TWO ROADS DIVERGED IN A YELLOW WOOD, AND SORRY I COULD NOT TRAVEL BOTH AND BE ONE TRAVELER, LONG I STOOD AND LOOKED DOWN ONE AS FAR AS I COULD TO WHERE IT BENT IN THE UNDERGROWTH; THEN TOOK THE OTHER, AS JUST AS FAIR, AND HAVING PERHAPS THE BETTER CLAIM, BECAUSE IT WAS GRASSY AND WANTED WEAR; THOUGH AS FOR THAT THE PASSING THERE HAD WORN THEM REALLY ABOUT THE SAME, AND BOTH THAT MORNING EQUALLY LAY IN LEAVES NO STEP HAD TRODDEN BLACK. OH, I KEPT THE FIRST FOR ANOTHER DAY! YET KNOWING HOW WAY LEADS ON TO WAY, I DOUBTED IF I SHOULD EVER COME BACK. I SHALL BE TELLING THIS WITH A SIGH SOMEWHERE AGES AND AGES HENCE: TWO ROADS DIVERGED IN A WOOD, AND I—I TOOK THE ONE LESS TRAVELED BY, AND THAT HAS MADE ALL THE DIFFERENCE.
What does poetry offer an academic research organization dedicated to enhancing cardiovascular health? Perhaps John Burnside’s reflections help us with the answer in his definition of poetry’s value “It is, in its subtle yet powerful way, a discipline for re-engaging with a world we take too much for granted.”

And thus for me the inspired choice that emerges from Robert Frost’s famous poem “The Road Not Taken” is highly relevant to presenting our work elsewhere, importantly in the spring of 2014, we received key visitors from our two key academic partners, Stanford University and the Duke Clinical Research Institute. Eric Peterson (DCRI) and Lisa Berdan (Director of Global Megathalas) proceeded on from their CVC visit to Banff to participate in a new CVC venture ably led by Tracy Temple and detailed herein the Research Colloquium was a unique experience and resounding success greatly appreciated by investigator and coordinator of the uncertainties associated with novel research. We do not yet understand why this allergy occurred but it is imperative that we learn more in order to ensure that we can pursue related lines of new treatment and avoid unnecessary hazards. This is part of the uncertainty in travelling new paths while searching for innovative solutions to the unmet needs of our patients.

In September of 2014 I was both surprised and honored to receive the University Cup for “outstanding distinction in scholarly research, teaching and service to the U of A and to the greater community”. In reflecting on this award I was especially conscious of some overarching themes that framed this event for me, the privilege of working in an academic-university based health care system that provides the freedom to pursue creative ideas, the opportunity to fulfill my social contract to the broader community of tax payers that have funded my education and career, the collaborative spirit of many outstanding colleagues and the support of our splendid CVC team who have been so pivotal in the work we have together accomplished.

I hope you take time to peruse our 2014 annual report to better understand who we are, what we do and how we are progressing in pursuit of our mission. Constructive feedback from our key stakeholders is always appreciated as we strive to be better in the days ahead on the road less travelled.
Vision
Generate, translate and disseminate knowledge on novel diagnostic and therapeutic strategies in cardiovascular medicine acquired through collaborative research to enhance the health of the citizens of Alberta, Canada, and the world.

Mission
Aligned with the University of Alberta and the Mazankowski Alberta Heart Institute (MAHI), our mission is to:
- Design, conduct, analyze and disseminate findings arising from novel clinical research
- Interrogate clinical trial, registry and population health data to evaluate outcomes, identify unmet needs and inform future basic and clinical research directions
- Identify, inspire and nurture the next generation of health researchers and professionals.

Core Values
QUALITY
Aspire to the highest standard of work while respecting a balanced life perspective. Attract, mentor and retain high quality colleagues and collaborators with similar core values.

COLLABORATION
Promote and support an outstanding team that integrates a diversity of knowledge, experience, ideas, and skills supportive of our mission/vision.

INTEGRITY
Perform our roles in an ethical framework which enhances our reputation as honest, trustworthy and responsible.

RESPECT
Create an innovative, engaging and inclusive work environment, appreciative of individual differences and contributions. Our workplace will be conducive to personal growth and development that is aligned with our overall mission.
EXCELLENCE IS NEVER AN ACCIDENT.
IT IS ALWAYS THE RESULT OF HIGH INTENTION,
SINCERE EFFORT,
AND INTELLIGENT EXECUTION;
IT REPRESENTS THE WISE CHOICE OF MANY ALTERNATIVES -
CHOICE, NOT CHANCE,
DETERMINES YOUR DESTINY.

— ARISTOTLE

HOW DOES YOUR KNOWLEDGE STAND TODAY?
WHAT MUST YOU EXPECT TO FORGET?
WHAT REMAINS FOR YOU TO LEARN?

— OLIVER WENDELL HOLMES
Cycle of Quality

As a learning organization committed to enhancing the health of current and future generations through research, CVC relentlessly pursues the generation, translation and dissemination of new knowledge addressing unmet clinical needs. This culture of learning embraces the cycle of quality that begins with health science discovery followed by its application to human disease using careful quantitative and qualitative measures. For discovery to have an impact, its efficacy must be first examined in controlled populations. Subsequently, the effectiveness needs to be evaluated through performance measures in carefully crafted patient registries acquired in selected disease states. To complete this cyclical process there must be successful dissemination of new knowledge into clinical practice resulting in meaningful differences in health outcomes at the population level. Health economic evaluation, demonstrable return on investment, and responsive health policy enrich the success and timeliness of this journey. Professional and public education are seminal components of the process occurring in parallel. The inevitable destination of this construct is a new appreciation for the unmet needs of the population and re-entry into the cycle to continue the quest for improvement in clinical and/or health system outcomes.

Value Proposition of an ARO

An academic research organization (ARO) possesses scholarly values of inquiry and truth and shares knowledge in an ethical framework. Dedicated to enhancing public health, it values discovery, novel approaches and methodologies over profit. Intent upon maximizing the return on research investment, an ARO strives to exceed the operational efficiencies of a clinical research organization (CRO), and intentionally seeks funding from diverse sources beyond industry. An ARO is almost always embedded in a University and therefore reserves their right to publish their insights with objectivity. An ARO functions on a not for profit basis, and renews all sources of capital, both financial and intellectual, into the education of the next generation of health professionals, and thereby aims to fulfill its social contract to promote the public good.

An ARO possesses the ability to take discovery and preclinical science and translate it into clinical practice through the application of qualitative and quantitative measurement. Professional and public education are integral components of this process which occurs in parallel. The inevitable destination of this construct is a new appreciation for the unmet needs of the population and re-entry into the cycle to continue the quest for improvement in clinical and/or health system outcomes.

Adapted Col®®: Aris toasted 2020

Qualitative and Quantitative Measurement
Professional and Public Education
Health Economic Evaluation
Responsive Health Policy

For the Canadian VIGOUR Centre

Forging New Paths
2014 Metrics

- 322 monitoring visits that occurred in Canada.
- 52 publications that CVC’s body of research produced.
- 133 Principal Investigators participating in CVC managed trials.
- 5,498 ECGs analyzed by CVC.
- 144 Principal Investigators participating in CVC managed trials.
- 10 industry and grant funded projects currently underway.
- 500,000+ size of data repository reflecting health of Albertans with cardiovascular disease.
Financial Summary

REVENUES FROM INDUSTRY-SPONSORED CLINICAL TRIALS AND EXPENSE RECOVERY
January 1, 2014 - December 31, 2014

Grants

<table>
<thead>
<tr>
<th>PROJECT</th>
<th>SPONSOR(S)</th>
<th>GRANT HOLDERS</th>
<th>TERM</th>
<th>TOTAL GRANTED (CAD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Providing Rapid Out of Hospital Acute Cardiovascular Treatment (PROACT-4)</td>
<td>Heart and Stroke Foundation, Mazankowski Alberta Heart Institute, University Hospital Foundation</td>
<td>Justin Ezekowitz (PI), Paul Armstrong, Padma Kaul, Robert Walsh</td>
<td>2014-2017</td>
<td>$233,000</td>
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<tr>
<td>SODIUM HF</td>
<td>Canadian Institutes of Health Research</td>
<td>Justin Ezekowitz</td>
<td>2013-2017</td>
<td>$698,301</td>
</tr>
<tr>
<td>Team Grant: Alberta Heart Failure Etiology and Analysis Research Team (Alberta-HEART)</td>
<td>Alberta Innovates-Health Solutions</td>
<td>Jason Dyck (PI), Todd Anderson (PI), Finlay McAlister, Justin Ezekowitz, Padma Kaul</td>
<td>2009-2014</td>
<td>$5,000,000</td>
</tr>
<tr>
<td>Canadian Health Outcomes, Performance and Efficiency (CanHOPE) - project for analysis of AMI and stroke care data for policy making</td>
<td>Heart and Stroke Foundation</td>
<td>Arto Ohinmaa (PI), Scott Klarenbach, Padma Kaul, Philip Jacobs</td>
<td>2013-2014</td>
<td>$109,450</td>
</tr>
<tr>
<td>Gestational Diabetes Mellitus (GDM) in Alberta</td>
<td>Canadian Institutes of Health Research</td>
<td>Padma Kaul (PI)</td>
<td>2014-2017</td>
<td>$278,139</td>
</tr>
</tbody>
</table>

Total Revenue: $5,212,856.80
Use of Renin–Angiotensin System Blockers in Acute Coronary Syndromes

Findings From Get With the Guidelines-Coronary Artery Disease Program

Kevin R. Bainey, MD, MSc; Paul W. Armstrong, MD; Gregg C. Fonarow, MD; Christopher P. Cannon, MD; Adrian F. Hernandez, MD; Eric D. Peterson, MD, MPH; W. Frank Peacock, MD; Warren K. Laskey, MD; Xin Zhao, MS; Lee H. Schwamm, MD; Deepak L. Bhatt, MD, MPH

Background—Angiotensin-converting enzyme inhibitors (ACEI) or angiotensin receptor blockers (ARB) initiated after acute myocardial infarction (AMI) reduce heart failure, and improve overall survival in landmark clinical trials. As such, the American College of Cardiology/American Heart Association class 1 indication (left ventricular dysfunction or medical history of heart failure, diabetes mellitus, or chronic kidney disease) is associated with lower use (adjusted odds ratio, 0.55; 95% confidence interval, 0.48–0.63 and adjusted odds ratio, 0.58; 95% confidence interval, 0.50–0.69, respectively).

