

# RESEARCH DIVISION

ANNUAL REPORT

APRIL 1, 2013- MARCH 31, 2014



## TABLE OF CONTENTS

<b>1. MESSAGE FROM THE CHIEF EXECUTIVE OFFICER AND PRESIDENT.....</b>	<b>4</b>
<b>2. MESSAGE FROM THE VICE-PRESIDENT .....</b>	<b>4</b>
<b>3. INTRODUCTION .....</b>	<b>5</b>
<b>4. CREATING A CULTURE OF RESEARCH AND INNOVATION IN AHS.....</b>	<b>5</b>
4.1 Strategic Clinical Networks .....	5
4.1.1 Addiction and Mental Health SCN .....	5
4.1.2 Bone and Joint Health SCN .....	6
4.1.3 Cancer SCN .....	6
4.1.4 Cardiovascular Health and Stroke SCN .....	7
4.1.5 Critical Care SCN .....	8
4.1.6 Diabetes, Obesity and Nutrition SCN.....	9
4.1.7 Emergency SCN .....	10
4.1.8 Respiratory SCN.....	11
4.1.9 Seniors Health SCN .....	11
4.1.10 Surgery SCN.....	12
4.2 Platforms for Innovation .....	13
4.2.1 Provincial Health Technology Assessment.....	14
4.2.2 SCN Health Technology Assessment and Adoption .....	14
4.2.3 Health Innovation Network .....	16
4.2.4 Portal of Industry Engagement.....	16
4.2.5 Innovation by Design.....	16
4.2.6 Communities of Practice .....	17
4.3 Clinical Research Activity in AHS .....	18
4.3.1 Research Projects and Revenue .....	18
4.3.2 Northern Alberta Clinical Trials and Research Centre .....	19
<b>5. BUILDING STRONG PARTNERSHIPS IN ALBERTA.....</b>	<b>19</b>
5.1 Alberta Children’s Hospital Research Institute.....	19
5.2 Alberta Diabetes Institute .....	20
5.3 Alberta Transplant Institute.....	21
5.4 Canadian VIGOUR Centre.....	22
5.5 Health Research Collaborative – Red Deer College.....	22
5.6 Institute for Reconstructive Sciences in Medicine .....	23
5.7 Libin Cardiovascular Institute of Alberta .....	23
5.8 Mazankowski Alberta Heart Institute.....	24
5.9 McCaig Institute for Bone and Joint Health .....	25
5.10 O’Brien Institute for Public Health.....	25
5.11 Ward of the 21st Century .....	26

5.12 Women and Children’s Health Research Institute .....	26
5.13 Alberta Clinical Research Consortium.....	27
5.14 SPOR SUPPORT Unit .....	27
<b>6. INCENTING RESEARCH OF THE HIGHEST VALUE TO AHS .....</b>	<b>28</b>
6.1 Alberta Partnership for Research and Innovation in the Health System .....	28
6.2 Central Zone Research Grants.....	29
6.3 MedStar Awards.....	30
6.4 Glenrose Rehabilitation Hospital .....	30
<b>7. BEING EFFICIENT WITH AHS RESOURCES .....</b>	<b>31</b>
7.1 AHS Data Repository for Reporting .....	31
7.2 Health Research Ethics Harmonization Initiative.....	32
7.3 Intellectual Property .....	33
7.4 Shared Data Model .....	33
<b>8. BEING EFFECTIVE WITH AHS RESOURCES .....</b>	<b>33</b>
8.1 Providing Training Opportunities .....	33
8.2 Supporting Research.....	34
8.2.1 Methods and Statistics .....	34
8.2.2 Project Management .....	35
8.2.3 Workforce Research .....	35
8.2.4 Evaluation Services .....	36
8.3 Sharing Knowledge .....	36
8.3.1 SharePoint Framework.....	36
8.3.2 Integrated Library Services and Website .....	37

## 1. MESSAGE FROM THE CHIEF EXECUTIVE OFFICER AND PRESIDENT

A good organization keeps pace with the latest advancements in its field; a great organization creates advancements for others to follow.

Alberta Health Services helps advance patient care every day by supporting clinicians and our academic partners who actively engage in health research. Research is fundamentally important to maintaining a high-performing, quality health system.

If there is one constant in the day-to-day business of providing health care to four million Albertans, it's that ours is a sector that's always evolving. Research is key to driving that evolution.

AHS is uniquely positioned to help fuel innovation in health care. Our provincewide structure enables broad and diverse research collaborations. New models of care bring health care teams together in new and different ways, with patients, families and caregivers at the centre of everything we do.

Through the Strategic Clinical Networks, AHS shares best practices in health care delivery across the province.

But research and innovation aren't just about improving patient outcomes and providing appropriate evidence-informed care; they also have the power to help the health system become more efficient and derive greater value from every health dollar.

Amid the often urgent demands of patient care it may be tempting to think of research as an extracurricular activity. However, research is central to moving health care forward and providing all Albertans with the best health care system possible.

The 2013/2014 AHS Annual Report on Research highlights the incredible research activities, achievements and stories that have had an impact on patient care. It is my hope that reading this report makes you as proud as I am of this important work.

Vickie Kaminski

AHS President and CEO

## 2. MESSAGE FROM THE VICE-PRESIDENT

Research and innovation are essential for giving patients the best health outcomes possible. Whether it's a clinical trial that offers a promising new medication, or a new technology that speeds up rehabilitation, the research taking place in the province's health system helps ensure that Albertans have access to the latest in medical care.

Teams throughout Alberta Health Services (AHS) are tasked with supporting, measuring and promoting the organization's work as it relates to research, innovation and analytics. This is a broad mandate that requires close collaboration with our many partners, but especially those in academia, the hospital foundations, government and industry.

In the pages ahead you'll see a snapshot of our work together in the past year. In particular, I'd like to call attention to two areas where research is a catalyst for advancing evidence-based health care: Strategic Clinical Networks (SCNs) and the new PRIHS program – Partnership for Research and Innovation in the Health System.

Our 10 SCNs are made up of people who are passionate and knowledgeable about specific areas of health, tasked to find new and creative ways of improving the delivery of health care. SCN membership includes patients and families, physicians, clinicians, community partners, researchers and staff. They continue to work on a variety of projects as you'll see in section 4.1.

This past year, the first 10 research grants were awarded under the PRIHS program, a funding partnership established by AHS and Alberta Innovates – Health Solutions. Worth a total of \$7.5 million, the three-year projects range from standardizing the use of CT scans in emergency departments to improving care for people suffering from back pain.

AHS is uniquely positioned to make sure that the knowledge arising from its research endeavors benefits our most important stakeholder – the patient. Working together, we can make sure research and innovation are at the heart of clinical practice.

### 3. INTRODUCTION

This 2013-2014 annual report on research highlights the achievements of health research activities throughout the province. As part of aligning with and implementing the Alberta Health Research and Innovation Strategy, co-led by Alberta Health and Alberta Enterprise and Advanced Education, AHS adopted the following strategies in 2012 to guide its actions:

1. Creating a culture of research and innovation in AHS,
2. Building strong partnerships in Alberta,
3. Incenting research of high value to AHS,
4. Being efficient with AHS resources, and
5. Being effective with AHS resources.

This report profiles the work that is being undertaken and achievements with respect to these five strategies. The report profiles the work that is being undertaken both within AHS and between AHS and the various research centres, institutes and networks throughout the province. Stories profiling this work have been embedded in the report as a mechanism to share the impact of research on the health care system and Albertans.

## 4. CREATING A CULTURE OF RESEARCH AND INNOVATION IN AHS

Research within AHS occurs in many settings – by independent investigators as well as research-focused groups. Research and innovation support health system improvement and sustainability, and provide a foundation for making decisions based on evidence. AHS is committed to spreading a culture of research and innovation by supporting research groups within AHS, creating frameworks that encourage innovation and evidence-based thinking, and bringing researchers together to exchange knowledge and ideas.

### 4.1 Strategic Clinical Networks

By March 2014, AHS had launched 10 Strategic Clinical Networks (SCNs, some formerly called Operational Clinical Networks) as part of its strategic plan to create a culture of research and innovation in AHS. Three more SCNs are in the planning phases (Kidney; Maternal, Child, Newborn and Youth; Primary Health Care). These multidisciplinary, pan-provincial groups recommend, implement and support decisions for strategic, evidence-based investments and disinvestments throughout AHS to improve healthcare delivery within their area of specialty. The SCNs now have Scientific and Assistant Scientific Directors and have launched research programs that address the health needs of their SCN's target population.

Some of the year's highlights for the SCNs are:

#### 4.1.1 Addiction and Mental Health SCN

- **Resiliency/Empathy Project:** The project was launched as a clinical trial in partnership with the Red Deer Public School District and the Red Deer Primary Care Network. This project screens students in grades 6-12 for risk of developing mental health issues and offers them online-based interventions with the goal of enhancing the mental health and wellness of students.

- **Adult Depression:** A randomized, controlled clinical trial of family physician interventions for depression in adults is on-going with an anticipated end date of early 2015. The goal is to determine the best way to treat depression in primary care.
- **Repetitive Transcranial Magnetic Stimulation (rTMS):** A Health Technology Assessment was conducted on rTMS to determine the feasibility of this technology for treatment-resistant depression. The assessment recommended piloting this technology, and sites in Calgary have expressed interest.

#### 4.1.2 Bone and Joint Health SCN

- **Optimizing Central Intake to Improve Arthritis Care:** The SCN received a Partnership for Research and Innovation in the Health System (PRIHS) grant for a project that will identify, implement and evaluate a centralized system for prioritizing and referring patients with osteoarthritis and rheumatoid arthritis. The goal is to improve access to arthritis care in Alberta.
- **Spine Access Alberta:** The SCN received a PRIHS grant for a project that will create and evaluate a new model of care for back pain. Multidisciplinary teams at two pilot centres will assess, prioritize and treat patients with back problems with the goal of clearing the backlog of patients waiting for unnecessary consultations and helping those who do need a specialist to see them faster.
- **Researcher Database:** A Bone and Joint Health SCN researcher database was established.
- **Research Electronic Data Capture (REDCap):** A REDCap tool was developed for the surveillance of bone and joint health patients in the province of Alberta.
- **Research Priority Setting:** A Provincial Research Advisory Committee was established to set strategic research priorities and provide consultation on research direction for the next five years.



ABOVE: Dr. Jason Werle, AHS Division Head of Joint Reconstruction, with hip-replacement patient Kelly Anhelher.seeds using computer-guided needles.

#### Improving accessibility to orthopedic care

Albertans are waiting less time for hip and knee surgeries and going home sooner after their procedures since the launch of a province wide AHS program designed to improve the quality and accessibility of orthopedic care. The Hip and Knee Replacement Program has reduced the time between the decision to have surgery and the surgery date to 19.2 weeks, down 12%, or almost three weeks, from when the program launched in 2010.

[www.albertahealthservices.ca/9734.asp](http://www.albertahealthservices.ca/9734.asp)

#### 4.1.3 Cancer SCN

- **Rectal Cancer Clinical Care:** A PRIHS-funded project to develop a clinical care pathway for rectal cancer is underway. The team will provide training to health care professionals on how to provide the best possible treatments for stage II and stage III rectal cancer patients. Baseline data collection is underway. A reduction in cancer recurrence from 11% to 4% is expected.
- **Workforce Optimization:** The growing population of cancer patients in Alberta will soon outgrow resources to provide care. A research study to look at the effect of nurse practitioner- delivered care on patient outcomes and costs to the health system is underway.



ABOVE: Radiation oncologist Dr. Siraj Husain implants radioactive seeds using computer-guided needles.

