database of patients who received fresh HPC products between June 2017 and May 2020. Baseline characteristics and outcomes including engraftment rate, complications, and relapse will be described. Adjusted probabilities of overall survival and disease-free survival will be estimated with a Cox proportional-hazards regression model. The probabilities will be adjusted for age, diagnosis, transplant type, disease status at transplantation, and CMV status. Survival functions will be compared with a historic cohort of HSCT using fresh HPCs

### Results

138 frozen HPC transplants and 133 fresh HPC transplants were included in our study. The median age was 56 (Inter quartile range 40, 63), and 39% were female. Myeloablative condition was performed in 70% of cryopreserved transplants versus 78% of fresh transplants. Peripheral HPC products represented 90% of cryopreserved transplants vs 92% of fresh transplants. Neutrophil and platelet engraftment occurred on average at 20 and 21 days respectively in cryopreserved transplants, versus 21 and 25 days in fresh transplants. Statistical analysis is pending at the time of writing and will be included in the presentation.

## WHEN DO TRAINEES ACHIEVE COMPETENCY IN PERFORMING ENDOSCOPIC SUBMUCOSAL DISSECTION: A SYSTEMATIC REVIEW

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### Background

Endoscopic submucosal dissection (ESD) is an established organ sparing curative endoscopic resection technique for the management of pre-malignant and superficially invasive lesions of the gastrointestinal tract. However, little is understood of its learning curve with suggested competency measures including en bloc resection, complete (Ro) resection, adverse events and resection speed. We aimed to perform a systematic review on when competency is achieved in ESD.

### Methods

Two authors independently searched MEDLINE and EMBASE (1946 to Feb 2022) for full-text original citations including grey literature assessing the ESD learning curve. A learning curve was defined as an assessment of competency as a function of increasing trainee experience. Thresholds for competency was defined as en bloc resection  $\geq 90\%$ , Ro resection  $\geq 80\%$ , perforation rate  $\leq 3\%$  as per the European Society of Gastrointestinal Endoscopy recommendations.

### Results

Thirty-nine studies with 138 trainees and 8137 ESD lesions were included. En bloc resection, Ro resection, perforation rate was used as markers of competency in 29, 24 and 27 studies, respectively. Baseline experience in gastroscopy, colonoscopy, endoscopic mucosal resection and ESD were 800-10,000, 100-10,000, 4-700 and 0-300 procedures, respectively. For studies where aggregated competency was achieved across en bloc, Ro and perforation, it was reached in the stomach, colorectum and for multiple sites in 29 - 100, 30 - 247, and 39 procedures, respectively.

### Conclusions

Competency in ESD is achieved over a wide range of procedures with variability dependent on organ site and baseline level of training and ESD experience. With the widespread adoption of ESD, standardization of training and the assessment of competency are needed.



## A SCOPING REVIEW OF THE VALIDITY EVIDENCE FOR ENTRUSTMENT RATING SCALES

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### Background

Entrustment ratings are intended to reflect a supervisor's entrustment of a task to a learner and this approach to workplace-based assessment is increasingly common. We undertook a scoping review of the current validity evidence of entrustment-based rating scales.

### Methods

We used systematic review methodology to search, identify, appraise and abstract relevant articles from 2005 to September 2020, across 4 databases. A total of 1613 potentially relevant articles were identified. After applying the inclusion and exclusion criteria, 128 articles met the inclusion criteria for this scoping review. Thematic analysis of the included studies was organized according to Kane's validity framework, with iterative discussion among authors until consensus was reached for interpretation of the results.

### Results

One hundred and twenty-three included studies were quantitative and of moderate methodological quality and 5 were qualitative. The majority of studies examined postgraduate learners (88%) who were assessed by a single faculty member (81%) assessing a procedural task (63%). The Zwisch scale was the most commonly examined entrustment rating (26%) followed by the OSCORE (18%). For assessment of a procedural task, there was consistency surrounding the purpose of the assessment. However, for non-procedural tasks there were a range of assessment intents. While many components of the validity argument have been examined, there were limited data on the reliability of the assessments and limited evidence examining the implications of the assessments for both learners and programs.

### Conclusions

Scholarship on entrustment-rating scales is rapidly growing, particularly in the surgical context. However, significant gaps in the validity argument supporting these tools remain and further research is required.