Methods and Results—We performed an observational analysis of 60,847 patients admitted with an acute coronary syndrome and discharged home from 311 US hospitals participating in the Get With the Guidelines-Coronary Artery Disease Program from January 2005 to December 2009. Among the 60,847 patients with an American College of Cardiology/American Heart Association class I indication for ACEI/ARB therapy, and the use varies by patient factors. In particular, the low likelihood of ACEI/ARB after coronary syndrome and discharged home from hospitals participating in the Get With the Guidelines-Coronary Artery Disease Program. Approximately, one in five eligible patients failed to receive American College of Cardiology/American Heart Association class I guideline recommended ACEI/ARB therapy. Interestingly, in-hospital coronary artery bypass grafting and renal insufficiency were independently associated with lower use (adjusted odds ratio, 0.47; 95% confidence interval, 0.40–0.55 and adjusted odds ratio, 0.46; 95% confidence interval, 0.38–0.56, respectively).

Conclusions—Failure from large US national registry suggest that 1 in 5 eligible patients hospitalised for acute coronary syndromes failed to receive an American College of Cardiology/American Heart Association class I indication for ACEI/ARB therapy. Of note, among lower risk patients (ie, absence of LV dysfunction, hypertension, or diabetes mellitus), the use of ACEI or ARB is reasonable and should be considered based clinical judgment.

Key Words: acute coronary syndrome • angiotensin-converting enzyme inhibitors • angiotensin receptor blockers

References


ABORTED MYOCARDIAL INFARCTION IN ST-ELEVATION MYOCARDIAL INFARCTION: INSIGHTS FROM THE STRATEGIC REPERFUSION EARLY AFTER MYOCARDIAL INFARCTION TRIAL

Dr. Neda Danai Maliski—a trainee working in our core ECG laboratory, ably assisted by Gray Zhang and Dr. Cindy Westerhout—examined how often heart attacks could essentially be avoided (so-called “aborted MI”) according to the use of pharmacoinvasive strategy vs. percutaneous coronary intervention (PCI) in the STREAM (Strategic Reperfusion Early After Myocardial Infarction) trial.

The key messages published in the journal Heart were:
1. Aborted MI has been known to occur when reperfusion therapy in ST-elevation MI is begun early and be associated with improved outcomes in observational cohorts.
2. This report was the first prospective randomized trial to study the frequency and outcomes of aborted MI with pharmacoinvasive versus primary PCI treatment early after symptom onset. It shows that there are significantly more aborted MIs with the pharmacoinvasive approach.
3. This study emphasizes the advantage of a pharmacoinvasive approach in STEMI patients who cannot undergo primary PCI within one hour of symptom onset.

Dr. Maliski, a medical graduate from Iran, is now pursuing further training in New York with the intention of becoming an academic cardiologist and hopes to pursue her career in Canada.

PROVIDING RAPID OUT OF HOSPITAL ACUTE CARDIOVASCULAR TREATMENT 3 (PROACT-3)

A few areas in medicine require quick thinking, swift decisions and the informed action. Paramedics take this action in the ambulance when seeing patients with chest pain or shortness of breath, and in the PROACT-3 trial, they and their ER colleagues had additional early troponin and BNP data to guide their decisions. In this trial, lead author Jason Eikelboom along with a truly pan-Edmonton collaborative group representing all five hospitals, emergency departments and emergency medicine and our VIGOUR centre, did not demonstrate that we could shorten the overall time in the ER by using these earlier biomarkers, but has allowed us an instructive look at what happens in forward thinking health systems: work collaboratively, test new ideas, study results and retool with a modified plan. All of this was possible with team work importantly facilitated by funding from the University Hospital Foundation, Heart and Stroke Foundation of Canada and our industry partner Alere.

Clinical Research
PROVIDING RAPID OUT OF HOSPITAL ACUTE CARDIOVASCULAR TREATMENT 3 (PROACT-3)

Juris A. Eikelboom, MBBS, MSc,1,2,3 Robert C. Welsh, MD,1,2,3 Courtney Gubide, BA1,2,3 Neil Buu, MD,1,2,3 William Koshi, MBBS, DMC,1,2,3 Fazl Khaliq, MD,1,2,3 Thomas L. Koshy, MD,1,2,3 Darius Karpf, MD,1,2,3 Santu Sharma, MD,1,2,3 Yael Souloumiac, MD,1,2,3 Wayne Tyndall, MD,1,2,3 Dale White,1,2,3 Cynthia M Westerhout,1,2,3 and Paul W. Armstrong1,2,3

1Canadian VIGOUR Centre and University of Alberta, Edmonton, Canada
2Department of Research Innovation, Li Ka Shing Centre for Health Research, University of Alberta, Edmonton, Canada
3Biomedical Research Unit, University of Alberta Hospital, Edmonton, Alberta, Canada

BACKGROUND: The outcomes of acute coronary syndrome patients are significantly modified with the use of biomarkers to complement standard clinical assessment. This prospective validation of its prognostic relevance in STEMI was performed during a single-center randomized trial evaluating the relationship between aborted myocardial infarction (AbMI) and clinical outcomes, between these two reperfusion strategies has ever been performed. Accordingly, we provide the first prospective validation of its prognostic relevance in STEMI.

METHODS: The outcomes of acute coronary syndrome patients are significantly modified with the use of biomarkers to complement standard clinical assessment. This prospective validation of its prognostic relevance in STEMI was performed during a single-center randomized trial evaluating the relationship between aborted myocardial infarction (AbMI) and clinical outcomes, between these two reperfusion strategies has ever been performed. Accordingly, we provide the first prospective validation of its prognostic relevance in STEMI.

RESULTS: Among patients with STEMI who were randomised to either a PCI or AbMI treatment, ST-elevation resolution in the single worst lead at baseline (PI) or ≥50% (90% CI 1.1) of patient assessments in the emergency department (ED), were discovered to have noncardiac causes for their symptoms.2,4

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BACKGROUND
Patients with nonvalvular atrial fibrillation (NVAF) are at increased risk for adverse events after noncardiac surgery. The Revised Cardiac Index (RCI) is currently used to predict perioperative risk. However, the prognostic accuracy of existing risk scores (CHADS2, CHA2DS2-VASc, and R2CHADS2) has not been evaluated in patients undergoing noncardiac surgery.

METHODS
Using a population-based data set of NVAF patients (n = 22,353) who underwent major or minor noncardiac surgery between April 1, 1999, and November 30, 2009, in Alberta, Canada, we examined the prognostic performance of previously validated risk scores of NVAF patients undergoing major (≥5 American Society of Anesthesiologists [ASA] score) and minor (<5 ASA score) noncardiac surgery. We compared the performance of the CHADS2, CHA2DS2-VASc, and R2CHADS2 scores against three key clinical outcomes: the Revised Cardiac Index (RCI), mortality, stroke, and thromboembolic events.

RESULTS
The CHADS2, CHA2DS2-VASc, and R2CHADS2 scores all improved for prediction of major perioperative events in patients undergoing noncardiac surgery; however, the R2CHADS2 score was significantly better than the CHADS2, CHA2DS2-VASc, and R2CHADS2 scores for risk prediction of perioperative death (AUC = 0.73, 0.82, and 0.84, respectively, at 5% risk cutoff).

CONCLUSIONS
In NVAF patients undergoing noncardiac surgery, the CHADS2, CHA2DS2-VASc, and R2CHADS2 scores all improved for prediction of major perioperative events, indicating that the R2CHADS2 score may be a better risk score for perioperative risk prediction in this patient population (Fig. 1).
MORTALITY OUTCOMES AMONG STATUS ABORIGINALS AND WHITES WITH HEART FAILURE

In this analysis of patients in Alberta with heart failure, cardiology trainee Kristin Lyons, CVC Beisatiasanias and three CVC faculty (Kaul, Ezekowitz and McAlister) collaborated to explore the similarities and differences of Aboriginal and non-Aboriginal patients. Not surprising to clinicians who may be familiar with in-hospital care of patients with heart failure, the Aboriginal patients were younger (by full and half years) and had higher rates of diabetes than their counterpart non-Aboriginal patients with heart failure. Importantly, this younger aged cohort of Aboriginal patients had a higher risk of mortality over the next one and five years— even after adjusting for the increased healthcare resource use, access to care and other clinical variables. This analysis draws out the importance of ensuring equitable access and quality of care to those most vulnerable to poor health outcomes.

Heart failure (HF) is a common condition with a lifetime risk of 20% no insulins, 2-4 years. It is associated with significant morbidity and mortality and is the leading cause of hospitalizations for people over 65 years of age. The high mortality of HF is a direct consequence of hospitalizations in Canada, one of the 2C2 WMC, Edmonton, Alberta T6G 2B7, Canada.

Will Liu, MSc, F. Alley A. McAlister, MD, MSc, PhD* 1*Department of Cardiology, Department of Medicine, University of Alberta, Edmonton, Alberta, Canada 2Mazankowski Alberta Heart Institute, University of Alberta, Edmonton, Alberta, Canada 3Canadian NICEF (C-CV) Coordinating, University of Alberta, Edmonton, Alberta, Canada 4St. Paul’s Hospital, Vancouver, BC, Canada 5Institute of Clinical Evaluation and Advisory, University of British Columbia, Vancouver, BC, Canada

**Canadian Journal of Cardiology 30 (2014) 626-631**

**GUIDE-IT trial, and the CIHR-sponsored SODIUM-HF trial.**

**THE RELATIONSHIP BETWEEN LEFT VENTRICULAR EJECTION FRACTION AND MORTALITY IN PATIENTS WITH ACUTE HEART FAILURE: INSIGHTS FROM THE ASCEND-HF TRIAL**

Randomized clinical trials often have more data beyond the primary hypothesis that is tested in the main trial. In the case of the global mega-trial in acute heart failure, ASCEND-HF, we have asked and answered many questions (~20 manuscripts and counting). In this analysis, Mustafa Toma, a former cardiology trainee at the University of Alberta and now faculty and staff cardiologist at UBC/St. Paul’s Hospital in Vancouver, B.C., evaluated the relationship between ejection fraction and clinical outcomes. Two critically important findings were identified: first, after adjustment for key patient information, there is little additional difference in risk if the ejection fraction is near or well above 35%; however, if the ejection fraction is <35%, the risk for death increases as the ejection declines. Risk stratification is never simple in patients with heart failure, so this does highlight that differences exist even within a group of patients with a "low EF". Mustafa has also continued his academic involvement in the HF trials arena—now as an investigator at St. Paul’s Hospital as part of these trials CVC is leading. BLAST-AHF, the NIH sponsored GUIDE-IT trial, and the CHF-sponsor SODIUM-HF trial.
Publications

**Authors**


**Title**

High sensitivity C-reactive protein in acute heart failure: insights from the ASCEND-HF trial.