- **Palliative and End of Life Care:** A cross-cutting SCN research proposal is underway in partnership with the Cardiovascular Health and Stroke SCN to develop a clinical care pathway for patients with end stage diseases, such as chronic heart failure and cancer. The goal of the proposed work is to provide patients with symptom management at home and reduce unnecessary hospital visits.
- **Cancer Biomarkers:** A Biomarkers Forum was held this past year. The newly established Biomarkers Working Group will review how cancer biomarker tests are currently used and explore future opportunities.
- **Enhanced Recovery After Surgery (ERAS):** The development of an ERAS guideline for head and neck cancer surgery is underway. The goal of the guideline is to optimize recovery following surgery by defining best practice for feeding, use of pain-killers, and mechanical ventilation.
- **Research Strategic Plan:** A Research Strategic Planning Meeting identified key elements to be included in the research plan, including how the SCN can best partner with and support cancer researchers. The draft research plan is currently under development.

#### Innovative breast cancer treatment comes to Alberta

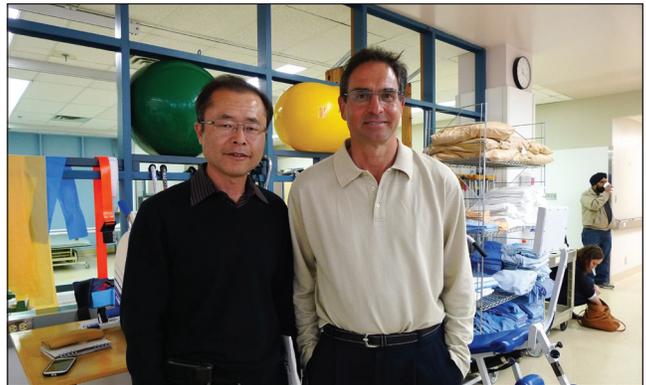
Oncologists at the Tom Baker Cancer Centre in Calgary are now performing an innovative breast cancer treatment that uses implanted radioactive seeds, each the size of a grain of rice, to kill remaining cancer cells after the removal of a tumour. It's a first in Alberta, where about 20 low-risk patients will be part of a national study on the one-day procedure, called breast brachytherapy. This treatment could provide another option to the traditional treatment, which uses an external radiation beam to eliminate remaining cancer cells over the course of several weeks.

[www.albertahealthservices.ca/9465.asp](http://www.albertahealthservices.ca/9465.asp)

#### 4.1.4 Cardiovascular Health and Stroke SCN

- **Research Funding Obtained:** Research funding was obtained from the Heart and Stroke Foundation of Canada, the Canadian Institutes of Health Research, PRIHS, and Collaborative Research and Innovation. The latter two projects are focused on remote heart rhythm monitoring and stroke care quality improvement, respectively.
- **Remote Monitoring:** The SCN was awarded a PRIHS grant on "Performance Evaluation and Rhythm Follow-up Optimization with Remote Monitoring (PERFORM)." The PERFORM project aims to improve prevention, outcomes and access to care for those with heart rhythm disorders using remote monitoring technology in the patients' communities. The goal is to ensure that patients receive the therapies they need, improve access to arrhythmia care, and reduce unnecessary hospital visits.
- **Acute Coronary Syndrome:** The SCN is studying treatment strategies for acute coronary syndrome patients (i.e. those with obstruction of the blood vessels of the heart). The results will allow for alignment of best practices and patient outcomes throughout the province.
- **Outcome Assessment in Heart Disease:** The SCN provided funding and expertise to the Alberta Provincial Project for Outcome Assessment in Coronary Heart Disease (APPROACH). New database modules were developed, including one for stroke.

- **Stroke Action Plan:** The Stroke Action Plan aims to establish evidence-based provincial guidelines to enhance care of stroke patients across 15 rural and small urban primary stroke centres, along with establishing a community-based stroke rehabilitation service to support early discharge and rehabilitation. Early results have been promising, with patients returning to their homes sooner and recovering faster with less stress, due to the provision of in-home rehabilitation services by multidisciplinary teams.
- **Organization of Research Resources:** The SCN and front-line workers have a manuscript in press demonstrating that the organization of research resources into a focused network increases access to expertise necessary to translate clinical knowledge into research and back again.



ABOVE: Study authors Dr. Hude Quan, left, and Dr. Norman Campbell.

#### Tracking the toll of hypertension

In a study that tracked 3.5 million Canadians with high blood pressure, researchers found that men, the elderly, and people living in low-income or rural areas generally have poorer health outcomes than other segments of the population. Until now, information on the overall state of the population has not been available. These findings will provide a benchmark to determine whether future prevention and treatment approaches in addressing hypertension are having an impact.

[www.albertahealthservices.ca/8541.asp](http://www.albertahealthservices.ca/8541.asp)

#### 4.1.5 Critical Care SCN

- **Intensive Care Unit (ICU) Capacity:** The SCN was awarded a PRIHS grant to evaluate the capacity of ICUs to care for critically ill patients in Alberta. The project will investigate the causes of strain on ICU capacity in Alberta with the goal of improving access.
- **Improved Care for ICU Patients:** The SCN was awarded a PRIHS grant to identify evidence-care gaps in critical care within Alberta and develop interventions to close them.
- **Discharge E-Tool:** The SCN was awarded a grant from the Technology Evaluation in the Elderly Network, funded by the Government of Canada's Networks of Centres of Excellence program. The grant aims to develop an evidence-informed intensive care unit discharge e-tool.
- **Research Competition:** The SCN held a competition for research proposals designed to provide critically ill patients with better care and better health and was able to fund four projects through the Scientific Director's office:
  1. Blackwood, J. "Metabolomics and cytokine analysis for the differentiation of life-threatening and non-severe appendicitis in the pediatric population,"
  2. Jenne, C. "The role of platelets and neutrophil extracellular traps (NETs) in disseminated intravascular coagulation,"
  3. Niven, D. "The adoption and de-adoption of intensive insulin therapy among critically ill adults," and



ABOVE: Researcher and critical care physician Dr. Andreas Kramer.

4. Van Diepen, S. “Improving care transitions in post-operative cardiac surgery patients.”
- **Abstract/Presentation Competition:** The Alberta Society of Intensive Care Medicine and the Critical Care SCN jointly held a successful trainee abstract/presentation competition. Ten trainees were short listed through the abstract competition to present their research to members of the Alberta Society of Intensive Care Medicine and a panel of judges.

#### Survival rates improve for brain-injury patients

Patients hospitalized for brain injuries are more likely to survive than they did a decade ago, and more likely to return home without requiring any long-term medical support, according to a research study. The study, which tracked nearly 4,100 southern Albertans with severe brain injuries in Calgary’s adult intensive care units, shows survival rates for these patients have increased by 10% since the study began 12 years ago. Roughly seven of every 10 patients with critical brain injuries now survive.

[www.albertahealthservices.ca/9270.asp](http://www.albertahealthservices.ca/9270.asp)

#### 4.1.6 Diabetes, Obesity and Nutrition SCN

- **Care and Rehabilitation for Severe Obesity:** The Diabetes, Obesity and Nutrition SCN was awarded a PRIHS grant for a project that will identify the barriers and develop solutions for providing tertiary care to adults and children with severe obesity in Alberta.
- **Diabetes and Pregnancy:** The SCN developed an evidence-informed process for establishing provincial standards of care for diabetes in pregnancy and gestational diabetes and pilot-tested the process. As well, a gestational diabetes research planning meeting was held in March 2014 as an integral part of the annual retreat for the Alliance for Canadian Health Outcomes Research in Diabetes.
- **Bariatric Care:** The SCN worked with the Canadian Institutes of Health Research’s Institute of Nutrition, Metabolism and Diabetes and AIHS to establish partnership funding for a team grant in Bariatric Care and supported the development and submission of three Alberta-based projects on weight loss surgery.
- **Enhanced Recovery After Surgery (ERAS):** The SCN has partnered with the Surgery SCN in the ERAS project (see section 4.1.10).



ABOVE: Dr. Lois Donovan with patient Lauren Moore, who wore a glucose monitor during her pregnancy.

#### Researching continuous glucose monitoring in pregnancy

Calgary is the only Canadian site outside of Ontario taking part in an international trial to evaluate the effectiveness of using a continuous glucose monitor (CGM) in pregnancy. A CGM system consists of a small sensor inserted in the skin of the abdomen that transmits blood sugar readings every five minutes to a monitor similar to a pager. The study will determine if CGMs help women keep better control of their diabetes. High blood sugar levels can lead to complications in pregnancy and, in extreme cases, even birth defects.

<http://www.albertahealthservices.ca/9552.asp>

#### 4.1.7 Emergency SCN

- **Use of Computerized Tomography (CT):** Members of the Emergency SCN were awarded a PRIHS grant on improving decisions around the use of CT scans in Alberta's emergency departments. The project will give physicians access to tools that will help them make better choices and engage patients into important and informed discussions over risks and benefits.
- **Asthma:** The SCN obtained federal and provincial funding for a project on sex differences in emergency department presentations and outcomes for asthma.
- **Surveillance for Occupational Illnesses:** The project will assess the validity and frequency of surveillance for occupational illnesses and injuries in emergency departments.
- **Cardiac Biomarkers:** Negotiations were initiated to fund a cardiac biomarker study in patients with acute chest pain in the University of Alberta Hospital Emergency Department.
- **Letters of Intent:** The SCN was a research partner in six successful Letters of Intent for the 2014 PRIHS grant competitions: two projects within the Emergency SCN, three cross-cutting initiatives (Seniors Health, Respiratory and Addiction & Mental Health SCNs) and one project under the Respiratory SCN.
- **Conference Hosting:** The SCN co-hosted the Western Emergency Department Operations Conference 2014 in Edmonton in partnership with the University of Alberta, University of British Columbia and University of Calgary. The conference attracted 200 attendees.
- **Publications:** A total of 48 scientific abstracts from the Emergency SCN's Research Office were accepted for presentation at national and international conferences and 19 articles were published in peer-reviewed journals.
- **Undergraduate Studentships:** The Emergency SCN awarded three undergraduate studentships (Calgary, 2; Edmonton, 1) in a unique Summer Studentship Award.



ABOVE: Dr. Stephen Freedman and study participant 18-month-old Rylen, with his mom Jaime.

#### Probiotics tested in the ER for gastroenteritis

Children with stomach flu who arrive at the Alberta Children's Hospital emergency department in Calgary have the option of participating in a national research study examining the effectiveness of a probiotic (microorganisms that have beneficial health effects). The theory is that a probiotic agent may have the potential to calm the immune system, allowing it to focus on the infection with minimal adverse effects to the child. The multi-centre study is the largest of its kind in North America and will test nearly 900 children ranging in age from three months to four years.