## THE ASSOCIATION BETWEEN MEDIAN INCOME AND SEVERITY OF PULMONARY HYPERTENSION AT DIAGNOSIS AND RISK AT FOLLOW UP IN A PUBLIC HEALTH CARE SYSTEM

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### Introduction

Patient income has been associated with clinical outcomes in pulmonary arterial hypertension (PAH). However, much of this work was done in private health care systems. In Canada, the public health care system covers the majority of health care costs. We evaluated whether a patient's neighborhood median after tax income (ATIPPE) remained associated with severity of illness at diagnosis and markers of risk at most recent follow up.

### Methods

We identified all WHO Group 1 or 4 patients from our PAH registry. Postal code data was used to classify patients according to median income using ATIPPE (neighborhood after tax income per single person equivalent). ATIPPE was generated using statistics Canada. In our study, we compared the baseline cardiac catheterization data by income to evaluate whether low income was associated with late presentation. Using available follow up catheterization, 6 minute walk test, functional class, biomarker and echocardiographic data, we classified patients as low, intermediate or high risk. We identified whether median income was associated with risk at follow up. Multivariate logistic regression and linear regression were used as appropriate and results were adjusted for age, sex and body mass index. P-values < 0.01 were taken as significant given multiple comparisons.

### Results

Of 344 patients identified, the mean age was 61±16 years, and 71% were females. Mean ATIPPE was 46,000 ±12,000 Canadian dollars/year. Full catheterization data was available for 344 patients at baseline. For each \$1000 increase ATIPPE, there were lower mean PA pressure and pulmonary vascular resistance (-0.13 mmHg, 95%CI -0.24, -0.02, P=0.02) and (-0.06 WU, 95%CI -0.1, -0.01, P=0.015), respectively. At last follow up, NYHA data was available for 324 patients. 6MWD and echocardiogram data was available for 327 patients. For each \$1000 increase in ATIPPE, there was a higher likelihood of low risk classification (OR 1.01, 95%CI 1.00-1.03, P=0.006).

### Conclusions

In our large tertiary PAH referral center, operating in a country with a public health care system, we found a strong trend towards less advanced disease at diagnosis and significantly lower risk at follow up. This suggests that even in a public health care system, income is associated with outcomes in PAH.

## NATURAL HISTORY OF UNTREATED IDIOPATHIC FREQUENT PREMATURE VENTRICULAR COMPLEXES

Jacky Tang, Michael Thiebert, Farshad Hosseini, Marc Deyell

Supervisor: Dr. Marc Deyell

### Background

Frequent premature ventricular complexes (PVCs) have been associated with the development of reversible cardiomyopathy, although the risk is unclear in patients without underlying structural heart disease. First line medical therapy has not been shown to consistently provide significant PVC burden reduction compared to conservative monitoring, and catheter ablation carries a small but serious risk of major complications.

### Objective

We aimed to study the natural history of frequent PVCs in the absence of structural cardiac disease by examining the rate of spontaneous resolution and development of left ventricular dysfunction.

### Methods

The BC-PVC registry prospectively enrolled patients with frequent PVCs (defined as  $\geq 5\%$  PVC burden in 24 hours) between 2012 to 2022. Patients without structural heart disease who were not initiated on suppressive therapy (anti-arrhythmic drugs or catheter ablation) were followed serially with ambulatory ECG and echocardiology. The primary arrhythmic outcome was PVC resolution (defined as  $< 1\%$  PVC burden in 24 hours). The planned statistical analysis will include time to primary arrhythmic outcome described by a Kaplan-Meier curve, while univariate predictors of spontaneous resolution will be analyzed with a Cox proportional-hazards regression model.

### Results

286 patients met inclusion criteria (mean age 54.4 years, 55.6% female) with a median initial PVC burden of 21.0%. The following are preliminary descriptive statistics (formal analysis pending). Spontaneous PVC resolution was documented in 119 of 286 patients (41.6%). 16 of 286 patients (6.0%) met the secondary adverse composite outcome (new left ventricular dysfunction, heart failure hospitalization, or cardiovascular mortality). There were no cases of cardiovascular mortality. Class I/III anti-arrhythmic medications and/or catheter ablation was eventually initiated in 36 of 286 patients (12.6%).