**Journal**


Armstrong PW, Van de Werf FV.

**Title**

No STEMI left behind (invited editorial re 2013 STEMI consensus strategy in Acute Coronary Syndromes: the TIMACS study).

**Journal**


Bagai A, Schufler PJ, Granger CB, Mahaffey KK, Christenson RH, Bu B, Gopals R, Green CL, Joffe AM, Armstrong PW, Roe MT.

**Title**


**Journal**


**Title**

Routine invasive management early after fibrinolysis: Relationship between baseline risk and treatment effects in a pooled patient-level analysis of seven randomized controlled trials.

**Journal**


Bainey KR, Armstrong PW; Foranow GC, Cannon CP, Hernandez AF, Peterson ED, Peacock WF, Laskey WK, Zhao X, Schwamm LH, Bhatt DL.

**Title**

Use of non-intrangiotom system blockers in acute coronary syndrome: findings from Got With The Guidelines:Coronary Artery Disease Program.

**Journal**


Bainey KR, Armstrong PW.

**Title**

Clinical perspectives on reperfusion injury in acute myocardial infarction.

**Journal**


**Title**

Impact of reperfusion strategy on aborted myocardial infarction: insights from a large Canadian ST-Elevation Myocardial Infarction Clinical Registry.

**Journal**


**Title**

The cost implications of an early versus delayed invasive strategy in Acute Coronary Syndromes: the TIMACS study.

**Journal**


Bainey KR, Mehta SR, Lai T, Walsh RC.

**Title**

Complete vs culprit-only revascularization for patients with multivessel disease undergoing primary percutaneous coronary intervention: a systematic review and meta-analysis.

**Journal**

Am Heart J. 2014;167:141-142.

Bakal JA, McAlister FA, Liu W, Ezekowitz JA.

**Title**

Heart failure re-admission: measuring the ever-shrinking gap between repeat heart failure hospitalizations.

**Journal**


Bao MH, Armstrong PW, Zhang Y, Westerhout CM, Shiha, Walsh RC.

**Title**

The prognostic relationship of QT interval dispersion in patients with acute ST elevation myocardial infarction.

**Journal**


**Title**

Prognostic implications of quantitative evaluation of baseline Q-wave width in ST-segment elevation myocardial infarction.

**Journal**


**Title**

Large streamlined trials in cardiovascular disease.

**Journal**


**Title**

Dietary fatty acids intake and mortality in patients with heart failure.

**Journal**


Das D, Bakal JA, Westerhout CM, Hernandez AF, O'Connor CM, Atar D, McMurray JJ, Armstrong PW, Ezekowitz JA.

**Title**

The association between meteorological events and acute heart failure: New insights from ASCEND-HF.

**Journal**

ATL J Cardiol. 2014;177:89-92.


**Title**

An assessment of ST-segment measurement variability between two core electrocardiogram laboratories.

**Journal**


**Title**

Aborted myocardial infarction in ST-elevation myocardial infarction: insights from the PROACT-3.

**Journal**

Heart. 2014;100:1543-1549.


**Title**

The Alberta Heart Failure Etiology and Analysis Research Team (HEART) study.

**Journal**


**Title**


**Title**

Providing Rapid Out of Hospital Acute Cardiovascular Treatment 3 (PROACT-3).

**Journal**

Can J Cardiol. 2014;30:1208-1215.


**Title**

Randomized and design of the GUST-T study: Guiding Evidence Based Therapy Using Biomarker Intensified Treatment in Heart Failure.

**Journal**


**Title**

Improved increase of guideline-recommended oral antplatelet therapy: insights from the Canadian acute coronary syndrome reflective.

**Journal**

WHERE IS THE WISDOM
WE HAVE LOST IN KNOWLEDGE?

WHERE IS THE KNOWLEDGE
WE HAVE LOST IN INFORMATION?

—T.S. ELIOT
Trainees: The Next Generation of Health Researchers

ELOISA COLIN RAMIREZ
Postdoctoral Fellow

Please tell us a little about your research and how has your mentorship been valuable to you?

I began to collaborate with the CVC as a Postdoctoral Fellow in February 2012 as part of the research team working on the SODIUM-HF trial, under the supervision of Dr. Justin Ezekowitz. The SODIUM-HF study is a randomized controlled trial on sodium restriction in patients with chronic heart failure (HF). Sodium restriction has been broadly recommended as part of the self-care strategies in heart failure yet is based on little high-quality evidence. The pilot SODIUM-HF trial evaluated the effects of sodium restriction in 38 patients with chronic HF; 19 patients were prescribed a low sodium containing diet (1000 mg/day) and 19 a moderate sodium containing diet (2300 mg/day). Results of this pilot were recently published in the American Heart Journal. Currently, the SODIUM-HF trial is being conducted. This ongoing multicenter trial is expected to provide definitive results on the effects of sodium restriction in HF patients and develop evidence-based guidelines for sodium restriction in this patient population.

How would you describe your experience working with the CVC faculty, and how has their mentorship been valuable to you?

Unquestionably, CVC is a place to learn from internationally recognized leaders in clinical research. Dr. Ezekowitz was a terrific supervisor who put all his effort into creating a learning environment based on respect and trust. He always provided support, guidance and motivation when things seemed to be unclear and I started to lose perspective. I also had the opportunity to work with Drs. Armstrong and McAlister, whose ability to share their knowledge and provide significant and positive feedback encouraged learning and academic growth. Without any hesitation, this has been a life changing experience. I feel so fortunate to have been given the opportunity to be part of this team.

RABIA KASHUR
MSc Student, Medicine

Please tell us a little about your research and how has your mentorship been valuable to you?

I am currently a master’s student with Dr. Robert Walsh. My thesis project is about examining ethics issues of Cardiology research in ACS trials. Also as part of the many opportunities offered by the CVC to its trainees, I am involved in the PROACT-3 ECG substudy where we are analysing ECGs and in-hospital ECG data and trying to identify the correlation between those dynamic changes and adjudicated diagnoses, cardiac biomarkers, timing intervals from symptoms onset and study endpoints. The study’s objective is to recognize key variables in ECGs in conjunction with cardiac biomarkers to help triage patients with symptoms suspecting acute cardiovascular disease and identify high risk groups among them.

How would you describe your experience working with the CVC faculty, and how has their mentorship been valuable to you?

It’s a pleasure and a great opportunity to be part of the CVC, where you receive support with unlimited resources, and can collaborate within a close-knit team from diverse professional backgrounds. Working with the CVC faculty under their mentorship feels like having a storm of ideas but you don’t know which one to pursue. Once the ideas are presented, you are steered to find the proper way. I consider myself among the luckiest to work under the mentorship of prominent stars in the field of ACS and heart failure. They have taught me to challenge my abilities and have encouraged me to strive to the best of my capacity and true potential.

NARIMAN SEPEHRVAND
PhD Candidate, Experimental Medicine

Please tell us a little about your research and how has your mentorship been valuable to you?

Like all other CVC members, I am working on research projects related to cardiovascular diseases. I had the chance to work on the data we had at the CVC from the IBROMACT-3 trial which was the first trial to study the efficacy of pre-hospital biomarker testing in CV diseases. Receiving great mentorship from Dr. Ezekowitz and Dr. Armstrong, in collaboration with the CVC biostatistical team, we have succeeded in accomplishing a sub-study addressing the issue of the comparison between the performance of site versus adjudication committee in clinical trials. We have developed two potential population based projects which use administrative health data to answering specific cardiovascular health-related questions. Besides the above-mentioned studies, we have determined a couple of study questions to address as different parts of my PhD thesis which is about the diagnosis and management of patients with acute heart failure. These studies will cover a broad range of study designs from observational studies to clinical trials, from primary research to secondary researches (e.g. systematic review and meta-analysis).

How would you describe your experience working with the CVC faculty, and how has their mentorship been valuable to you?

The training I have received at the CVC about current cardiology research is really priceless. All of the CVC faculty are internationally known experts, and it is great to have the chance to learn from their experiences in research, clinical practice and health policy issues. Their solid history of mentoring students facilitates the learning process for the trainee.