[www.albertahealthservices.ca/8576.asp](http://www.albertahealthservices.ca/8576.asp) and [page 1 and 5](#)  
[www.albertahealthservices.ca/ahs-zone-print-calgary-2013-09.pdf](http://www.albertahealthservices.ca/ahs-zone-print-calgary-2013-09.pdf)

#### 4.1.8 Respiratory SCN

- **Asthma Working Group (AWG):** This group was awarded the 2013 President's Excellence Award for Outstanding Achievements in Research by Alberta Health Services. The AWG's achievements include developing, implementing and evaluating asthma clinical pathways to support practice across three areas of the care continuum – Emergent/Urgent, Inpatient and Primary Care. The pathways standardize care across Alberta, allowing equitable care across the province and decreasing health-care costs. In addition, the AWG created an innovative, interactive online pathways curriculum to support standardized staff training on a provincial scale.
- **Order Set for Chronic Obstructive Pulmonary Disease (COPD):** Order Sets are conveniently grouped medical orders that work to standardize diagnosis and treatment. The COPD Order Set was created for use during admission of patients with COPD as part of a broader strategy to enhance patient management and decrease length of stay. The COPD Order Set was successfully piloted at the Peter Lougheed Hospital, and is now the only admission order set presently in the Sunrise Clinical Manager system. Data analysis is ongoing; however, early results indicate that the intervention achieved a 60% improvement in order set usage from launch and achieved a 1- day decrease in median length of stay for COPD inpatients.
- **Letters of Intent:** Two Letters of Intent were selected to go forward to full application for the 2014 PHRIS grants. One project is within the emerging Primary Health Care SCN (Primary care pathway for childhood asthma) and the other project is a cross-cutting initiative with the Emergency SCN (Developing and assessing the effectiveness of a post-discharge care pathway to reduce emergency department re-visits and hospital re-admission rates for patients with COPD).
- **Canadian Institutes of Health Research Dissemination and Planning Grant:** An application was submitted for a patient engagement project to design a clinical discharge pathway and lay summaries for acute exacerbations of COPD.



#### Waterpipe smoke from herbal shisha poses risks

The smoke produced when herbal shisha is burned in a waterpipe contains substances that may pose a significant threat to the health of both the smoker and those exposed to the smoke, according to a research study. Researchers with the University of Alberta and AHS in Edmonton have found that samples of some herbal shisha products sold in Alberta contain levels of toxic trace metals and cancer-causing chemicals equivalent to, or in excess of, those found in cigarette tobacco. Further, air quality tested in six Edmonton waterpipe cafes was found to be worse than in a casino where cigarette smoking is allowed. This is believed to be the first study to report on second-hand smoke emissions from tobacco-free waterpipe products.

[www.albertahealthservices.ca/9346.asp](http://www.albertahealthservices.ca/9346.asp)

#### 4.1.9 Seniors Health SCN

- **Elder-Friendly Surgical Unit:** The Seniors Health SCN was awarded a PRIHS grant to evaluate elder-friendly surgical care and pilot a new elder-friendly surgical unit. The unit will offer customized care, evidence-based practices and tailored transitions to assist patients in returning to their home.

- **Advance Care Planning (ACP):** ACP is the process of discussing and documenting the wishes and preferences a person has on his or her medical care for the future, when health may deteriorate. The Seniors Health SCN collaborated with the Cancer SCN and others on a project to study how to optimally implement widespread uptake of a formalized ACP framework across a large population and throughout a complex, multi-sector healthcare system. The project is funded by an AIHS-Collaborative Research and Innovation Opportunities grant.
- **Brain Aging and Dementia:** The SCN collaborated with Campus Alberta Neuroscience on an application submitted to Brain Canada related to healthy brain aging and dementia.
- **Patient Engagement:** A research project was initiated to understand what older adults consider to be the most important issues affecting their health and healthcare in Alberta.
- **Research Events:** The Seniors Health SCN held an Alberta Researcher Engagement event in January, 2014 and co-sponsored a pan-provincial research event in March, 2014 to initiate applied health research collaborations across the provinces in attendance.
- **Conference for Family Caregivers:** The SCN gave a two-day conference and research planning session on supporting family caregivers of seniors. The conference was co-led with Covenant Health and funded by the Canadian Institutes of Health Research.
- **Systematic Reviews:** The SCN supervised three trainees in the completion of systematic literature reviews concerning the dementia practice guidelines, the role of nutrition in preventing cognitive decline, and screening tools for diagnoses of depression in people with dementia. These articles have been accepted for publication.

#### Reducing medication use in long-term care residents

Eleven long-term care sites across the province are helping to research, review and implement new guidelines around the appropriate use of antipsychotic medications for dementia patients. The project aims to reduce the use of antipsychotic medications by helping staff manage residents' challenging behaviours with alternative treatments such as music, exercise and art. The research is led by the Seniors Health and the Addiction and Mental Health SCNs.

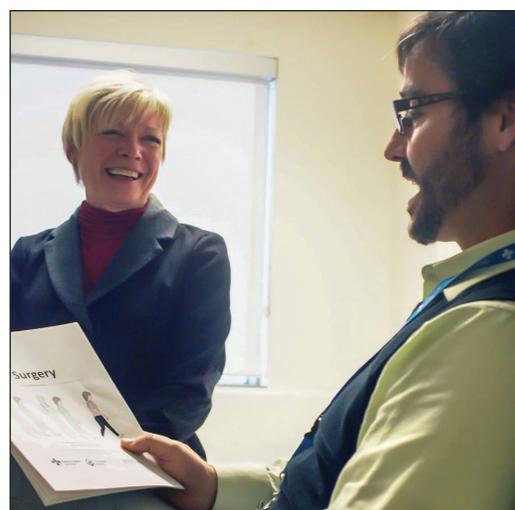
[www.albertahealthservices.ca/9589.asp](http://www.albertahealthservices.ca/9589.asp)

#### 4.1.10 Surgery SCN

- **Enhanced Recovery After Surgery (ERAS):** The Surgery SCN received funding from PRIHS for a three-year project to study the implementation of international guidelines for ERAS. ERAS evidence-based guidelines bundle a number of protocols aimed at accelerating recovery, decreasing perioperative stress, pain and gut dysfunction, and reducing severity of complications for patients undergoing major surgery. Several new ERAS protocols will be tested at two sites in Alberta, building on existing experience with ERAS protocols for colorectal surgery. The research includes a multifaceted program including knowledge translation strategies, program evaluation and health economic assessment.
- **Patient and Community Engagement Research (PACER):** The PACER program, developed by AHS and the University of Calgary, trains citizens living with various health conditions (or family caregivers) in health research and evaluation. These individuals then provide a patient voice to research and implementation projects within AHS. The Surgery SCN partnered with the PACER program to better understand the perioperative experiences of surgical patients and to examine the use of the Safe Surgery Checklist. This led to increased awareness and impact of the checklist, including the creation of educational materials for patients and staff.
- **Adult Coding Access Targets for Surgery (aCATS):** The aCATS project aims to standardize surgical wait times in Alberta. The evaluation of the initial pilot was led by the Evaluation Services team of AHS Research Priorities and Implementation Department. The outcomes have been instrumental in planning the spread of aCATS to all 59 surgical facilities across Alberta.
- **Evidence Decision Support Program (EDSP):** The Surgery SCN's EDSP provides a model to make evidence-informed decisions about whether, and under what conditions, adoption of innovations should be implemented.

This year, the EDSP reviewed more than a dozen emerging practices for the Surgery SCN:

- Robotic assisted surgery (province-wide review being conducted),
- Vertebral disc prosthesis for the cervical or lumbar spine (approved for use subject to operations and finance approval),
- Ultrasonic bone scalpel (recommendation to proceed with product evaluation),
- Diagnostic tool for coagulation monitoring (recommended for clinical trial), Photodisinfection therapy to decrease surgical site infections (recommended for clinical trial),
- Preoperative skin preparation (standardization to chlorhexidine in 70% alcohol approved for adoption – policy approval and implementation strategy underway),
- Preoperative pregnancy test (literature review and survey presented to the Surgery SCN),
- Combination device that cuts and seals blood vessels (approved for limited clinical evaluation),
- Bone graft substitute for foot and ankle fusions (approved for a limited number of cases),
- Bone stimulating bone graft substitutes (determining patient selection criteria and procedural indications),
- Implantable rods for children with scoliosis (recommended for additional evaluation),
- Middle ear implants (participation in provincial review),
- Antibiotic prophylaxis for patients with cardiac or orthopedic implants prior to dental procedures (provided review to appropriate leaders for decision), and
- EDSP staff also provided a series of workshops to engage and educate managers throughout the province in the use of the EDSP and provide feedback for improvement. The future direction is to spread the EDSP to other SCNs.



ABOVE: Surgery patient Joan Poplawski and Dr. Michael Chatenay at the Grey Nuns Community Hospital in Edmonton.

#### Enhanced Recovery After Surgery Protocols for surgery patients

The Enhanced Recovery After Surgery (ERAS) project aims to optimize care before, during and after surgery, in an effort to get patients back on their feet sooner while shortening hospital stays and reducing complications after surgery. Drawing from best practices around the world, the project helps patients improve their strength leading up to surgery, and keeps them strong throughout by reducing fasting times and encouraging carbohydrate loading. Following surgery, patients are up and moving as soon as possible, which might involve adjustments to their medications so they can physically move and eat sooner.

[www.albertahealthservices.ca/9440.asp](http://www.albertahealthservices.ca/9440.asp)

## 4.2 Platforms for Innovation

AHS is creating a culture of innovation where innovative thinking is applied to resolving problems of the highest importance to Albertans and the health care system. To do this, AHS collaborates with partners to create a variety of innovation platforms that:

- Streamline the assessment and adoption of new innovations and technologies,
- Identify areas for which new innovations and technologies are needed and encourage industry to be a partner in developing innovations that meet those needs,
- Identify innovations that improve service delivery, and
- Develop communities of practice that share information and experience.

The following are various innovation platforms now available within AHS.

#### 4.2.1 Provincial Health Technology Assessment

The Alberta Health Technologies Decision Process (AHTDP) is tasked with the evaluation and clinical and cost effectiveness of emerging healthcare interventions and their public funding within Alberta's health system. The advisory committee for the process, the Alberta Advisory Committee on Health Technologies, is co-chaired by the Assistant Deputy Minister and the Associate Chief Medical Officer of the SCNs and includes members of the Research, Innovation and Analytics Portfolio. AHS has a number of key responsibilities in support of the AHTDP, including:

- Identification of health technologies requiring assessment and reassessment,
- Identification of appropriate AHS representation to Expert Advisory Groups,
- Development of an Operational and Financial Impact Analysis that evaluates the feasibility of implementation or disinvestment of the specific health technology under review,
- Completion of stakeholder consultation within AHS prior to a policy decision, and
- Implementation of the Deputy Minister's policy decisions resulting from the health technology review.

Achievements for the fiscal year include:

- **Health technology identification:** AHS identified four potential technologies for the AHTDP process, three of which were approved for provincial review. Repetitive Transcranial Magnetic Stimulation (rTMS) for treatment-resistant depression and Gamma Knife for intracranial radiosurgery, and a reassessment of Appropriate use of antipsychotics in the management of responsive behaviours associated with dementia in residents of long-term care facilities.
- **Expert Advisory Groups:** AHS provided membership to Expert Advisory Groups for various reviews including the Alberta Newborn Metabolic Screening Program, renal denervation for resistant hypertension, appropriate use of antipsychotics in the management of responsive behaviours associated with dementia in residents of long-term care facilities, lung cancer screening, and rTMS.
- **Impact Analyses:** Operational and Financial Reviews were completed as part of the review of Temporomandibular Joint Replacement (January 2013), Hysteroscopic Tubal Sterilization (April 2013, revised in October 2013), Radiofrequency Ablation for low back pain (April 2013), OncoType DX (June 2013), Assisted Reproductive Technologies (June 2013), and Sleep Studies for Sleep Disordered Breathing in Adults (October 2013).
- **Stakeholder Consultation:** Stakeholder consultation within AHS was completed for Hysteroscopic Tubal Sterilization, Islet Transplantation, Middle Ear Implants, OncoType DX, Radiofrequency Ablation, Surgical Robotics, and Temporomandibular Joint Replacement as part of the process for determining provincial policy regarding public funding in Alberta for each of these technologies.
- **Decision Implementation:** In 2013, the Deputy Minister made final policy decisions for Portable Prothrombin Time Systems, Transarterial Radioembolization for hepatic neoplasia, Middle Ear Implants, Surgical Robotics, OncoType DX, and Radiofrequency Ablation for low back pain. AHS is in the process of implementing these policy directives.