## EVALUATING THE UTILITY AND SAFETY OF A RAPID ACCESS CHEST PAIN CLINIC AT A QUATERNARY REFERRAL CENTRE

Siavash Ghadiri, Annie Chou, Carolyn Taylor, Ken Kaila, Brett Heilbron, Simone Cowan, Christopher Lee, Michael Slawnych, Krishnan Ramanathan

### Introduction

Chest pain is a common Emergency Room (ER) presentation. Although most patients will have non-ischemic causes, the consequences of missing a coronary diagnosis can increase the risk of adverse events. Rapid Access Chest Pain Clinics (RACPC) help provide prompt assessment to identify patients at high risk and for early interventions. We aimed to characterise the findings from the first RACPC in Vancouver.

### Methods

Consecutive individuals with chest pain, with low or intermediate risk for having a coronary etiology were referred to the RACPC at St. Paul's Hospital, after an acute coronary syndrome had been excluded, since September 2020. Patients with an existing cardiologist and those with known coronary atherosclerosis and prior revascularization were excluded. Prior to the referral to the RACPC the ER physicians used an algorithm based on current knowledge to determine the optimal investigation for identifying those with a coronary etiology. All patients were then reviewed urgently by a cardiologist following investigations. Patient characteristics were then abstracted retrospectively from the medical records. This project was approved by the UBC ethics board.

### Results

In the initial  $n = 100$  consecutive patients since the RACPC inception, 64 individuals (56% male, mean age  $55 \pm 14.7$  years) completed evaluation. The mean time from ER referral to RACPC review was 10.1 days. The most frequent assessment designated using the algorithm was coronary computed tomography angiography (CCTA) 45 and 43% respectively. Coronary disease was identified in  $n = 16$  (25%), mainly with CCTA (87%) with a mean segment score of 2.8. Only 2 (3%) patients were referred for outpatient invasive coronary angiography. Among assessed patients  $n = 5$  represented to ED within 12 months for chest pain, and none within 30 days. There was no reported myocardial infarction, stroke or death reported.

### Conclusion

In low to intermediate risk individuals with a new onset chest pain, RACPC appears to be a safe and effective pathway for assessment and management. However, further assessment with larger numbers is needed to fully determine the utility and safety of RACPC.

## PALPITATIONS IN PEDIATRIC PATIENTS POST-ABLATION FOR TACHYARRHYTHMIAS

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### Background

Catheter ablation is a safe and effective first-line therapy for tachyarrhythmias. Post-ablation patients may continue to experience palpitations in the setting of sinus rhythm. Since palpitations are a common symptom in the general population, we sought to gain a better understanding of post-procedural palpitations.

### Objective

To investigate if patients who have undergone ablation for tachyarrhythmia have palpitations and other somatic complaints more frequently than the general population.

### Methods

Pediatric patients who had undergone ablation for tachyarrhythmia at BC Children's Hospital from 2009 to 2019 and healthy controls were invited to participate in a REDCAP survey about palpitations. Demographics, palpitation symptoms, frequency, duration, and need for medical attention were collected and compared using Chi-square.

### Results

Out of 403 ablation patients who were emailed the survey, we received responses from 75 patients (response rate of 19%; mean age=  $20 \pm 4.6$  years, 52% male) and 62 controls (age=  $20 \pm 4.6$  years, 44% males) (Table 1). Forty-three (57%) patients experienced palpitations beyond the initial 4 weeks post-ablation of which 81% (35/43) reported their palpitations feeling different. Majority of patients (30/43, 70%) had continued palpitations for years after ablation. Tachyarrhythmia recurrence rate post-ablation was 7.2%. There was no difference in incidence of palpitations experienced between patients and controls ( $p=0.22$ ). Patients were more likely to experience their palpitations as skipped/extra beats or heart fluttering and had more chest fluttering than controls ( $p<0.001$ ). Controls reported more chest symptoms compared to patients ( $p=0.004$ ), however, patients sought medical attention more often for their chest symptoms compared to controls ( $p=0.01$ ).

### Conclusion

The prevalence of palpitations did not differ in ablation patients compared to the general population; however, patients reported that their palpitations felt different post-ablation and were more likely to seek medical attention. This suggests that pediatric patients with tachyarrhythmias may have heightened awareness/vigilance due to their history. Clinicians can incorporate this into procedural counselling to reduce the concern and need for medical attention.