During 2014, I received wonderful mentorship from Dr. Ezekowitz. His commitment to making a difference in the field of medicine is very prominent. I learned a lot from him about which questions are worthwhile, and how to seek through potential research projects for those that are not.
feedback is the fuel that drives my research. my progress. Their continuous support and experience and support is at the core of my mentors from the CVC; their knowledge, always very supportive. I'm very thankful to knowledgeable, humble, understanding and came I felt very welcomed. They are very valuable to you? faculty, and how has their mentorship experience working with the CVC admissions to CCU or hospital ward beds. The purpose of our study is to develop a point-of-care clinical prediction model to reduce unnecessary CCU admissions and of emergency department triage may help of acute heart failure; basically considering whether we are making the most of our data; how best to analyse and present the data, or increase statistical efficiency. How would you describe your experience working with the CVC faculty, and how has their mentorship been valuable to you? [To describe their mentorship as] valuable is an understatement. The questions I investigate are posed by my supervisor, Dr. Ezekowitz, and along the way my thinking is constantly calibrated and kept in check by our discussions. Thus I am brought up to speed (with what seems an endless literature) and can contribute far sooner than I otherwise could. There is always another interesting study waiting for me; I have the sense that I could never tire of the work. How would you describe your experience working with the CVC faculty, and how has their mentorship been valuable to you? It has opened the doors to a worldwide network of researchers, collaborators, and future colleagues. My supervisor Dr. Justin Ezekowitz is a wonderful mentor. He is always accessible, whether for a few minutes conversation or a two hour discussion. He has provided me with excellent connections globally, phenomenal advice, and superb clinical and research advice. 2014 Highlights: 3rd place at the Canadian Cardiovascular Society-Bayer Resident Vascular Award at CCS 2014. How would you describe your experience working with the CVC faculty, and how has their mentorship been valuable to you? Three years ago Dr. Ezekowitz provided me with my first opportunity to gain some research experience. That same summer, more than half my classmates also did some sort of research but our experiences could not have been more different. Medical students often feel like research is a chore, an application box ticking exercise. My experience was quite the opposite. Rather I became excited by the prospect of asking new questions and figuring out how to find the answers to those questions. Dr. Ezekowitz played a big role in this. Rather than handing me the answers, he helped me figure them out myself. Instead of giving me tasks, he pointed me in the general direction and gave me guidance. In short, without his mentorship, I do not think I would have developed such a great interest in research. How would you describe your experience working with the CVC faculty, and how has their mentorship been valuable to you? It has opened the doors to a worldwide network of researchers, collaborators, and future colleagues. My supervisor Dr. Justin Ezekowitz is a wonderful mentor. He is always accessible, whether for a few minutes conversation or a two hour discussion. He has provided me with excellent connections globally, phenomenal advice, and superb clinical and research advice. 2014 Highlights: 3rd place at the Canadian Cardiovascular Society-Bayer Resident Vascular Award at CCS 2014.
As both an academic research organization and a university centre, the CViC is committed to providing excellent mentorship opportunities to the next generation of health researchers and professionals. In the sections that follow, Ezekowitz and Goodman provide some insights into the importance of mentoring.

**How is mentoring involved in your research and career?**

**Justin Ezekowitz:** Simply put: I would not have been successful without mentorship. For me, mentorship has been more than career advice. I received the highest quality mentoring that one can receive. It has had an impact on my research by direct feedback as well as connected me internally and externally with my collaborators with whom I currently work. I have projects where I have expanded my opportunities because of the mentorship I received, which has forced me to think carefully about the science that I am conducting. I had the opportunity to work in a research team and learn how to instruct others and be instructed as well. Being aware of my limitations as well as my strengths within the research environment makes me a better researcher as well as a better physician. Additionally, learning how to focus on the project while remaining nimble and innovative, and being open to criticism as well as defending my work has of course led to better manuscripts, projects and grants.

**Shaun Goodman:** The role model aspect of working with Paul Armstrong and some of my other mentors has been particularly important. Watching them in action, specifically in terms of how they conduct themselves, interact with research staff, and seeing how hard they work is a constant reminder that the time, energy, and wisdom they are investing in you is not necessarily intended to be returned to the mentor, but to be paid forward to the next generation. It is critical to see action on the investment they make and the obligation you have to give back. You also have a responsibility to stop up the pipeline and ensure you follow through on the things they have enhanced or facilitated for you.

**Paul Armstrong:** The quote that sticks with me is from Alfred, Lord Tennyson’s Ulysses: “I am a part of all that I have met.” As I reflect on my mentors and how they inspired me to shoot for the stars and do things I didn’t even think I was even capable of, I think of how their inspiration was transformative. You learn things from watching someone’s footsteps that are not teachable or learnable in any other way. I remember it as though it were yesterday, for the first time telling a young woman she was now a widow. My mentors in those early days of being a physician demonstrated how to deal with these tragedies and interact with human beings. They also taught me how to evaluate patients, how to do a cardiac catheterization, how to present, how to write, how to ask for help when you are out of your depth, and to recognize someone is there to help you out. You also learn different things from different people. Warren Haefmmerle taught me skills nobody else could with cardiac catheterization for instance. I can remember it was yesterday at Massachusetts General Hospital: trying to cross an aortic valve ring guide and I could not do it and asked for his help. He came into the case and said “Paul, listen to the music of the catheter – tap, tap, tap, and think about putting a pencil through a straw.” That was in 1969 and I have never forgotten it.

**Shaun Goodman:** In the context of the mentor-mentee relationship you hopefully see that it is about both give and take. As a mentor you can see when the experience has been helpful or rewarding to the mentor. Being a mentor is about giving back but also seeing the value and the reward of influencing another human being and helping them to be not only a better physician but a better person. A big piece for me is the connections that could not be made for me to become a researcher and then having my own independent relationships, it is important for me to now be able to provide those connections to others. This is about personally giving back, but also recognizing that I am in a fantastic position to facilitate and enhance the experience of the next generation. I want people to have the experience I had and to load the next generation of clinical trials.

**Justin Ezekowitz:** I have been very lucky with my mentors as I have been in clinical medicine and research. Over the years, my mentors have provided me with the tremendous opportunity to grow as a person as well as a clinician scientist. My success in a large way is due to my mentors and specifically the mentor-mentee relationship that developed. It is clear to me that this is an important feature for training the next generation of clinician scientists and for me this is an important goal. I’ve had the opportunity to work with some of the ‘mentors of the mentors’ and recognize the importance of lifelong mentoring. Mentorship should start early and continue, perhaps never stop. This has inspired me to ensure I continue the tradition of ensuring high quality mentorship, and also reminded me of all that has benefit from continued mentorship, be it formal or informal.

**Paul Armstrong:** Shaun’s comment reminded me of something we do as mentors: we write letters of support, we make phone calls on their behalf, and we act on behalf of young people who show promise and are trying to establish their careers. We do this because we experienced this process first hand and being an advocate for the next generation is critically important. I remember walking into an interview at Massachusetts General Hospital Harvard Medical School with Charlie Sanders, the Director of the Cath Lab, who had worked with one of my mentor’s Peter Morrin from Queen’s University. In the interview he said to me: “If Peter Morrin says you’re a good man, you’re a good man.” I was given a job offer and this was because someone made a phone call.

There was a young man I mentored who after a summer working at John Hopkins Hospital came by my office to visit and say thank you. I was fairly young in my career at that point and to have someone come back and say thank you was very meaningful to me. None of us say thank you enough – we all try, but often forget.

Since we have grown up in an academic environment, we are constantly in a position to teach, there are always younger people behind us and, the teaching piece is an important aspect of mentoring. It comes down to the fact that it is our responsibility to pass on our knowledge and give back to the youth.

There comes a time for all of us when we feel a vicarious joy for the success of those we mentor: it was Wilco Runt, a real giant in Cardiology, who once said to me: “Always remember when your young people are in the sunshine you should be in the shadows.”

**Shaun Goodman:** If you are considering as a potential mentor, the criteria are not easy quantified in a numeric sense. The characteristics to look for in a mentor are often those things you would look for in a colleague or a teacher. The classical teaching is that one should look for someone who will be a friend, an advisor, a teacher and a role model so those are the key features. The key attributes of anybody who will be a mentor are that of mutual respect, trustworthiness, accessibility, and their level of accomplishment. Simply put, a long list of grants and publications is a good starting point, but mentors are more than the parts of CV. Prior successful mentorship is also helpful – a prior mentor’s success will often predict future mentor-mentor success.

**Justin Ezekowitz:** It is a delicate balance that is both an evolution and work in progress. For instance, in the beginning there needs to be an alignment in terms of goals and objectives. Later, after challenging the mentee to decide upon their direction and goals and giving them the assistance they need to move in the right direction, the best mentors allow their mentees to develop their own agendas. At the end of the day a successful mentor must be comfortable in allowing the mentee to act independently and make their own decisions. It is similar to a relationship between a parent and child in the sense that you have invested in them, given them skills, shared your expertise and wisdom, and then following a period of time they need to be able to choose their own direction and you need to be able to step back, which indirectly is actually support for the individual.

**Paul Armstrong:** Personal integrity and a relationship of trust are both critical, especially when the mentee is in an evaluative or formative stage of their research. The sense that the information and knowledge you share will be kept in confidence I think is a key element.

The best mentors understand who you are as a person as well as where you are in your career and what you want to do - this balance which is different for all of us and changes over time is critically important. There is never a lack of need for mentoring. I’ve always had opportunities to help others who could talk about opportunities I have been given and their opinions and experiences. In that way, I think mentoring is a lifelong process that has different requirements at different stages.

**WHAT ARE THE CRITERIA FOR CONSIDERING AS A POTENTIAL MENTOR?**

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In October 2014, CVC hosted our 20th anniversary of the New Concepts in Acute Coronary Syndromes: Beyond 2000, held in Vancouver, BC in conjunction with the Canadian Cardiovascular Congress and supported by an unrestricted educational grant from AstraZeneca. As has been our tradition with this symposium, we were pleased to have partnered with the Mazankowski Alberta Heart Institute and the University of Alberta in undertaking this venture which probes new avenues in acute coronary syndromes and also address the role of novel technologies amidst the brave new information age in which we work.

This year’s program addressed highlights from the past year to emphasize the challenges but openly bring forth solutions. With a 100% response rate on the 75-question survey distributed prior to the colloquium, we were able to ascertain meaningful information from 46 of our investigative sites. The key findings included sharing the June 2014 issue of our Canadian Cardiac Chronicle and detailed report cards were also provided to all sites who participated in the survey. The primary impediments to quick start up surrounded contracts and ethics reviews, however, it was interesting to see that while the average time to start-up was two to six months, many of the sites had broken the barrier and were able to produce a quick start-up in under two months. We saw a similar result with time to enrollment following activation where the average was two to four weeks but most sites had shown that their quickest recruitment post activation was done in under two weeks. As noted previously, additional highlights are available in the June 2014 issue of the Canadian Cardiac Chronicle.

Seeking out more efficient ways to run clinical trials in Canada, in late 2013 we commenced planning for the first annual CVC Clinical Trials Research Colloquium held in Banff, AB on March 9, 2014 in conjunction with the ACC Rockies Meeting. The intent of this meeting was to bring together 10–12 key Canadian sites, have them complete a detailed survey on all aspects of clinical trials at their site and then bring them together in Banff where we could look at the compiled data from the survey and discuss strategies to enhance start-up and overall efficiencies of clinical trials in Canada.