#### 4.2.2 SCN Health Technology Assessment and Adoption

The SCN Health Technology Assessment and Adoption team of AHS supports the SCNs in evidence-informed decision making through the exchange, synthesis, and application of health technology-related knowledge to quickly capture the benefits of research. This may involve synthesizing evidence to produce rapid reviews, full health

technology assessments or reassessments, operational financial impact analyses, economic analyses and benefits realization plans. Some of the major SCN-related projects include:

- Coordination of the Repetitive Transcranial Magnetic Stimulation project through to the Alberta Health Technologies Decision Process for provincial review and policy recommendations for the Addiction and Mental Health SCN;
- Development of an operational financial impact assessment for a low dose CT scan lung cancer screening program for the Cancer SCN;
- Support for the development of an economic decision model for the Stroke Action plan and Stroke Rehabilitation projects for the Cardiovascular and Stroke SCN;
- Development of a Knowledge Translation plan and evaluation framework for the reassessment of clinical practices in the intensive care unit for the Critical Care SCN;
- Development of a Benefits Realization plans for the Enhanced Recovery After Surgery project for the Diabetes, Obesity and Nutrition SCN and for the LINAC Magnetic Resonance project for the Cancer SCN;
- Support for the Upper Gastrointestinal Bleeding project and subsequent grant submission for the Emergency SCN;
- Several rapid reviews and HTAs conducted on various technologies for the SCNs;
- Implementation and operationalization of a Provincial Strategy on HTA and Reassessment within AHS to support the evidence needs of the SCNs, zones, and program leaders;
- Development of a protocol for horizon scanning of new and emerging technologies for the SCNs which will be further developed and implemented in the next fiscal year. As part of this work, the team also participated in the development and launch of a “Top 10 New and Emerging Health Technologies Watch List: 2014” that was shared via the Canadian Network for Environmental Scanning in Health <http://www.cadth.ca/en/products/environmental-scanning/overview/cnesh>; and
- Delivery of five workshops to 50 staff and program leaders in each of the five zones to provide them with an understanding of health technology assessment and knowledge translation. Development of a health economics module is planned for the future.



ABOVE: Patient Art Cunningham bowls on the Nintendo Wii as part of research study evaluating the gaming system as a rehabilitation tool for stroke patients.

#### Researchers looking at Wii for stroke rehab

Researchers in Calgary are studying the use of a popular gaming system in stroke rehabilitation as part of a nationwide study that could lead to improved outcomes for stroke patients. The multi- centre study examines the effectiveness of using Nintendo Wii – a virtual reality gaming system – in rehabilitating stroke patients who have limited mobility in their upper extremities. The study will involve 160 stroke patients across Canada, including 10 each at Foothills Medical Centre and Dr. Vernon Fanning Centre.

[www.albertahealthservices.ca/8625.asp](http://www.albertahealthservices.ca/8625.asp)

### 4.2.3 Health Innovation Network

The Health Innovation Network (HIN) comprises representatives of AHS, the Ministries of Alberta Health and Alberta Innovation and Advanced Education, AIHS, Alberta Innovates Technology Futures, Institute of Health Economics and industry. The group expanded its membership in early 2013 to include the Ward of the 21 Century and BioAlberta (an industry association for life sciences and health) and are examining ways of streamlining processes and pathways for accelerating the application and use of new health technology innovations. Its goal is to create a culture that will stimulate innovative thinking and build a foundation in which to identify the needs of AHS and align the priorities of research, government and funding organizations to support these needs. The Health Innovation Network is co-chaired by AHS and Alberta Innovates Technology Futures.

Achievements include:

- Preliminary results on the Phase 1 pilot of the GE Healthcare Virtual Care Management Program conducted initially with the Sherwood Park Primary Care Network. This project addresses the chronic care and high needs population to be able to care for them in their own homes using GE VCM technologies. Phase 1 of the pilot tested the technology and validated the assumptions on meeting patient needs and cost savings with a small patient population at risk of heart failure through the Network;
- Sponsoring and facilitating a “Hacking Health” event in which innovators could present their ideas to representatives from AHS/HIN to foster collaboration on promising projects that could be developed together to provide solutions to health system needs;
- Supporting the Glenrose Rehabilitation Hospital’s Reverse Tradeshow in which clinicians present real clinical problems and issues where they are seeking innovative solutions in the area of rehabilitative technologies;
- Forming linkages and relationships with external agencies and supporters of health innovation including BioAlberta, Alberta Health Industry Association, Ward of the 21st Century, TEC, Alberta Council of Technologies, Innovate Calgary and Licensing Executives Society; and
- Facilitating major initiatives such as the Living Laboratory Roundtable and monitoring/reporting projects of priority to the HIN.

### 4.2.4 Portal of Industry Engagement

The Portal for Industry Engagement is a platform to facilitate improvements in positive health outcomes, health system efficiencies, and economic benefits by conducting activities in collaboration with partners, facilitators and other support organizations in four phases of the innovation cycle:

1. Identify and prioritize,
2. Validate needs within AHS,
3. Facilitate finding solutions (early stage product development and demonstration projects), and
4. Develop solutions (technology adoption and post-market analysis).

Projects that have passed through or have been assessed using methodologies defined by the Innovation Portal during this reporting year include:

- LINAC-MR, a medical linear accelerator (LINAC) coupled to a magnetic resonance imaging system (MR) for real-time guidance of radiotherapy treatments;
- Smart-e-pants, pressure ulcer prevention underwear;
- ITClamp, a hemorrhage-control device; and
- IT-related/mobile health applications.

### 4.2.5 Innovation by Design

This year, the Major Initiatives Department of AHS developed an innovation framework called “Innovation by Design.” The framework will help clinical design and innovation teams:

- Identify, prioritize and focus on specific areas where they believe they can improve the value of their service delivery;
- Establish clear “measures of better” that reflect clinical, operational and financial improvement goals;
- Design and test changes before full implementation to ensure that the focus area is “measurably better;”
- Quickly scale, and then spread, the innovative changes throughout the Province; and
- Provide stakeholders with a compelling improvement story that clearly shows that innovation and improvement efforts were worth the amount of time, talent and the treasury that was invested.

This framework calls for the application of “benefits realization” thinking and methods. This thinking can help innovation teams increase the probability that their major initiatives will succeed at scale. This team has applied this work to the Enhanced Recovery After Surgery project of the Surgery SCN and Diabetes, Obesity and Nutrition SCN.

This team has developed a workshop and given a number of shorter presentations to 100 AHS senior and health care staff over this past year.



ABOVE: Shannon Barnard of AHS and Peyman Azad Khaneghah and Pranshu Arora of the University of Alberta test GPS tracking technology, which is being used to monitor seniors with dementia who are at risk for wandering.

#### GPS device supports seniors and caregivers

The Locator Device Project examines how GPS technology within a wrist watch, a shoe, or a small cellphone-like device may help improve the safety and quality of life for dementia patients at risk for wandering and getting lost. The six-month trial involves 20 clients and their caregivers in Calgary and Grande Prairie. GPS-user location is reported real-time and the co-ordinates are plotted on a Google map. The project is being jointly run by researchers at AHS and the University of Alberta’s Faculty of Rehabilitation Medicine, and is funded by Innovation and Advanced Education within the Government of Alberta.

[www.albertahealthservices.ca/10067.asp](http://www.albertahealthservices.ca/10067.asp)

#### 4.2.6 Communities of Practice

- **Alberta Evaluation Network:** The Alberta Evaluation Network is an informal community of practice involved in health-related evaluation, quality or research initiatives. This fiscal year, the Network hosted bi-monthly meetings and offered a Learning Series on a variety of topics related to best practices in evaluation.
- **Health Economics Community of Practice:** The Health Economics Community of Practice was formed in early 2013/14 and is supported by AHS and the University of Alberta. There are over 50 members including AHS staff and leaders who either have expertise in health economics or are dealing with economic evaluation in their daily work. Over its first year, the community has focused on developing a “health economics primer” that will help standardize health economics practices in AHS. Concepts such as value for money, prioritization, benefits realization, and costing methodologies were identified as key factors to be included in a practical health economics primer by 2014/15.

## 4.3 Clinical Research Activity in AHS

### 4.3.1 Research Projects and Revenue

A tremendous amount of health research and innovation occurs every day in AHS. In this fiscal year, over 635 new research projects were opened. For new cancer-related research alone, this involved 927 registered patients with \$8M of drugs provided to these patients by industry. Because several of the Research Ethics Boards transitioned to an electronic platform this year (see section 7.2), the total number of active research projects is not available; however, it was in excess of 2800 (Table 1) involving almost \$50M in research funds (Table 2).

TABLE 1. NUMBER OF RESEARCH PROJECTS IN FISCAL YEAR 2014

Zone	No. of New Projects Opened	No. of Active Studies	No. of Unique Researchers with Active Accounts
Edmonton Zone and Cancer Care - Edmonton <sup>a</sup>	542	1843	395
Calgary Zone <sup>b</sup>	ND	407	134
North Zone <sup>c</sup>	2	ND	ND
Central Zone <sup>c</sup>	5	ND	ND
South Zone <sup>c</sup>	2	ND	ND
Cancer Care - Calgary <sup>d</sup>	40		
<b>TOTAL</b>	<b>591</b>		

<sup>a</sup> Studies with an executed Clinical Trial Agreement and AHS administrative approval by the Northern Alberta Clinical Trials and Research Centre. This number includes adult oncology studies opened at the Cross Cancer Institute (Edmonton, n=44); data from Alberta Cancer Clinical Trials.

<sup>b</sup> Active clinical research studies that have overhead allocated to AHS (typically industry clinical trials); data from Calgary Centre for Clinical Research. This number EXCLUDES clinical research funded by investigators, Tri-Council agencies or other funders. As context, in 2011/12, the Conjoint Health Research Ethics Board (CHREB) estimated that it approved the opening of 450 health research studies by investigators at the University of Calgary. This is the last year that CHREB captured its activity data using the same methodology. In Edmonton, 553 studies were opened in 2011/12.

<sup>c</sup> Data from Zone Research Committee.

<sup>d</sup> Adult oncology studies opened at the Tom Baker Cancer Centre, Calgary; data from Alberta Cancer Clinical Trials.

ND: No data are available. This reflects transition of several Research Ethics Boards over to an electronic platform in 2013/14.

TABLE 2: RESEARCH REVENUE

	Other Grants (Including Industry) <sup>a</sup>	Other - Prov Govt <sup>b</sup>	Donations <sup>c</sup>	Investment Income <sup>d</sup>	Other Revenue <sup>e</sup>	Total Revenue
2012	\$25,205,480	\$6,142,446	\$10,670,151	\$87,107	\$4,963,087	\$47,068,271
2013	\$24,350,375	\$3,861,107	\$10,226,494	\$52,123	\$6,420,125	\$44,910,224
2014	\$29,570,643	\$7,616,346	\$8,613,852	\$35,852	\$4,035,553	\$49,872,246

Source: AHS Finance Revenue.