## NEW-ONSET IMMUNE-MEDIATED DISEASE FOLLOWING SARS-COV-2 VACCINATION: A CASE SERIES

Dr. Sarah Hansen, India Dhillon, Dr. Natasha Dehghan, Dr. Jennifer Reynolds

### Background

The COVID-19 vaccine campaign is the largest and fastest in history, and the first use of mRNA vaccines outside a research setting. Limited evidence exists regarding the risk of developing immune-mediated disease [IMD] other than myocarditis and vaccine-induced thrombotic thrombocytopenia following SARS-CoV-2 vaccination.

### Objective

To report the baseline characteristics and outcomes of patients with new-onset of IMD following SARS-CoV-2 vaccination referred to rheumatology in BC.

### Methods

Adult patients who developed new-onset IMD within 30 days of receiving a dose of SARS-CoV-2 vaccine between December 2020 and March 2022 were identified by survey of the BC Society of Rheumatology. Relevant data was extracted by retrospective chart review.

### Results

Thirty patients with IMD following SARS-CoV-2 vaccination were identified. Seventy percent were female. The mean age was 59 years [range: 26-80]. The mean time from vaccine administration to symptom onset was 8.56 days [range: 0-30]. New-onset IMD arose following both mRNA [Pfizer-BioNTech n=15, 50%; Moderna n=4, 13.3%] and viral vector [AstraZeneca n=6, 20%] vaccines, and following the first, second, and third doses in 53.3%, 33.3%, and 10.0% of cases respectively. Inflammatory arthritis [n=15, 50%] was the most common diagnosis. Three patients had connective tissue disease [SLE, anti-synthetase syndrome, rapidly progressive ILD and skin thickening without Raynaud's, nailfold capillary abnormalities, or ANA positivity], three had vasculitis [giant cell arteritis, cryoglobulinemic vasculitis, and isolated aortitis], two had adult-onset Still's disease, and one had eosinophilic fasciitis. Three patients had life-threatening disease, five had severe disease requiring hospitalization that was not life-threatening, 19 had moderate disease, and three had mild disease. The majority [73%] had a chronic course requiring continued DMARD administration at last follow-up.

### Conclusions

Individuals without pre-existing rheumatologic disease may develop IMD following SARS-CoV-2 vaccination. IMD may be chronic and require initiation of long-term immunosuppression. Given the uncontrolled nature of this study, no conclusions can be drawn as to the relative risk of developing IMD following SARS-CoV-2 vaccination relative to the risk following other vaccines or the baseline population rate.

## SURVEY ON HERPES ZOSTER (HZ) VACCINATION IN PATIENTS WITH INFLAMMATORY BOWEL DISEASE (IBD)

Shirley Jiang, Daud Akhtar, Brian Bressler

### Background

Patients with inflammatory bowel disease (IBD), who require certain immunosuppressive medications, are at higher risk of herpes zoster (HZ) but have lower HZ vaccination rate compared to the general population. We sought to determine the self-reported rate of HZ vaccination and preferences of IBD patients under the care of the IBD Centre of BC (a quaternary care centre for the management of patients with IBD).

### Methods

All current patients greater than 18 years of age from the IBD Centre of BC were invited by email to participate in an anonymous online Qualtrics survey from April 6-22, 2022.

### Results

Of 1218 patients invited to participate, 179 patients (14%) responded to the survey. Most (70%) patients were over age 40, 94 (56%) were female, and 144 (84%) were Caucasian. Twelve (7%) patients reported smoking. There were a similar number of patients with Crohn's disease (51%) and ulcerative colitis (50%). Most common treatments were advanced drug therapies (biologics and small molecules; 56%), mesalamine (18%), methotrexate (5%), and steroids (5%). HZ vaccination rate was 17%, of which 62% had the recombinant vaccine (Shingrix). All vaccinated patients were over 40-60 years old and/or on advanced drug therapies. Reasons for remaining unvaccinated were not being offered the vaccine (60%), insufficient information (9%), and being too young (4%). Thirty-three (19%) patients reported having HZ infection, of which 11% had post-herpetic neuralgia and 6% had eye symptoms related to their HZ infection. Other recommended vaccines had higher rates of uptake at 97%, 70%, 68%, and 50% for COVID-19, influenza (most recent year), hepatitis B, and pneumococcal, respectively.

### Conclusion

HZ vaccination rate in IBD patients, being managed at the IBD Centre of BC, is low compared to uptake of other vaccines. Increasing HZ vaccination awareness in primary care and patient education could potentially reduce local HZ morbidity.







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