The interactive session which included 11 investigators and 10 study coordinators representing 13 sites from across the country along with sponsor and ARO representation provided a unique opportunity for open discussion around the many challenges facing clinical trials in Canada, including cost of doing research, impediments to start-up, contract issues and the future of clinical research in Canada. This open discussion not only presented the opportunity to express the challenges but openly bring forth solutions. With a 100% response rate on the 75-question survey distributed prior to the colloquium, we were able to ascertain meaningful information from 46 of our investigative sites. The key findings included sharing the June 2014 issue of our Canadian Cardiac Chronicle and detailed report cards were also provided to all sites who participated in the survey. The primary impediments to quick start up surrounded contracts and ethics reviews, however, it was interesting to see that while the average time to start-up was two to six months, many of the sites had broken the barrier and were able to produce a quick start up in under two months. We saw a similar result with time to enrollment following activation where the average was two to four weeks but most sites had shown that their quickest recruitment post activation was done in under two weeks. As noted previously, additional highlights are available in the June 2014 issue of the Canadian Cardiac Chronicle.

To ensure the high quality presentations and video dialogues with key speakers is preserved from this legacy event, we have established a web site: www.Beyond2000.org that is now available for your viewing under the “Continuing Conversation” banner.
In 2014, the faculty of the CVC had the privilege of hosting five outstanding, internationally renowned academics continuing a program generously sponsored by an unrestricted educational grant from Amgen. Inc.

These visits are a highlight of our CVC academic year and allow for one-on-one faculty time and teaching of our cardiology and research trainees. They provide a welcome window on the global state of cardiovascular medicine as it relates to career choices for trainees and potential future directions for meaningful research. They constitute a seminal part of our educational/research mission.

**Distinguished Visitors**

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**DR. G. MICHAEL FELKER**
Associate Professor Division of Cardiology, Chief Heart Failure Section at Duke University School of Medicine
Director of the Heart Center Clinical Research Unit and Director of Heart Failure Research, Duke Clinical Research Institute

**March 12, 2014**
- Cardiology Divisional Rounds: “New Therapies for Acute Heart Failure”
- Research Rounds: “Biomarker Guided Therapy for Heart Failure”

Michael Felker gave us the key information on why biomarker trials succeed or fail, and how this is intimately related to the biomarker being tested as well as the patient population selected and clinical trial design.

He ‘guided’ us through the design of his collaborative project (GUIDE-IT) that involves CVC as a Canadian lead for the National Institutes of Health funded research project. His insightful CCU rounds also provided for an excellent training experience for our cardiology trainees, which will continue through our CVC-DCRI collaborative training environment.

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**DR. ROBERT HARRINGTON**
Interventional Cardiologist
Professor of Medicine
Chairman of the Department of Medicine, Stanford University

**April 16, 2014**
- Cardiology Divisional Rounds: “The Evolution of How We Think about NSTEMI ACS: From Rule Out MI to Acute Coronary Syndrome”

Robert Harrington provided his perspective not only on the future of cardiovascular clinical trials but also presented on our own research in progress and potential directions for future collaborations. Dr. Harrington – previously Director of the Duke Clinical Research Institute- moved to Stanford University in 2012 and was subsequently joined by Ken Mahaffey from DCRI. Together they are aiming to develop clinical research and we have worked towards a new academic research collaboration facilitating both North/South and East/West connectivity. This exciting opportunity will unquestionably enrich our opportunities, capacity and creativity as the clinical research agenda environment evolves in the times ahead.

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**DR. MICHAEL E. FARROUHI**
Professor of Medicine, University of Toronto
Peter Munk Chair in Multinational Clinical Trials, University Health Network Director, Heart & Stroke Richard Lewar Centre of Excellence, University of Toronto

**October 29, 2014**
- Cardiology Divisional Rounds: “Medical and Revascularization Strategies in Diabetic Patients with Coronary Artery Disease”
- Research Rounds: “The TAILOR-PCI Trial - Clinical Implementation of Clopoxidogel Pharmacogenetics”

Michael Farouhi’s presentation during the Cardiology Divisional Rounds provided an instructive overview on the role of medical treatment and revascularization strategies in diabetic patients with coronary artery disease informed by his leadership in the FREEDOM trial. In his research rounds he presented novel work relating to clinical implementation of clopoxidogel pharmacogenetics. New opportunities for east-west collaboration emerged from this visit and are being facilitated by CVC Co-Director Shaun Goodman.

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**DR. ADRIAAN VOORS**
Professor of Cardiology
Director of the Heart Clinic and Director of the Department of Echocardiography
University Medical Center Groningen, Groningen, Netherlands

**November 19, 2014**
- Cardiology Divisional Rounds: “Diatopic response and renal function in patients hospitalized for Acute Heart Failure”
- Research Rounds: “Individualized responses to chronic heart failure treatment”

Adrian Voors, leading expert in biomarkers, heart failure and lead investigator of acute HF trials, reminded us about the importance of the clinical evaluation and how it plays a role even in the clinical trial environment. The research rounds explored the massive wealth of data – ‘omics particularly – that is soon to play a role in HF. He laid the groundwork for future exchange for trainees, introduced new ideas that are already underway and also increase collaboration between Europe and Canada and specifically the Netherlands.

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**DR. ROXANA MEHRAN**
Professor of Medicine (Cardiology) and Health Evidence and Policy
Director of Interventional Cardiovascular Research and Clinical Trials
The Mario-José and Henry R. Kravis Center for Cardiovascular Health, Icahn School of Medicine at Mount Sinai

**December 9 & 10, 2014**
- Research Rounds: “Clinical Research in Crisis: What is the future?”
- Cardiology Divisional Rounds: “DAPT Duration after stenting: is Shorter better or is Longer safer?”

Roxana Mehran provided insights into the contemporary challenges of clinical research and the current thinking around the vexing challenges of optimal duration of dual antiplatelet therapy after coronary stenting. Dr Mehran is an outstanding role model, heart failure and lead investigator of acute HF trials, reminded us about the importance of the clinical evaluation and how it plays a role even in the clinical trial environment. The research rounds explored the massive wealth of data – ‘omics particularly – that is soon to play a role in HF. He laid the groundwork for future exchange for trainees, introduced new ideas that are already underway and also increase collaboration between Europe and Canada and specifically the Netherlands.

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**“MORE THAN MANY AREAS OF SCIENCE, CLINICAL RESEARCH REQUIRES A TEAM OF COLLABORATORS TO BE ABLE TO SUCCESSFULLY ASK AND ANSWER QUESTIONS. OVER THE LAST TWENTY-FIVE YEARS, I HAVE BEEN VERY FORTUNATE TO HAVE A RESEARCH RELATIONSHIP AND PERSONAL FRIENDSHIPS WITH THE INVESTIGATORS AND STAFF OF CVC.”**

**WHEN I SERVED AS DCRI DIRECTOR FROM 2006-2010, I CONSIDER NO COLLABORATIVE RELATIONSHIP MORE VALUED THAN THE ONE BETWEEN DCRI AND CVC. IN MANY WAYS, IT WAS AKIN TO THE “SPECIAL RELATIONSHIP” DESCRIBED BETWEEN THE US AND THE UK, A RELATIONSHIP BORNE OF A COMMON SET OF BELIEFS AND VALUES. SINCE MOVING TO STANFORD, I SEE THE TREMENDOUS POSSIBILITIES IN EXTENDING THAT DCRI-CVC COLLABORATION TO OUR CAMPUS HERE IN PALO ALTO. ON A MORE PERSONAL LEVEL, I HAVE NO WISER FRIEND, COLLEAGUE AND MENTOR THAN MY TRUSTED COLLABORATOR, PAUL ARMSTRONG.”**

— Robert Harrington
Arthur L. Bloomfield Professor of Medicine, Chair, Department of Medicine, Stanford University
For well over a decade, we have had an outstanding collaboration and master clinical research agreement with the Duke Clinical Research Institute (DCRI). This partnership has facilitated the development of a strong academic thought leadership, focused on the enhancement of patient care and health care systems through the generation, translation and dissemination of new knowledge. This partnering has facilitated the sharing of clinical trial data and the incorporation of innovative high quality research across the full investigative spectrum. It has also provided training and mentoring of young clinician scientists, many of whom have trained at the DCRI and then returned to centres in Canada, including the University of Toronto, the University of Alberta, and elsewhere.

In March of 2014, we were delighted to host a visit from Eric Peterson, Director of the Duke Clinical Research Institute and Lisa Berdan, Director of Global Mega-Trials at Duke Clinical Research Institute. This was a pivotal opportunity to advance our ARO collaboration and review current and future joint projects. These colleagues then joined us at the Research Colloquium and ACC Rockies meeting. As part of the ACC Rockies Distinguished Professor program, Dr. Peterson provided an insightful presentation at the University of Alberta entitled “Cardiovascular Trials on Future Patient Care” highlighting the key role of research on clinical practice.

The Canadian Cardiac Chronicle

CVC is pleased to publish The Canadian Cardiac Chronicle, our newsletter that shares current trial information and upcoming projects that may be of interest to our site network.

The Chronicle also lists current publications by the CVC faculty, resulting from the projects and trials data we manage.

Posted on our website at www.vigour.ualberta.ca, the Chronicle is distributed to over 500 recipients, including our investigative sites, sponsors and international collaborators.
Crossing Borders

Reflecting the CVC's global reach and network of collaborators, this map highlights some of the key international lectures and presentations that were delivered by CVC faculty members in 2014. The CVC's insights and impact are enhanced by these pursuits of knowledge translation and dissemination.