<sup>a</sup> Includes industry sponsored studies such as pharmaceutical trials

<sup>b</sup> Any Alberta ministry or agency excluding Alberta Health

<sup>c</sup> Donations for research purposes

<sup>d</sup> Interest income held for funding

<sup>e</sup> All other revenues not including those in the other categories

### 4.3.2 Northern Alberta Clinical Trials and Research Centre

In 2013-2014, the Northern Alberta Clinical Trials and Research Centre (NACTRC) approved 542 clinical studies, the most in its history, and \$21.9M in deposits flowed through the organization. The bulk of approvals were for grant-funded studies (36%), followed by studies with no funding (31%) and studies funded by the pharmaceutical industry (21%). Site and area approvals were also at historic highs, totaling 6858 for the year, with a median approval time of 7.0 business days across 348 sites/areas. The majority of research was Phase III, drug-related trials, with considerable volumes of Phase I or II research as well. Outcomes and Chart Review research also figured prominently.

NACTRC returned \$2.1M in overhead to the investigators and supported research in Edmonton with another half million dollars for programs such as the Clinical Investigator Program, summer students, medical records, the coordinator's course, and scientific reviews.



ABOVE: Researcher Jillian Johnson and cancer survivor Diane Franssen.

#### Testing light therapy for cancer survivors

A new research study underway in Calgary is examining whether light therapy will help patients with chronic fatigue who have successfully completed their treatment for cancer. Cancer-related fatigue is reported to be one of the most prevalent and distressing symptoms experienced by cancer patients, and can last for several months or years in up to a third of survivors. Light therapy has long proven beneficial to people suffering the low moods of Seasonal Affective Disorder, or SAD, which can occur in the decreased daylight of fall and winter. In the case of cancer patients, it's thought that light therapy may help reset the body's sleep cycle, which potent chemotherapy agents can sometimes disrupt.

[www.albertahealthservices.ca/9214.asp](http://www.albertahealthservices.ca/9214.asp)

## 5. BUILDING STRONG PARTNERSHIPS IN ALBERTA

Significant health research takes place in Alberta through provincial programs, networks, and research institutes in academic centres and hospital settings which are supported by a variety of national and provincial funding sources. AHS has established partnerships with many of these organizations through collaboration on various research projects, human resources and funding opportunities. The following section highlights the excellent research being conducted in collaboration between these entities and AHS.

### 5.1 Alberta Children's Hospital Research Institute

The Alberta Children's Hospital Research Institute (ACHRI) is a multi-disciplinary partnership among AHS, the University of Calgary and the Alberta Children's Hospital Foundation. ACHRI's research themes support AHS's clinical and service missions for the Alberta Children's Hospital and are synergistic with the SCNs.

Current major initiatives are:

- **Functional Imaging Research:** A 3T MRI scanner acquired in 2012 is being used in ongoing research to understand and treating teen depression, childhood obesity, attention deficit hyperactivity disorder and learning difficulties. As well, the expertise and technology has vastly improved the outcomes for children requiring surgery for epilepsy and brain tumours.
- **Pediatric Brain Injury:** A comprehensive research program is being developed at the University of Calgary to better

understand concussion recovery and promote more effective treatment. The research will build upon an existing foundation of clinical services provided at the pediatric concussion clinic of the Alberta Children's Hospital, the sports concussion clinic in the Faculty of Kinesiology and the adult concussion services at the Foothills Medical Centre.

- **Genomics and Bioinformatics Platform:** In June 2013, the Genomics and Bioinformatics Platform was launched at two sites – the University of Calgary campus and the Alberta Children's Hospital. It is the only facility in Alberta that sequences human DNA and interprets that biological data to generate knowledge for advancements in research and clinical use. Since last year, the facility has sequenced 256 samples of DNA, about half of those human genomes, for researchers in the faculties of medicine, veterinary medicine, kinesiology and science.
- **Alberta Births Common Dataset:** ACHRI researchers have created a dataset collected from thousands of Alberta families—mothers, fathers and children followed from before birth to age three—and researchers are hoping to continue building this information to encompass a twenty year span. The aim is to identify and mitigate mental and physical health risks occurring prenatally and throughout childhood and provide insight into effective prevention and treatment
- **Childhood Cancer Collaborative:** The Childhood Cancer Collaborative is a partnership with ACHRI, AHS and the Southern Alberta Cancer Research Institute. The collaborative is focused on the body's immune system and alternative therapies to fight cancers that have resisted conventional treatments.
- **ACHRI Training Program:** The \$600,000 program supports summer undergraduates, Master's and PhD students, post-doctoral trainees and clinical fellows. ACHRI also supported a research symposium in April 2013. "Toward a Healthy Future" featured speakers both internally and externally and had 110 registered participants.

### Improving CPR education

Front-line health care providers around the world now receive improved training in pediatric life support, thanks to a multi-centre, North America-wide research project led by a physician at Alberta Children's Hospital in Calgary. Each year in North America, about 500,000 health care workers take the Pediatric Advanced Life Support (PALS) course that features emergency simulations on lifelike mannequins. That course is developed by the American Heart Association and offered by the Heart and Stroke Foundation of Canada. Now, the PALS course has incorporated key findings from a 14-site research study that examined the impact of using a scripted debriefing following a simulated pediatric resuscitation.

[www.albertahealthservices.ca/8355.asp](http://www.albertahealthservices.ca/8355.asp)

## 5.2 Alberta Diabetes Institute

The Alberta Diabetes Institute (ADI) is a research facility dedicated to translating discovery science into health solutions for the prevention, treatment and cure of diabetes. The ADI uses a multidisciplinary approach, bringing together leading researchers from diverse fields of expertise in a state-of-the-art facility on the University of Alberta Campus. Many of the members of the ADI are also members of the Diabetes, Obesity and Nutrition SCN.

Research at ADI is divided into five areas with many projects:

- **Immunology:** including mechanisms of tolerance in animal models of transplantation; use of non-human islets for transplantation in animal models of diabetes; and new strategies in preclinical and clinical trials for treating type 1 diabetes patients using beta cell regeneration.
- **Islet Studies:** including mechanisms by which post-translational modification of proteins affect signaling pathways and control islet function and survival; molecular mechanisms of beta cell mass proliferation; and mechanism for metformin-induced insulin sensitivity.
- **Risk and Prevention:** including risk of type 2 diabetes in obese children; understanding genotypes that predict obesity and insulin resistance; launch of the Pure Prairie Eating Plan, a book inspired by the Mediterranean diet but that relies on foods that provide similar benefits for diabetics but are more available locally; relationship between

maternal nutrition before, during and after gestation and infant health; and screening and prevention of diabetes in Metis and First Nations communities in Alberta.

- **Secondary Disease Studies:** including changes in cardiac energy metabolism that occur during diabetes and heart disease; development of clinical practice guidelines for detecting and treating diabetic nephropathy; development of a novel animal model that optimally mimics the visual losses caused by type 2 diabetes in humans; and molecules involved in and novel approaches for treating diabetic neuropathy.
- **Clinical Research and Epidemiology:** including establishment of evidence-based practices regarding bariatric surgeries and patient prioritization which have been adopted by AHS; development of exercise guidelines for diabetes patients; effect of vitamin D supplementation in diabetics; and a systematic review of metformin use in diabetic patients with heart disease, which found that metformin is at least as safe as other glucose-lowering treatments.

### 5.3 Alberta Transplant Institute

The Alberta Transplant Institute (ATI) at the University of Alberta is focused on organ and cell transplantation. It brings together multiple transplant programs (kidney, liver, heart, lung, islet, and others) and strengths under a single umbrella to work towards common goals. These goals are:

- Improving long-term transplant outcomes for Albertans,
- Preventing deaths by making transplantation more accessible to Albertans, and
- Training and attracting the next generation of transplant specialists.

Research highlights of the 2013-14 year include:

- **Canadian National Transplant Research Program (CNTRP):** In April 2013, the CNTRP was launched. This \$25M program, funded by the Canadian Institutes of Health Research and partners, brings together a coalition of more than 100 investigators at 21 institutions from across Canada. The program links researchers in the clinical areas of bone marrow transplantation, solid organ transplantation and donation/critical care. The CNTRP aims to address the burden of chronic diseases by increasing transplant numbers through maximizing donation and by improving long-term transplant outcomes, and encompasses basic biomedical research, clinical investigations, population/cultural research and health systems and policy studies. The CNTRP is led from ATI/University of Alberta, and ATI membership is heavily represented in CNTRP including those serving as leads of several CNTRP projects/cores.
- **Alberta Diabetes-Stem Cell Team:** A grant was received from AIHS- Collaborative Research and Innovation Opportunities grant for a team project on “Restoration of Self-tolerance and Beta Cell Regeneration - Solving the Supply and Survival Problem in Type 1 Diabetes.”
- **Epstein-Barr Infection:** The ATI is leading an AIHS- Collaborative Research and Innovation Opportunities project investigating cytomegalovirus and Epstein-Barr virus infection in transplant patients.
- **Portable Organ Perfusion Technologies:** ATI is collaborating on new projects related to emerging portable organ perfusion technologies for lung, heart and liver. Through a strategic partnership with Transmedics, and ~ \$250K support from ATI, the program has now gone through assessment, training and implementation phases. Eleven ex vivo lung transplants have been performed; all recipients have done well. Long-term sustainability for the program is being sought through AHS.
- **Imaging of Transplant Biology:** A Canada Foundation for Innovation - Leaders Opportunity Fund Infrastructure Grant (2013-18; \$925,135) was used to purchase equipment that will be used to visualize grafts in vivo at the cellular level and to perform high throughput phenotyping of donor and recipient cells.



ABOVE: Karen Hamilton, at home with daughters Emma and Lily, after receiving new lungs that were repaired before transplant using the Ex-Vivo lung perfusion device.

- **Transplantation and Donation Policy in Alberta:** Working together with the Alberta Donates LIFE Coalition and members of the Health Law Institute/ University of Alberta Faculty of Law, the ATI played an important role in supporting the evolution and passage of Bill 207 “Human Tissue and Organ Donation Amendment Act” (December 2013), creating a provincial donation agency and an online registry for organ and tissue donors. The ATI will continue to work on Bill 207 implementation strategies and assessing its impact on donation rates in Alberta.

#### Ex Vivo lung perfusion device offers new hope

More lung transplants could be performed and patient outcomes improved, thanks to a leading- edge device that strengthens and repairs donor lungs prior to surgery. Edmonton is now home to the country’s only portable ex vivo (meaning “outside the body”) lung perfusion device. The device is able to keep donor lungs warm, breathing and nourished while being treated to remove blood clots, a first in transplantation science worldwide. The ex vivo organ perfusion program has been established through a partnership between AHS, the University of Alberta’s Faculty of Medicine & Dentistry’s Alberta Transplant Institute, and the University Hospital Foundation.

[www.albertahealthservices.ca/9820.asp](http://www.albertahealthservices.ca/9820.asp)

## 5.4 Canadian VIGOUR Centre

The Canadian VIGOUR Centre (CVC) is an academic research organization comprised of internationally recognized leaders in cardiovascular medicine and clinical investigation at the University of Alberta. The CVC specializes in managing clinical trials of cardiovascular therapies from study design through to manuscript publication and has a strong partnership with AHS. In addition, the CVC offers research services in the areas of thought leadership, health economics, biostatistics, clinical trials monitoring, processing and analysis of electrocardiographic data and financial management.

Highlights of 2013 include:

- **Publications:** 54 publications resulting from CVC’s body of research, 146 principal investigators participating in CVC-managed trials, 9 industry and grant-funded projects currently underway,
- **Clinical Trials:** Involvement in eight Phase III clinical trials, two grant-funded trials, and in the initial planning and negotiations for one Phase II clinical trial. Many of these trials are in collaboration with other sites across Canada, and
- **Acute Coronary Syndrome Symposium:** Hosting the 19th annual symposium “New Concepts in Acute Coronary Syndromes: Beyond 2000,” held in Montreal in conjunction with the Canadian Cardiovascular Society and Congress and supported by an unrestricted educational grant from AstraZeneca in October 2013.