**VANCOUVER, CANADA**
Paul Armstrong - Presentation: Data and safety monitoring boards for clinical trials. Opening the kimono. 2014 Margolese Prize, University of British Columbia, St Paul's Hospital - November 2014

**SEAN VAN DIENEN**
- 2014 Canadian Cardiovascular Congress - October 2014
- Optimal care of the post arrest patient revisited: the evolution of the therapeutic hypothermia and other contemporary technologies in the cardiac arrest management.
- Evolution of Critical Care Cardiology: What Lies Ahead

**TORONTO, CANADA**
Paul Armstrong - Key Note: ACS Update: Cardiovascular medicine 2014: Lessons learned and roads untraveled reflections from a clinician investigator. Cardiology for the Practitioner - Cardiology Day, St. Michael's Hospital - April 2014

**JUSTIN EZEKWOTZ**
Cardiology Rounds: Natriuretic Peptide-Guided Therapy: Fact, Finished or Future? St. Michael's Hospital - January 2014

**OTTAWA, CANADA**
Shaun Goodman - Is There Still A Role for Coronary Revascularization in Improving Outcomes in CAD in the Era of New Medicinal Therapies for ESCHEMA? - 17th International Toronto Ottawa Heart Summit - June 2014

**BROOKLYN, USA**
Paul Armstrong - ACC Co-Chair Special Session: Late Breaking Clinical Trials Deep Dive. The American College of Cardiology 63rd Annual Scientific Session - March 2014

**NEW YORK, USA**

**MONTREAL, CANADA**
**JUSTIN EZEKWOTZ**
- PRO: CRT should be recommended for patients with HF and Atrial Fibrillation. Canadian Heart Failure Society Heart Failure Update 2014 - May 2014

**OTTAWA, CANADA**
**PAUL ARMSTRONG**
- Invited Lecturership: ST elevation myocardial infarction 2014: Lessons learned and roads untraveled. Macdonald Lectureship, Queen’s University - June 2014

**BARCELONA, SPAIN**
2014 European Society of Cardiology Annual Congress - August 2014

**PAUL ARMSTRONG**
- Presentation: Pharmacoinvasive vs. primary PCI.

**JUSTIN EZEKWOTZ**

**SHAUN GOODMAN**
- Panel Discussion: New frontiers in cholesterol management in high CV risk patients
- Presentation: How might PCSK9 inhibition change this debate?

**BLOOMBERG, CANADA**
**KINGSTON, CANADA**
Paul Armstrong - Invited Lecturership ST elevation myocardial infarction 2014: Lessons learned and roads untraveled. Macdonald Lectureship, Queen’s University - June 2014

**NEW YORK, USA**
**ROBERT WELSH**
- Innovations in Cardiovascular Care: Tran-catheter Aortic Valve Implantation and From guidelines to practice: DAPT in ACS. St Vincents Hospital, Darlinghurst - May 2014

**SYDNEY, AUSTRALIA**
**ROBERT WELSH**
- Transcatheter Cardiovascular Therapeutics (TCT 2014) - September 2014
- Didactic Symposia: Clinical Trial Design and Interpretation, Part I
- Partnership Session: Montreal Live From guidelines to practice: DAPT in ACS. St Vincents Hospital, Darlinghurst
- Advances in Antithrombotic Therapy and the Clinical Implications of Recent Trials.
- Chairperson: Interventional Cardiology, Women in Innovations (SCAI)
- Presentation: Implementation the Fibroscan/Pharmacoinvasive Strategy for STEMI Patients Where Primary PCI is not Practical.
The Canadian VIGOUR Centre is recognized as a thought leader and valuable partner in cardiovascular research across all regions of Canada and amongst key centres around the world. Its track record of conducting, delivering and health outcomes is strongly influenced by clinical practice and health care.

**CVC SERVICES AND ACTIVITIES**

**POPULATION AND ECONOMIC HEALTH OUTCOMES RESEARCH**
- Collection of resource utilization and cost data
- Development of economic models
- Cost-effectiveness analyses
- Clinical Registry development

**BIOSTATISTICS**
- Design of research protocols and studies
- Development of statistical analysis plans and database specifications
- Data management
- Programming expertise in SAS and R
- Generation of statistical tables, figures, listings and interpretation of findings
- Consultation and execution of advanced statistical methods
- Development and application of novel statistical methods

**ECG CORE LAB**
- Informing trial design
- Monitoring protocol adherence
- Guiding mechanistic insights
- Prognosis and outcomes assessment

**CLINICAL TRIALS**
- Investigator selection, qualification and recruitment
- Investigative site start-up and training
- Ensuring site regulatory compliance
- Project site, data management
- In-house and onsite clinical monitoring (including bilingual services)

**THOUGHT LEADERSHIP**
- Provide expert advice and promotion of cardiovascular research characterized by quality, scholarship and integrity
- Defined unmet needs for patients with and those at risk of cardiovascular disease
- Align new cardiovascular research with these unmet needs
- Seek cost effective solutions and enhance return on investment in research
- Trial architecture, development, data acquisition, integration, analysis, presentation and peer-review publication
- Creation of novel sub studies aimed at mechanistically informing primary clinical trial results
- Mentoring junior faculty, medical trainees, students and allied health professionals

**CLINICAL REGISTRIES**
- Vital Heart Response (VHR) (R Welsh)
  - CQI
  - Regional Collaboration
  - Trials within registries e.g. PROACT
  - Model for others
- Acute Heart Failure (AHF) (J Ezekowitz)
  - CIHR: inquiry regarding outcomes/biomarkers
  - Novel Interventions/trials

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**ARO Services**

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**Knowledge which is unable to support action is not genuine -**

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**And how unsure is activity without understanding!**

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— RUDOLPH VIRCHOW
Clinical Trials

As a key component to our organization, the clinical trials we are involved in provide us with valuable data to help support and influence change within clinical practice and the care of patients. In 2014 we were involved in five Phase III studies, two Phase II studies, and three grant-funded studies. Initial planning and negotiations for additional projects are currently underway. With a network of over 200 sites across Canada, we had more than 130 investigators from our site network involved in at least one clinical trial this year. A total of 903 patients were enrolled in Canada from six recruiting trials this year and to date the sites working with us have enrolled a total of 20,490 Canadian patients, contributing to the 306,015 patients recruited globally from the 53 Phase II and III trials we have been involved in.

With close to 15 years of experience in clinical research and a background in cardiovascular nursing our Clinical Trials team continues to be led by Assistant Director of Clinical Trials, Tracy Temple. The highly dedicated and well-trained team with varying clinical research experience includes five in-house Clinical Trial Project Leads, two regulatory and site management support staff and one administrative support person. Based regionally across the country our monitoring team includes Lead Clinical Research Associate, Halina Nawrocki, a team of seven monitors and one report reviewer. In addition to our team being ICH/GCP trained, many also hold the CCRP designation with SoCRA or the CCRA designation with ACRP. Responsible for ensuring all operational aspects of the study run smoothly our Clinical Trial Project Leads and support staff work closely with our sites to strive for quick and efficient start up, high recruitment and retention of patients that meet the study criteria, data entry that is accurate and well maintained, and delivery on timelines as laid out from study start up to study completion. As the primary contact for the Canadian sites the Clinical Trial Project Leads have their pulse on all aspects of the trial which enables them to maintain a good understanding of the overall functioning of the study while closely monitoring trends and issues across Canada. Our Clinical Trial Project Leads maintain a close working relationship with the Canadian National Coordinator(s) and/or Operational Lead ensuring they are kept up to date on the operational aspects of the study in Canada and utilize their expertise and support throughout the study.

In addition to conducting source document verification, drug accountability and other required monitoring related tasks, the CVC monitors use their visits as a teaching opportunity to share lessons learned and ideas from other sites which is beneficial in their daily work as well as ensuring they are audit prepared. With an extensive background in monitoring and having been involved in many audits and inspections throughout her career with CVC, Halina Nawrocki has helped prepare many of our sites for their upcoming inspections as well as shared lessons learned with our team and sites. With the ongoing support and expertise of our project and monitoring team and well prepared sites, all CVC monitored sites who underwent inspections in 2014 received compliant ratings.

Overall our Clinical Trials team strives to build relationships with sites, sponsors and partners across Canada and globally, enhance efficiency in our processes, achieve the highest level of quality, and deliver a strong Canadian contribution in each clinical trial.
Clinical Trials

ODYSSEY OUTCOMES
Protocol #: 220/18,000
Sponsor: Sanofi-aventis Recherche & Développement
Drug: Alirocumab (SAR316805/REGN727)
Anticipated Timeline: June 2012 - March 2013
Trial Status: Actively enrolling

A randomized, double-blind, placebo-controlled, parallel-group study to evaluate the effect of Alirocumab (SAR316805/REGN727) on the occurrence of cardiovascular events in patients who have already recently experienced an acute coronary syndrome.

GUIDE-IT
Protocol #: 310/1,100
Sponsor: Duke Clinical Research Institute & Roche
Drug: N/A
Anticipated Timeline: December 2012 - June 2017
Trial Status: Actively enrolling

Determine the efficacy of a strategy of biomarker-guided therapy compared with usual care in high-risk patients with left ventricular systolic dysfunction.

IMPRESS-IT
Protocol #: PRO0033097
Sponsor: Merck & Co. Inc.
Drug: Vytorin
Anticipated Timeline: June 2012 - March 2013
Trial Status: Actively enrolling

A multicenter, double-blind, placebo-controlled, parallel-group study evaluation of the effect of Vytorin (ezetimibe/simvastatin Tablet) vs. simvastatin monotherapy in high-risk patients presenting with acute coronary syndrome.

IMPROVE IT
Protocol #: P0103
Sponsor: Merck & Co. Inc.
Drug: Vytorin
Anticipated Timeline: March 2003 - December 2014
Trial Status: Database locked and closing out sites

A multicenter, double-blind, randomized study to establish the clinical benefit and safety of Vytorin (ezetimibe/simvastatin Tablet) vs. simvastatin monotherapy in high-risk patients presenting with acute coronary syndrome.

IMPROVED REDUCTION OF OUTCOMES: VYTORIN Efficacy International Trial
Protocol #: 600/18,142 COMPLETED
Sponsor: Merck & Co. Inc.
Drug: Vytorin
Anticipated Timeline: March 2003 - December 2014
Trial Status: Patient enrollment achieved

500/18,000 (Canada (CVC)/Global)

Number of sites participating

REGULATE-PCI
Protocol #: REG1-CLIN10
Sponsor: Regado Biosciences Inc.
Drug: REG1 Anticoagulation System (pegnivacogin & anivamersen)
Anticipated Timeline: July 2013 - September 2016
Trial Status: Actively enrolling

A Phase 2b, multicenter, randomized, placebo-controlled, dose-ranging study to investigate the efficacy of a strategy of biomarker-guided therapy compared with usual care in high-risk patients presenting with acute coronary syndrome.

REGULATE-PCI
Protocol #: Pro00033097
Sponsor: Merck & Co. Inc.
Drug: Vytorin
Anticipated Timeline: June 2012 - March 2013
Trial Status: Actively enrolling

A multicenter, double-blind, placebo-controlled, parallel-group study to evaluate the effect of Vytorin (ezetimibe/simvastatin Tablet) vs. simvastatin monotherapy in high-risk patients presenting with acute coronary syndrome.