## 5.5 Health Research Collaborative – Red Deer College

The Health Research Collaborative is an applied research initiative between AHS and Red Deer College. Its goal is to achieve excellence in collaborative applied research that effectively addresses health issues, improves health outcomes and builds capacity for evidence-informed planning and decision making.

This past year, the Health Research Collaborative supported nine projects that engaged 38 health practitioners, decision makers and community stakeholders, 19 academics and six post-secondary students on collaborative teams:

- Aboriginal Women and Community Perspectives of the Wetaskiwin and Area Primary Care Network Prenatal Program



ABOVE: Muskaan Grewal, who for a period was the world’s youngest person with an artificial heart, is pictured here after her heart transplant at Stollery Children’s Hospital. Her medical team included, from left: Dr. Ivan Rebeyka, Chief of Pediatric Cardiac Surgery; Dr. Holger Buchholz, Director, Pediatric Artificial Heart Program; and Selvi Sinnadurai, Edmonton VAD Program Co-ordinator.

- Measuring Primary Care Network Health Team Effectiveness
- The Impact of a Dementia Simulation on Attitudes Towards Aging and Dementia in Professional Care Providers, Family Members, and Students
- Evaluation of the Children's Rehabilitation Services Navigation Initiative
- Patient Reported Outcome Measures and Secondary Data Analysis to Demonstrate Value in Primary Care
- Assessing Return on Investment in Primary Care Network Programs
- Primary Care Network Measurement Capacity Initiative: Developing Common Quality and Outcome Indicators
- My Home Health: A Virtual Care Management Pilot Program for Self-Management of Congestive Heart Failure
- Community-Based Storytelling to Identify Wise Practice and Gaps Needed to Address the Aboriginal HIV/AIDS Epidemic

The 2013/14 projects have provided key information to improve, sustain and assess the impact of programs and services on the health issues in the community.

#### Youngest patient with artificial heart receives transplant

A six-year-old girl has received a heart transplant 10 months after becoming the youngest patient in North America to have a revolutionary heart pump surgically implanted inside her chest at the Stollery Children's Hospital. In September 2012, the girl received a HeartWare Ventricular Assist Device (VAD) that took over the pumping function of her heart. The VAD, roughly the size of a golf ball, was designed for adults, but has been used in a small number of pediatric cases around the globe. The device allowed the girl and her family to return home until a heart became available for transplant.

[www.albertahealthservices.ca/8884.asp](http://www.albertahealthservices.ca/8884.asp)

## 5.6 Institute for Reconstructive Sciences in Medicine

The Institute for Reconstructive Sciences in Medicine (iRSM) is an internationally recognized clinical and research institute focused on medical reconstructive sciences. The iRSM is a joint initiative of the University of Alberta, Covenant Health and AHS, based at the Misericordia Hospital in Edmonton.

Highlights for the 2103-2014 year include:

- **Projects:** Ongoing research into multidimensional modeling of the head and neck and non-destructive testing of implants,
- **Research Funding:** Receipt of a total of \$3.1M in new operating grants to fund research on mobile health solutions for swallowing impairments, implantable bone conduction hearing aids and regenerative medicine. Most of this funding came from the Alberta Cancer Foundation, the Canadian Institutes of Health Research and the Oticon Foundation, and
- **Publications and Trainees:** 33 peer-reviewed publications, 29 invited presentations and 37 peer-reviewed presentations, and 17 trainees.

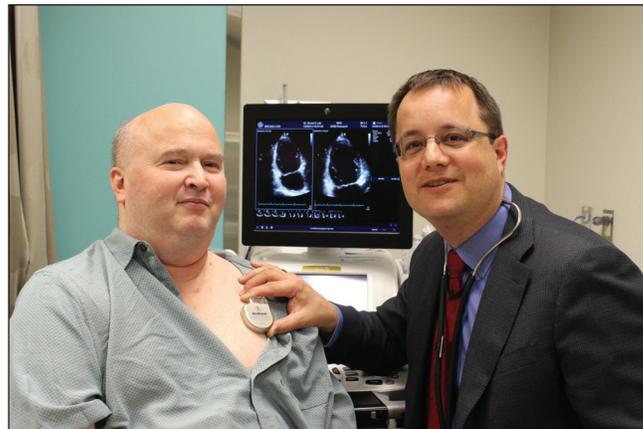
## 5.7 Libin Cardiovascular Institute of Alberta

The Libin Cardiovascular Institute is an entity of the AHS-Calgary Zone and the University of Calgary that manages and coordinates cardiovascular research, education and patient care in Calgary. It also works cooperatively with the Cardiovascular Health and Stroke SCN, with many members actively involved in both groups. The Institute celebrated its

10th Anniversary in January 2014.

Research highlights for the year include:

- **Libin Institute Analysis Centre (LIAC):** The LIAC was established this year. LIAC manages health information and helps researchers based on need, whether it is helping to identify the appropriate statistical method for a research project, produce and interpret statistical reports, or create tables and figures that best represent the analyses. This has helped improve the productivity of the Institute members.
- **Projects:** The foundational research priorities are Heart Health Services, Electrophysiology, and Sudden Cardiac Death. Two emerging priorities are vascular dynamics and advanced heart failure. Imaging is a cross-sectional priority for the Institute through the Stephenson Cardiac Imaging Centre. The Institute also provides leadership to the Alberta Provincial Project for Outcome Assessment in Coronary Heart Disease (APPROACH) project.
- **Research Funding:** \$20M in funding in the past year (up to April 2013).
- **Publications:** 358 manuscripts, up from 280 for the previous year. Of those 358 manuscripts, 32 were published in journals with impact factors above 10.



ABOVE: Cardiologist Dr. Derek Exner places an implantable cardioverter defibrillator on the chest of Gordon Skidmore, who had a similar device implanted following a heart attack in 2011.

#### Researchers consider reach of life-saving technology

Research aimed at saving the lives of more cardiac patients has expanded to include three additional AHS sites, as well as other locations in Canada and internationally. Researchers at the University of Calgary-AHS Libin Cardiovascular Institute of Alberta are hoping to enhance the guidelines used to determine who should receive an implantable cardioverter defibrillator or ICD. An ICD is a device implanted under the skin that monitors heart rhythm and automatically corrects life-threatening heart rhythm abnormalities.

[www.albertahealthservices.ca/9145.asp](http://www.albertahealthservices.ca/9145.asp)

## 5.8 Mazankowski Alberta Heart Institute

Serving both adults and children, the Mazankowski Alberta Heart Institute in Edmonton is affiliated with the University of Alberta and AHS. This state of the art facility is the only one of its kind in western Canada, treating patients from across Alberta, North West Territories and parts of British Columbia and Saskatchewan. The Heart Institute services patients across the complete continuum of care from diagnostics through to cardiac rehabilitation. The facility supports a robust transplant program and is one of the busiest heart transplant centres in western Canada. The Heart Institute strongly supports cardiovascular research through two research centres: the Alberta Cardiovascular and Stroke Research Centre (ABACUS) and the Cardiovascular Research Centre (CVRC).

### Study identifies cardiovascular risks in people with diabetes

A team from the University of Alberta and the Mazankowski Alberta Heart Institute is investigating whether a novel imaging method can identify diabetic patients at risk of suffering a cardiovascular event. The investigators will use PET-CT scanning to find arterial plaques that might be prone to fracture and might cause either a heart attack or stroke in diabetic patients. CT scanning is used to identify vascular calcification, a marker of atherosclerosis, and PET imaging is used to determine whether the plaque is actively growing. The results might improve the management and the outcome of a large number of patients affected by diabetes.

## 5.9 McCaig Institute for Bone and Joint Health

The McCaig Institute for Bone and Joint Health at the University of Calgary is a centre of excellence for musculoskeletal health research. Utilizing multi-disciplinary teams, including engineers, basic scientists and clinicians, allows the Institute to address complex, multi-faceted problems and develop innovative solutions. With a focus on the three most common bone and joint disorders – osteoarthritis, osteoporosis and rheumatoid arthritis – as well as joint injury, members of the Institute study a range of areas from prevention to improving early diagnostics, treatments, and healthcare delivery.

Research highlights for the year include:

- **Biomarkers for Osteoarthritis:** A breakthrough discovery will allow a diagnosis of osteoarthritis to be made by studying the profiles of biomarkers found in the synovial fluid in the joints or blood before any symptoms are present. The methodology is 90% accurate and can discriminate between early and late stage osteoarthritis and patients who are healthy or have rheumatoid arthritis; and
- **Mobility and Joint Health Facility:** This new \$17.9M clinical research facility will become the future of bone and joint health research. The facility will leverage partnerships with the AHS Bone and Joint Health SCN, who will inform the research conducted in the facility to ensure that clinically relevant problems are being addressed. Through partnership with the Alberta Bone and Joint Health Institute, the Institute will also be able to evaluate how effective the solutions are in terms of measures like cost and patient outcomes. Research in the facility will focus on developing new tools and innovations to diagnosis osteoarthritis, rheumatoid arthritis and osteoporosis at their earliest stages, allowing researchers to develop personalized-medicine approaches for treatments.

## 5.10 O'Brien Institute for Public Health

The mission of the O'Brien Institute for Public Health at the University of Calgary is to catalyze excellence in population health and health services research, to the benefit of local, national, and global communities. It has three primary areas of focus which are exemplified by flagship programs:

1. Enhanced health systems performance; flagship, the Ward of the 21st Century (see section 5.11),
2. Improved population health; flagship, the Population Health and Inequities Research Centre, and
3. Innovative tools and methods for public health; flagship, the International Methodology Consortium for Coded Health Information.

AHS leaders contribute to the Institute's governance structure and working committees, and approximately one third of IPH members are AHS employees.

Institute for Public Health accomplishments for the 2013-2014 year include:

- Increasing success of members in securing prestigious external research funding;
- Notable outputs from members' research activities (publications, media interactions, policy influence);
- A very favourable first review from an International Strategic Advisory Group;
- Continuation of IPH's role in Campus Alberta Health Outcomes and Public Health, which encourages collaboration among Alberta's health services and population health researchers and research users in academic, AHS, and government roles; and

- The launch of an auspicious partnership with the City of Calgary and the University's Faculty of Environmental Design, on healthy urban design and planning.

#### Patients trained to do AHS research

A joint initiative between AHS and the O'Brien Institute for Public Health at the University of Calgary trains patients and former patients in formal research methods. Once they graduate from the Patient and Community Engagement Research (PACER) program, these volunteers join AHS' Strategic Clinical Networks in order to determine how the health system can deliver high-quality, patient-centered care.

[www.albertahealthservices.ca/9376.asp](http://www.albertahealthservices.ca/9376.asp)

## 5.11 Ward of the 21<sup>st</sup> Century

Ward of the 21<sup>st</sup> Century (W21C) is a not-for-profit research and innovation initiative of the University of Calgary and AHS. W21C comprises a multidisciplinary team of experts and collaborative space and infrastructure including the W21C Living Laboratory in Unit 36 at the Foothills Medical Centre in Calgary and the W21C Research & Innovation Centre in the Teaching, Research, and Wellness Building at the Faculty of Medicine, University of Calgary. Both spaces enable W21C to develop, test and showcase innovations within the health system. This past year has been particularly successful for W21C, with over 30 projects underway. Highlights include:

- **Interdisciplinary Research and Innovation for Health System Quality and Safety:** This 5-year AHS-Collaborative Research and Innovation Opportunities grant, which started in March 2013, involves four main project areas, all with links to AHS. These include:
  1. Testing the efficacy of a pressure-sensing hospital mattress system, which has the potential to reduce the risk of pressure ulcers in patients and lead to shorter and safer stays and increased hospital capacity,
  2. The development and implementation of a decision-support tool to aid physicians when diagnosing pulmonary embolism, a common and lethal condition,
  3. The development of a tool to enhance care as patients are transferred through different sectors of the health care system, leading to safer continuity of care and increasing health care system capacity, and
  4. A multi-dimensional evaluation of AHS' SCN initiative to help SCNs work more efficiently, increasing the quality, safety and capacity of care for all Albertans.
- **Seamless Transition of Care Project:** The transition between acute care and community care is a vulnerable period in health care delivery. W21C worked with a Calgary-based company and AHS to develop and integrate an electronic communication transfer-of-care tool. In December 2013, W21C completed recruitment for a 1400 patient randomized controlled trial to test the tool, which is one of the largest e-health trials to date. The tool is now used throughout Calgary adult hospitals.
- **AHS Emergency Medical Services (EMS) Ambulance Design Human Factors Evaluation Project:** This study is a collaboration between W21C and AHS-Emergency Medical Services, with funding provided by AHS, W21C, and AUTO21 Network of Centres of Excellence that has been ongoing since 2012. EMS providers throughout the province (n=792) were involved in either online surveys or simulated care scenarios. Data collection was completed in May 2013. Study results inform the development of evidence-based ambulance design guidelines and offer new insights into the interaction between ambulance design, care delivery, and EMS provider safety.

## 5.12 Women and Children's Health Research Institute

The Women and Children's Health Research Institute (WCHRI) was founded in 2006 as a partnership between AHS and the University of Alberta, with core funding from the Stollery Children's Hospital Foundation and the Royal Alexandra Hospital Foundation. WCHRI supports transdisciplinary research through its approximately 350 members, who are

leading researchers, clinician-scientists, academics, health care professionals and service providers from academic and community settings. WCHRI provides direct research support, competitive grant competitions, support platforms, physical infrastructure, professional development, and training and networking opportunities.

Research and granting initiatives in 2013 included:

- Almost \$3 million in grants were awarded during 2013 with the largest program being a peer-reviewed Innovation grants competition (\$900,000) to support new, cutting-edge research ideas;
- WCHRI research grants were leveraged by members, who were awarded over \$26 million in external funding last year, with most of these over multiple years;
- Over 800 papers were published in 2013 by WCHRI members;
- Trainee support was provided (\$475,000), including funding for undergraduate and graduate students and clinical resident researchers;
- A Support Platform for Integrated Research (SPIR) was formed in 2013 to provide a coordinated platform to incent, facilitate, and support clinical and health outcomes research excellence related to women and children; and
- A Research Day was coordinated, with over 400 attendees and 180 abstracts presented in research areas focused on complex diseases of childhood, women's health and complicated pregnancy outcomes.

Active research by WCHRI members on sites within AHS facilities supports collaboration between research and clinical staff, which facilitates richer research and translation of research into clinical care. The partnership with AHS fosters a culture of research whereby WCHRI members can access patients and gather the data they need to advance health care through research and allows for leveraging of new national and provincial initiatives, including the SCNs.

## 5.13 Alberta Clinical Research Consortium

The Alberta Clinical Research Consortium (ACRC) is a collaboration among AHS, AIHS, Covenant Health, the College of Physicians & Surgeons of Alberta, the University of Alberta and the University of Calgary. The ACRC has a vision of “high quality, integrated, and efficient clinical research for Alberta” and aims to improve access to clinical research, assist with better utilization of resources, and ensure a vibrant clinical research environment.

In this last year, ACRC's partner organizations have:

- Built upon the single roadmap agreed upon by the partner organizations which outlines the required research processes from study start to close,
- Produced a common, provincial terminology and a glossary that promotes consistent definitions and use of terms,
- Provided provincially accessible, Health Canada-compliant online training through CITI-Canada, with courses in Good Clinical Practice, Research Ethics, and Responsible Conduct of Research and Transportation of Dangerous Goods,
- Created a researcher toolbox that assists investigators in developing and conducting studies, including a protocol template, internal costing template, standard operating procedures, and laboratory manual, and
- Developed an online one-point-of-entry, one-stop shop that will guide researchers through clinical research administrative processes and facilitate communication between departments and organizations.

The ACRC continues to engage nationally with other provinces and initiatives on improving access and enhancing a robust clinical research environment in Alberta.

In this last year, ACRC's partner organizations participated in the Health Research Ethics Harmonization initiative (see section 7.2). As well, the partner organizations developed a number of tools to support researchers that will be implemented in the upcoming year. One of the tools is an internal costing template, which assists researchers in itemizing the costs of conducting a trial.

The ACRC continues to engage nationally with other provinces and on initiatives for improving access and enhancing a robust clinical research environment in Alberta.



ABOVE: Orthopedic surgeon Dr. Kevin Hildebrand measures the range of motion in Grace Selinger's elbow. Selinger is part of a research study seeking to determine if an asthma drug called Ketotifen will help prevent the debilitating joint stiffness that can develop after an elbow injury.

## 5.14 SPOR SUPPORT Unit

Alberta's Strategy for Patient Oriented Research (SPOR) Support for People and Patient Oriented Research and Trials (SUPPORT) Unit was officially launched by the federal and provincial ministers of Health late last fall. The Unit is jointly funded for five years by the Canadian Institutes of Health Research and AIHS and is overseen by a steering committee made up of representatives from AHS, University of Alberta, University of Calgary, University of Lethbridge, Academic Health Network, Alberta Health and AIHS.

The Unit is a virtual services and resources hub formed around seven core support themes or platforms:

1. Data Platforms and Service
2. Methods Support and Development
3. Health Systems Research, Implementation Research and Knowledge Translation
4. Pragmatic Clinical Trials
5. Career Development in Methods and Health Services Research
6. Consultation and Research Services
7. Patient Engagement

Platform Leads were recruited in the summer of 2014 and were announced in the fall. These Leads will have the responsibility of developing platform capacity so that any researcher working in patient-oriented research in Alberta can reach out and access support in one or more of the core areas. Criteria for eligibility for Platform support is being developed. The partners and Alberta SPOR SUPPORT Unit leadership are also working on a sustainability model so that the Unit can exist beyond the five years of its initial funding.

Alberta's SPOR SUPPORT Unit's funding is earmarked for the development of these seven platforms. The goal is that the broad platform development and service offerings approach will enable provincial researchers to be even more competitive on a national and international scale and increase the quantity and quality of patient outcomes research in Alberta.

### Using asthma drug to treat elbow stiffness after injury

A new research study is trying to find out if a drug commonly used to treat asthma can prevent debilitating joint stiffness that sometimes develops after an elbow injury. Loss of range of motion in the elbow can make everyday tasks like eating and dressing extremely difficult. Early research by AHS and the University of Calgary indicates an asthma drug, called Ketotifen, helps limit the body's release of a biochemical growth factor that causes the joint to stiffen.

[www.albertahealthservices.ca/9362.asp](http://www.albertahealthservices.ca/9362.asp) and [page 2 of www.albertahealthservices.ca/Zones/ahs-zone-print-calgary-2014-02.pdf](http://www.albertahealthservices.ca/Zones/ahs-zone-print-calgary-2014-02.pdf)

## 6. INCENTING RESEARCH OF THE HIGHEST VALUE TO AHS

AHS continues to look for approaches that recognize and encourage research and innovation by health professionals at all levels and care settings. AHS funds and/or administers a variety of awards to recognize and support outstanding research relevant to the health care system.

### 6.1 Alberta Partnership for Research and Innovation in the Health System

Last year, AHS and AIHS established a funding program to support high impact research activities within the SCNs that align with the priorities of AHS and the Province: the Alberta Partnership for Research and Innovation in the Health System (PRIHS). The following criteria are used to identify proposals of the highest quality:

- **Significance and feasibility:** The research program is applicable and addresses prevalent and important issues in the health system and AHS;
- **Scientific merit and environment:** The proposed research activities are based on well delineated health questions/issues and define a set of evidence-based deliverables. The environment/framework described for the proposed research will contribute positively to the achievement of deliverables;
- **Value for money and impacts:** The research program demonstrates relevance (alignment with identified priorities as defined by AHRIS, AHS Health Plan and the SCNs) and performance (effectiveness, efficiency and economy), with a particular focus on measuring cost-savings to the health system;
- **Capacity building:** The research program contributes to building capacity in the health system for the adoption, uptake, and use of resultant knowledge through meaningful engagement of key knowledge- and/or end-users in the proposed research activities to support success of the intended impact;
- **Quality improvement:** The research program addresses improvement in one or more of the six dimensions of quality in health.

For the first PRIHS competition, 10 PRIHS awards were approved with a start date of January 1, 2014. This represents a total investment of just under \$7.5M over the next three years. Awards were given to:

1. Bone and Joint Health SCN, Optimizing Centralized Intake to Improve Arthritis Care for Albertans
2. Bone and Joint Health SCN, SpineAccess Alberta: An Innovative Health Service Delivery and Spine Management Model
3. Cancer SCN, Rectal Cancer Care Clinical Pathway
4. Cardiovascular Health and Stroke SCN, Efficient /Effective Delivery & Follow-up of Cardiovascular Implantable Electrical Devices in Alberta: Performance Evaluation & Rhythm Follow-up Optimization with Remote Monitoring (PERFORM) Collaborative Project
5. Critical Care SCN, Identifying and Evaluating Intensive Care Unit Capacity Strain in Alberta
6. Critical Care SCN, Reassessing Practices in the Daily Care of Critically Ill Patients: Building Capacity and Methodology to Identify & Close Evidence-care Gaps
7. Diabetes, Obesity and Nutrition SCN, Care and Rehabilitation for Patients with Severe Obesity in Alberta's Tertiary Care Settings
8. Emergency SCN, Improving the Stewardship of Diagnostic Imaging Resources in Alberta Emergency Department
9. Seniors Health SCN, Optimizing Seniors Surgical Care - The Elder Friendly Surgical Unit
10. Surgery SCN, Enhancing Patients' Recovery After Surgery (ERAS): Strategy to Transform Care and Maximize Value

## 6.2 Central Zone Research Grants

Three Seed Funding Grants were awarded this year through AHS' Central Zone Research Office. This year, the successful applicants were:

- Jean Anne Nichols for "Kentwood place tenant description and needs by estimated length of stay;"
- Dr. Deena L. Hinshaw for "Influenza A H5N1 serology study; and
- Angela Erza for "Program evaluation of clinical outcomes associated with bariatric surgery at the Red Deer Bariatric Specialty Clinic"

### AHS clinic helps children with clubfoot

Parents of babies born with the deformity of the foot and ankle known as clubfoot can now access a new clinic to correct the condition without major surgery or likelihood of relapse. The new Clubfoot Clinic in the Stollery Children's Hospital offers a program to correct the condition, which affects about 50 babies in Edmonton every year. Clubfoot affects the muscles, ligaments, bones and joints of the developing foot and ankle, causing one or both feet to curl in and down. At the Clubfoot Clinic, rehabilitation specialists use the Ponseti Method, which has been shown globally to reduce the need for invasive surgical correction in the treatment of clubfoot.

[www.albertahealthservices.ca/9016.asp](http://www.albertahealthservices.ca/9016.asp)

## 6.3 MedStar Awards

AHS sponsors the University of Alberta's MedStar awards, which are given by the Faculty of Medicine and Dentistry. In 2013/14, six awards were given.