PROACT
Protocol #: N/A
Sponsor: University Hospital Foundation & Mazankowski Alberta Heart Institute
Drug: N/A
Anticipated Timeline: October 2011 - January 2016
Trial Status: Closed early

Randomized, open-label, multi-center, active-controlled, parallel group study to determine the efficacy and safety of the REG1 Anticoagulation System Compared to Bivalirudin in Patients Undergoing Percutaneous Coronary Intervention.

PROACT
Protocol #: N/A
Sponsor: University Hospital Foundation & Mazankowski Alberta Heart Institute
Drug: N/A
Anticipated Timeline: October 2011 - January 2016
Trial Status: Closed early

Randomized, open-label, multi-center, active-controlled, parallel group study to determine the efficacy and safety of the REG1 Anticoagulation System Compared to Bivalirudin in Patients Undergoing Percutaneous Coronary Intervention.

PROACT
Protocol #: N/A
Sponsor: University Hospital Foundation & Mazankowski Alberta Heart Institute
Drug: N/A
Anticipated Timeline: October 2011 - January 2016
Trial Status: Closed early

Randomized, open-label, multi-center, active-controlled, parallel group study to determine the efficacy and safety of the REG1 Anticoagulation System Compared to Bivalirudin in Patients Undergoing Percutaneous Coronary Intervention.

PROACT
Protocol #: N/A
Sponsor: University Hospital Foundation & Mazankowski Alberta Heart Institute
Drug: N/A
Anticipated Timeline: October 2011 - January 2016
Trial Status: Closed early

Randomized, open-label, multi-center, active-controlled, parallel group study to determine the efficacy and safety of the REG1 Anticoagulation System Compared to Bivalirudin in Patients Undergoing Percutaneous Coronary Intervention.

SODIUM-HF
Protocol #: M0030275
Sponsor: CIHR grant
Drug: N/A
Anticipated Timeline: December 2013 - December 2017
Trial Status: Actively enrolling

Multicenter clinical trial in ambulatory patients with chronic HF to evaluate the efficacy of a low sodium containing diet on a composite clinical outcome composed of all-cause mortality, cardiovascular hospitalizations and cardiovascular emergency department visits.
**TECOS**

**Trial Evaluating Cardiovascular Outcomes with Sitagliptin**

- Protocol #: 082-04
- Sponsor: Merck Sharp & Dohme Corp., a subsidiary of Merck & Co., Inc.
- Drug: Sitagliptin
- Anticipated Timeline: August 2008 - March 2015
- Trial Status: Enrollment complete, Patient visits complete, In closeout

Randomized, placebo controlled clinical trial to evaluate cardiovascular outcomes after treatment with sitagliptin in patients with Type 2 diabetes mellitus and inadequate glycemic control.

- **Patient enrollment target:** 401/14,000 (Canada/Global)
- **Patient enrollment achieved:** 549/14,745 COMPLETED (Canada/Global)
- **Number of sites participating:** 28/681 (Canada/Global)

**EXCEL**

**Exenatide Study of Cardiovascular Event Lowering**

- Protocol #: BCB109
- Sponsor: Amylin Pharmaceuticals, LLC a subsidiary of Bristol-Myers Squibb
  (Acquired by AstraZeneca in 2014.)
- Drug: Exenatide
- Anticipated Timeline: May 2009 - December 2017
- Trial Status: Actively enrolling

A randomized, placebo controlled clinical trial to evaluate cardiovascular outcomes after treatment with exenatide once weekly in patients with type 2 diabetes mellitus.

- **Patient enrollment target:** 500/14,000 (Canada/Global)
- **Patient enrollment achieved to date:** 488/12,889 (Canada/Global)
- **Number of sites participating:** 28/633 (Canada/Global)

The long-awaited results of the IMPROved Reduction of Outcomes: Vytorin Efficacy International Trial (IMPROVE-IT) arrived in Chicago at the American Heart Association meeting in November, 2014. Nine years after this important global randomized clinical trial started, the preliminary findings from 18,144 post-acute coronary syndrome patients had finally been presented from the Late Breaking Clinical Trials podium and were now in the public domain.

The Wall Street Journal headline described the addition of ezetimibe to simvastatin therapy as showing a “…modest benefit in reducing heart attacks…” However, the subtitle of the article more appropriately captured the spirit of this enormous undertaking by physicians, study coordinators, and academic research organizations: “Trial Marks a Milestone in Battle to Fight Cardiovascular Disease by Lowering Cholesterol”. Indeed, the IMPROVE-IT trial represents the first time that adding a non-statin lipid modifying agent to patients’ secondary prevention regimen not only resulted in even lower LDL cholesterol levels, but led to a significant reduction in subsequent cardiovascular events.

Canadian contribution to this trial was substantial—we were the third highest enrolling country (of 39) in the world with 1,106 patients from 64 sites! The IMPROVE-IT trial, consistent with the vision of the Canadian VIGOUR Centre (CVC) “…to generate, translate and disseminate knowledge on novel...therapeutics strategies in cardiovascular medicine acquired through collaborative research to enhance the health of the citizens of...Canada, and the world” embodied our core values of quality, collaboration, integrity, and respect. Indeed, one measure of the outstanding Canadian effort was the fact that only five patients (<1%) were lost to follow-up at sites collaborating with the CVC. This is a remarkably low rate in the context of a trial that identified >5,300 primary endpoints during almost 100,000 total patient years of follow-up.

The aforementioned outstanding Canadian participation and performance, together with the unique findings of benefit in the IMPROVE-IT study, are extremely encouraging. The CVC looks forward to continued collaboration with Canadian investigators and coordinators in ongoing and future studies aimed at translating these types of benefits realized in randomized clinical outcome trials and ultimately into routine clinical practice for our patients.
Active Principal Investigators

CVC has an extensive site network across Canada of principal investigators (PIs) who actively participate in CVC managed clinical drug trials, to meet patient enrollment targets. This map represents the locations of 133 principal investigators who were participating in nine (9) of the active clinical trials either coordinated by the CVC, or monitored by the CVC, in 2014. Nearly 50% of these sites have participated in more than one CVC managed clinical trial. In 2014, 322 visits were carried out at these sites by the CVC monitoring team, to ensure adherence to trial protocols and patient safety.
The aim of our ECG Core Laboratory is to translate research results into clinically relevant applications. Using the ECG—a venerable but powerful biomarker—we can generate an improved understanding of the pathophysiologic processes involved in acute cardiovascular syndromes (ACS), thereby enabling not only prediction of outcomes but also assessing effectiveness of treatment. These insights serve to further stimulate cardiovascular scientific research. Hence in 2014 one of our featured publications (Aborted Ml by Malecki et al) arose from the CVC ECG Core Laboratory.

Other key projects the ECG Core Lab is involved in include the Vital Heart Response (VHR) project and PROACT4 projects.

The Vital Heart Response (VHR) project led by Dr. Robert Welsh is a regional initiative that aims to implement timely evidence-based reperfusion strategies to maximize the outcome of patients with ST-segment elevation myocardial infarction (STEMI). The VHR project has enrolled 3,578 patients and the core lab has completed analysis of 1,992 patients (5,498 ECGs).

In 2014, the ECG Core Lab was involved in PROACT4, the fourth stage of the PROACT project. A key component of this project is timely recognition of acute cardiovascular patient presentations and how best to provide rapid early diagnosis and more efficient patient care. In 2014, 312 patients (405 ECGs) were analyzed and this data will be analyzed in concert with acute biomarkers from patients with acute chest pain as well as those with shortness of breath and presumed heart failure.

The ECG Core Lab at the CVC continued its mandate of conducting quality analyses using clinical research data in 2014. The core lab has accumulated a wealth of experience in its readers and continues to mentor and serve as valuable training ground for the next generation of talented researchers. To date ECGs from over 73,300 patients enrolled in studies around the world have been analyzed. This provides an excellent database for additional sub-studies, analyses and research.

The CVC houses databases from over 27 clinical trials, which provide a rich cache of patient characteristics, ECGs, treatment and outcomes. The CVC also has access to population based data for over 500,000 Albertan patients seeking cardiovascular medical care between the fiscal years 1999/2000 and 2009/2010 and Canadian Institute of Health Information data on over 4,400,000 cardiac-related acute care hospitalizations in Canada (not including Quebec), between the fiscal year 2002 and fiscal year 2013 as well as those participating in the following registries or studies:

- AHF-EM Retrospective Cohorts
- Alberta Heart Registry
- ASCEND-HF Registry
- PROACT Retrospective Cohorts
- Vital Heart Response Registry

The CVC Biostatistics group works with clinician investigators to conduct innovative clinical research in cardiovascular medicine in collaboration with local, national, and international researchers. This research focuses on the assessment of patient, environmental and process-of-care factors and their association with outcomes in patients with acute coronary syndromes (ACS), acute and chronic heart failure, cardiac arrest, arrhythmias, syncope and diabetes. Areas of interest include international and regional differences, incidence/prevalence and temporal trends, time to treatment, use of pharmacologic and mechanical interventions, resource allocation and utilization, and gender/sex and age differences in relation to clinical outcomes.

Services provided by CVC’s biostatistics team include data management, development of statistical analysis plans and database specifications, programming expertise in SAS and R, generation of statistical tables, figures and listings and interpretation of findings, and consultation and execution of advanced statistical methods.

In 2014, the Biostatistics group participated in numerous studies based on clinical trial or population-based data, utilizing a variety of statistical techniques. These ranged from survival analysis to a novel analysis of composite endpoints in ACS trials. The latter has garnered increased interest from various stakeholders and remains a key area of research. In keeping with the CVC mandate, members of the biostatistics team contribute to mentoring the next generation of cardiovascular researchers. They work closely with medical students, residents and other junior researchers to explain the statistical techniques used and their interpretation.
Population Health and Economic Outcomes

In the last decade over half a million Albertans have been diagnosed with heart disease, which accounts for the second highest number of deaths in the province annually. Ongoing technological advances in the treatment of acute coronary syndromes and heart failure make it essential to examine whether the use of these expensive drugs and devices is equitable and to assess their impact on current and future costs of cardiac care in Alberta.

The CVC Outcomes Group (led by Drs. Kaul, Ezekowitz and McAlister) has been actively involved in using health care administrative data to examine issues related to access, delivery, treatment, and outcomes of heart disease in Alberta and Canada. Administrative databases have become a cornerstone in the process of assessing performance and providing feedback to improve quality of health care delivery at a population level. Using administrative data received from Alberta Health and Wellness (AHW), the Canadian Institutes of Health Information (CIHI) and the Alberta Health Services Data Integration, Management and Reporting (DIMR) system, the CVC Outcomes group has developed integrated longitudinal databases linking inpatient, outpatient (including emergency department), physician office, pharmaceutical claims, registry, vital statistics and census data for all Alberta residents with heart failure, acute coronary syndromes, nonacute ischemic heart disease, cardiac arrhythmias and congenital heart disease between 1999 and 2010 in Alberta. The CIHI data have been used to compare practice patterns and outcomes in Alberta with those in other Canadian provinces.

Our extensive portfolio of research projects based on these data includes examining the following: socioeconomic and urban/rural differences in access to treatment and outcomes; outcomes among vulnerable populations such as women, the elderly, and ethnic minorities; the association of risk factors and use of evidence-based therapies on long-term outcomes; impact of alternative levels of care; resource utilization and costs of care; validity and reliability of disease coding; and novel methods to risk stratify patients.

A major goal of the CVC Outcomes group is to identify, inspire, and train junior faculty and students in the analysis of linked administrative healthcare databases. Trainees and junior faculty continue to feature prominently in our population health projects and manuscripts.

Business Office and Administration

The business office is fundamental to the organizational and financial underpinnings of the CVC. Reviewing and negotiating contracts is one of its key tasks, alongside providing expert service in the areas of managing agreements, developing and tracking metrics, and executing invoices and site payments. Dedicated to financial stewardship, the business office prudently manages revenue and expense administration. It is also committed to the progress of information systems management, strategic planning, process improvement, and the promotion of learning and development initiatives.

The business office is responsible for the creation and distribution of all marketing materials aimed at creating strong brand awareness that speaks to the mission and values of this organization. Finally, the office facilitates communications between the CVC and many institutional partners, which include, but are not limited to, Duke Clinical Research Institute (DCRI), Alberta Health Services (AHS), and Northern Alberta Clinical Trials and Research Centre (NACTRC). Our dedication to upholding strong partnerships with these institutions is essential to the day-to-day operations of the CVC.

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Faculty

Our CVC Faculty are internationally recognized as Thought Leaders in their respective areas of interest.

They represent a unique and dynamic integration of clinical research. The approach begins by addressing unmet clinical needs through conducting rigorous clinical investigation and clinical trials of novel diagnostic and therapeutic interventions in selected areas of cardiovascular medicine. It extends from that pivot to the knowledge gained through detailed registries of all patients in areas of particular interest and relevance to public health, namely Acute Coronary Syndromes and Heart Failure. Our group has been especially keen to explore better ways of analyzing the responses of patients to interventions by modeling their outcomes over time, taking account of the relative value patients put on differing outcomes and their implications for quality of life and health care costs. Finally we are well positioned to study health care outcomes at a population level for all Albertans to assess how well new advances are being applied and whether they are making a meaningful difference.

PAUL W. ARMSTRONG
MD
- Distinguished University Professor, Division of Cardiology, University of Alberta
- Formerly Chair of the Department of Medicine, University of Alberta
- Founding Director, Canadian VIGOUR Centre
- Founding Director of TORCH (Tomorrow’s Research Cardiovascular Health Professionals), a Strategic Training Program Initiative
- Founding President of the Canadian Academy of Health Sciences
- 2014 Recipient of the University Cup, the University of Alberta capstone award for outstanding contributions in teaching, research and service
- 2014 Recipient of the Margolese National Heart Disorders Prize awarded annually to a Canadian who has made outstanding contributions to the treatment, amelioration, or cure of heart disease

Dr. Armstrong’s research interests include:
- Development of novel methods to enhance clinical trial methodology
- Cardiovascular disease and its implications in the elderly
- Pathophysiology and novel therapeutic approaches of congestive heart failure
- Diagnosis and management of acute coronary syndromes with emphasis on timely interventions

JUSTIN EZEKOWITZ
MBCh, MSc
- Co-Director, Canadian VIGOUR Centre
- Associate Professor, Division of Cardiology, University of Alberta
- Director, Heart Failure Clinic, Mazankowski Alberta Heart Institute
- Alberta Innovates – Health Solutions Population Health Investigator

Dr. Ezekowitz’ research interests include:
- Testing the impact of drugs and processes of care for patients with acute heart failure
- Novel interventions for patients with chronic systolic and diastolic heart failure
- The impact of comorbidities such as atrial fibrillation, anemia and hip fractures in patients with heart failure
- Knowledge gaps for drugs and process of care in heart failure

SHAUN GOODMAN
MD, MSc
- Co-Director, Canadian VIGOUR Centre
- Associate Head, Division of Cardiology, Department of Medicine, St. Michael’s Hospital
- Heart & Stroke Foundation of Ontario (Polo) Chair and Professor, Department of Medicine, University of Toronto
- Adjunct Professor, Department of Medicine, University of Alberta

Dr. Goodman’s research interests include:
- Facilitating clinical trial, observational, and knowledge translation research in cardiovascular disease in Canada with a focus on:
- Diagnosis, management, and prognosis of acute coronary syndromes
- Optimal stroke prevention risk stratification and management in atrial fibrillation
- Primary and secondary prevention of cardiovascular disease
KEVIN BAINEY
MD
- Assistant Professor and Academic Interventional Cardiologist, Mazankowski Alberta Heart Institute, University of Alberta
- Director, Interventional Cardiology Fellowship Program, Mazankowski Alberta Heart Institute, University of Alberta

Dr. Bainey’s research interests include:
- Reperfusion strategies in ST-elevation myocardial infarction
- Ethnic-based clinical outcomes focusing primarily on South Asians with coronary artery disease

ROBERT WELSH
MD
- Professor, Division of Cardiology, University of Alberta
- Interventional Cardiologist, Mazankowski Alberta Heart Institute
- Director, Adult Cardiac Catheterization and Interventional Cardiology program
- Vice-President, Canadian Association of Interventional Cardiologists
- Co-chair of Vital Heart Response
- Co-chair of the Mazankowski TAVI Program

Dr. Welsh’s research interests include:
- Acute Coronary Syndromes and Interventional Cardiology
- Cardiovascular disease and diabetes
- Exercise physiology and cardiac physiology
- Pre-hospital management of STEMI and the interaction of pharmacological (antithrombotic and fibrinolytic) and mechanical interventions (primary and rescue angioplasty)

FINLAY A. MCAULISTER
MD, MSc
- Professor of Medicine, University of Alberta
- Director, Patient Health Outcomes Research and Clinical Effectiveness Institute, University of Alberta
- Senior Health Scholar, Alberta Innovates - Health Solutions (2010 - 2017)
- Capital Health Chair in Cardiovascular Health Outcomes
- Chair, Outcomes Research Task Force, Canadian Hypertension Education Program
- Past-President, Canadian Society of Internal Medicine

Dr. McAlister’s research interests include:
- Outcomes research in hypertension, heart failure, perioperative care, and coronary artery disease
- Clinical epidemiology methodology with a focus on evidence-based medicine and implementation of evidence at the bedside
- Methodology of trials and systematic reviews

PADMA KAUL
PhD
- Director, Outcomes Research, Canadian VIGOUR Centre
- Associate Professor, Department of Medicine, University of Alberta
- Adjunct Assistant Research Professor, Duke University Medical Center
- Adjunct Assistant Professor, School of Public Health, University of Alberta

Dr. Kaul’s research interests include:
- International differences in practice patterns and outcomes
- Sex differences in treatment and outcomes of cardiovascular disease
- Long term chronic disease implications for pregnancy related complications
- Issues related to access and delivery of care at a population level
- Health economics

SEAN VAN DIEPEN
MD
- Assistant Professor of Critical Care Medicine, Division of Critical Care and Cardiology, University of Alberta
- Academic Cardiologist-Intensivist

Dr. Van Diepen’s research interests include:
- Critical care cardiology
- Cardiovascular surgical care
- Cardiovascular risks of cardiac and non-cardiac surgery and heart failure

Dr. McAlister’s research interests include:
- Outcomes research in hypertension, heart failure, perioperative care, and coronary artery disease
- Clinical epidemiology methodology with a focus on evidence-based medicine and implementation of evidence at the bedside
- Methodology of trials and systematic reviews
Worldwide Collaborators

PROFESSEUR PHILIPPE GABRIEL STEG,
Departement de Cardiologie
Hopital Bichat, Assistance Publique-
Hopitaux de Paris

BRAZILIAN CLINICAL RESEARCH INSTITUTE
Sao Paulo, Brazil

DUKE CLINICAL RESEARCH INSTITUTE
Durham, USA

ESTUDIOS CLINICOS LATINOMERICA
Rosario, Argentina

GREEN LAKE COORDINATING CENTER
Auckland, New Zealand

FLINDERS MEDICAL CENTRE
Adelaide, Australia

LEUVEN COORDINATING CENTRE
Leuven, Belgium

NATIONAL HEALTH AND MEDICAL RESEARCH COUNCIL
– CLINICAL TRIALS CENTRE
Sydney, Australia

TRIALS ARGENTINE GROUP ORGANIZATION
Buenos Aires, Argentina

UPPSALA CLINICAL RESEARCH CENTRE
Uppsala, Sweden

Acknowledgments

CVC gratefully acknowledges and thanks:
- The patients, for their willing participation in trials, they are the heroes of clinical research;
- the CVC faculty, external advisors and collaborators for their contributions and for providing ongoing research opportunities, we look forward to providing continued services and to future collaborations;
- the CVC staff and management for their dedication, professionalism, excellent contributions and ingenuity that enhances the quality of our research work;
- our mentors for their commitment and enthusiasm as the next generation of researchers;
- the sponsors and granting agencies, without their financial support these trials and educational activities would not be possible;
- Shaffin Kherani, Ellen Pyear, and Oksana Grant for their time and the dedication required to produce this report;
- AM/YM for the concept and design;
- Photographer Stephen Wreakes for many of the images enclosed in this report;
- McCallum Printing Group Inc. for their service in printing this report and our Chronicle.