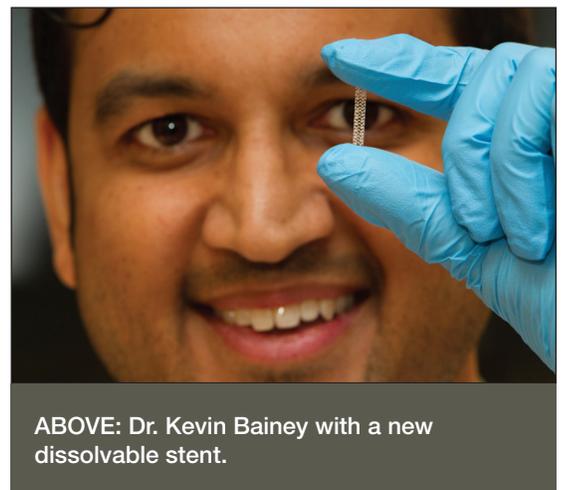
- David Van de Vosse (graduate student) studied how large protein channels ("gateways") that regulate transport in and out of the cell's nucleus) define the organization of chromosomes and control which genes are expressed.
- Georg Schmolzer (postdoctoral fellow) reviewed all available studies to identify if breathing assistance without ventilation in premature babies reduces chronic lung disease, often caused by ventilation after birth.
- Ratnadeep Basu (graduate student) found that a protein known as TIMP3 inhibits enzymes in the arterial walls that impair the body's ability to maintain normal blood pressure and respond to blood pressure-normalizing drugs.
- Matthew Schellenberg and Tao Wu (postdoctoral fellows) identified components of the spliceosome, a molecular machine that removes pieces of "unwanted" RNA from mRNA.
- Lucas Cairo (graduate student) found that cellular machinery normally involved in regulating aspects of chromosome segregation also functions to regulate the movement of specific molecules into the nucleus.
- Jihong Lian (postdoctoral fellow) blocked a protein (Ces3/TGH) in the liver that normally secretes lipid into the blood and found that treated animals did not show the usual disease symptoms of a high fat diet.

## 6.4 Glenrose Rehabilitation Hospital

The Glenrose Rehabilitation Hospital in Edmonton has a Rehabilitation Research and Technology Development Group that actively promotes, develops and supports researchers. The innovation strategy at the Glenrose is based on three legs: closer links with the academic world, building on the expertise of our clinical staff and working more effectively with industry. The Group has over 200 researchers, 500 active studies, 80 publications and 170 presentations, and \$9M in external funding in partnership with academic affiliates and the Glenrose Hospital Foundation.

Significant achievements in the past year include:

- **Annual Rehabilitation Research Awards:** With the support of the Glenrose Hospital Foundation, a total of \$50,000 was awarded to support five rehabilitation research proposals. Successful projects varied from autism to robotics to sensory feedback research.
- **Reverse Trade Show:** At the Reverse Trade Show, clinicians present a range of clinical problems that do not have effective solutions in the market to an audience consisting of commercial enterprises, government representatives, academics and students. The goal is to have a solution developed for the problem that meets the clinical need but also is commercially viable. This past year marked the successful commercialization of a touch screen upper



ABOVE: Dr. Kevin Bainey with a new dissolvable stent.

extremity therapy product (called Retouch) by Rehabtronics, an idea presented at the Reverse Trade Show.

- **Technology Forums:** The Technology Forum series uses video-conferencing technology to highlight developments on the verge of commercialization or are based on novel concepts. Speakers from 2013/14 included: Dr. Ann Spungen who spoke about advances in exoskeletons and Dr. Christos Giachristis who spoke about information and communication technology systems for rehabilitating stroke patients and monitoring dementia patients.

#### First bio-absorbable stents in Western Canada

The Mazankowski Heart Institute is the first medical centre in western Canada to use bioabsorbable stents. A typical stent is a tiny wire mesh tube made of metal that is inserted into a clogged artery, opening it and improving blood flow. The new bioabsorbable stent is made of a material that gradually dissolves over one or two years, leaving a strengthened artery that can stay open on its own. For younger patients (under 65), this means that a metal stent is not left behind, making it easier if future treatment should be required. This technology was made available on a special-access basis authorized by Health Canada.

[www.albertahealthservices.ca/8390.asp](http://www.albertahealthservices.ca/8390.asp)

## 7. BEING EFFICIENT WITH AHS RESOURCES

AHS is committed to directing its resources in ways to maximize research gain. A key strategy is to develop policies and procedures that streamline the research process and minimize the “red tape” involved in integrating and accessing AHS data, getting ethical approval for a research proposal and protecting intellectual property.

### 7.1 AHS Data Repository for Reporting

The AHS Data Repository for Reporting (AHSDRR) is a centralized repository of administrative datasets which are generated from the ongoing delivery of health care; e.g., hospital discharge records, ambulatory care visits, etc. These datasets are used by dozens of analytical teams across the province to support a wide range of performance measurement, reporting, planning and decision-making needs. This year, improvements were made to privacy policies, dataset content and access for the AHSDRR:

- An updated Privacy Impact Assessment was submitted to the Office of the Information and Privacy Commissioner of Alberta. This detailed conditions under which external AHS users (e.g., primary care networks, researchers, Alberta Health) can access data directly from the repository.
- Data analysts collaborated to enhance the metadata associated with AHSDRR datasets. Metadata are details about the contents and context of the various datasets so that analysts know how to use the data properly. The enhancements allow the metadata to be viewed directly in-line with the physical database tables and columns themselves.



ABOVE: Critical care specialist Dr. Daniel Niven demonstrates how a temperature reading is taken with a temporal artery thermometer.

- AHS analysts were provided with direct access to select Alberta Health datasets, which has enabled a more holistic view of the health system, reduced data storage, and allowed simplification of the Extract/Transfer/Load process.

### **Fever rates decline in ICUs**

A rule of thumb in Intensive Care Units (ICUs) has traditionally been that 50% of the patients will have a fever at any given time. Researchers looked at the incidence of fever in Calgary ICUs over a five-year period and discovered a dramatic and mystifying drop in that number. Now only 25% of patients in ICUs have fever. A small part of the drop can be attributed to a change in the type of thermometer used, but researchers can only speculate on other possible explanations. Increased effectiveness in infection prevention strategies could be one reason, or it may be that the types of bacteria in circulation are less severe.

[www.albertahealthservices.ca/9188.asp](http://www.albertahealthservices.ca/9188.asp)

## **7.2 Health Research Ethics Harmonization Initiative**

AHS is a member of the Health Research Ethics Harmonization initiative, which aims to make the process of ethics review for human research transparent and consistent among all the research ethics boards in Alberta. The goal is to have one coordinated ethics review system in the province and to have agreements in place for reciprocity, governance and data-sharing among the research ethics boards. The past year has seen significant accomplishments for the Health Research Ethics Harmonization initiative:

1. **Health Research Ethics Board of Alberta (HREBA):** The HREBA brings together three research ethics boards: the Community Research Ethics Board of Alberta (AIHS), the Alberta Cancer Research Ethics Committee (AHS) and the Research Ethics Review Committee (physicians). These formerly independent research boards are now committees within the unified HREBA. As a consequence, the number of research ethics boards in Alberta has officially been reduced from six to three under the province's Health Information Act: the new HREBA located at AIHS, the Health Research Ethics Board located at the University of Alberta, and the Conjoint Health Research Ethics Board located at the University of Calgary.
2. **Electronic platforms:** The HREBA's committees were transitioned to an electronic platform (Institutional Research Information Service Solution – IRISS) for submitting, reviewing and managing ethics applications. IRISS is also used by the University of Calgary's Conjoint Health Research Ethics Board, whereas the University of Alberta's Health Research Ethics Board uses another platform (Research Ethics and Management Online system – REMO). Moving from a paper-based system to an electronic one that uses a common application and reporting template will decrease the workload for both researchers and administrators.
3. **Legal agreements:** The following agreements were executed:
  - The Reciprocity Agreement allows researchers whose research falls under the jurisdiction of more than one research ethics board to have the approval of the first board fully recognized and accepted by the other boards,
  - The Data Sharing Agreement provides for key data elements from the IRISS and REMO platforms to be extracted for a provincial ethics reporting system, and
  - The Governance Agreement provides the ongoing framework for the future governance of health research ethics harmonization in Alberta.

All parties have committed resources and expertise to implement the agreements, which will be accomplished in the next fiscal year.

4. **Provincial Health Research Ethics Information System (PHREIS):** PHREIS receives administrative data from the two on-line platforms (IRISS and REMO), which are then analyzed on behalf of the research ethics boards. This will provide the ability to measure and monitor the outcomes as identified in Alberta's Health Research and Innovation Strategy.
5. **Satisfaction surveys:** Researchers and staff were surveyed to identify aspects of the research ethics system that

are working well and where there is need for improvement. The survey will be repeated at regular intervals to assess progress in enhancing researcher and staff satisfaction with the ethics review processes.

## 7.3 Intellectual Property

In 2011, AHS created an Intellectual Property (IP) policy that details the disclosure, ownership, transfer, commercialization and revenue sharing of IP developed at AHS. The Vice-President of Research, Innovation and Analytics (or designate) is responsible for the administration of IP in accordance with this policy.

- There were 20 new reports of inventions or IP disclosures submitted during this past fiscal year. These have been assessed with advice on how to proceed with commercialization and IP protection where necessary.
- Seven major IP due diligence matters were processed as per the IP Policy to assess ownership issues and governance associated with legacy technologies or joint ventures of the previous health authorities before AHS was formed.
- Specific to the LINAC-Magnetic Resonance project, four applications were filed and three patents were issued between April 1, 2013 and March 31, 2014.

### **Asthma service reduces hospitalizations**

Children with asthma are breathing a little easier thanks to an AHS program in Calgary that has greatly reduced their need for emergency care and hospitalization. The Community Pediatric Asthma Service, believed to be the first of its kind in Canada (launched in 2005), invites patients and their families to one-hour sessions with certified respiratory educators, who share information about asthma diagnosis, triggers, medication and devices. The educators also develop personalized 'action plans' to help each family keep asthma under control. This means patients with less severe asthma can be put directly into the care of community health providers, rather than visiting the specialty clinic at the Alberta Children's Hospital.

[www.albertahealthservices.ca/7910.asp](http://www.albertahealthservices.ca/7910.asp)

## 7.4 Shared Data Model

In 2013/14, AHS completed two Shared Data Model pilot projects, where the goal was to drive clinical performance improvement by connecting clinician-led teams and their localized databases to the administrative datasets housed within the AHS Data Repository for Reporting (see section 7.1).

Projects with Cardiac Sciences and Neurosciences departments of AHS were undertaken, and both achieved their analytical goals. With the former, patients were shown to have better outcomes in terms of mortality and readmission to hospital following a certain procedure. With the latter, patients' length of stay in hospital was shorter when a specific type of monitoring was in place.

As value was demonstrated from these pilot projects in combining clinical and administrative datasets, additional Shared Data Model projects are already underway and more are planned for the future.

## 8. BEING EFFECTIVE WITH AHS RESOURCES

AHS is committed to being effective with its resources to achieve high quality research that will improve the health of Albertans. To that end, it has established teams that provide services to researchers and research groups, such as the SCNs. These teams provide training opportunities, support researchers by providing methodological and management services, make searching and finding knowledge easier and provide information on new and emerging health technologies.

## 8.1 Providing Training Opportunities

The Engagement, Education, and Capacity team of AHS's Research Priorities and Implementation Department organizes formal educational opportunities to increase research capacity within AHS. The following courses were offered this year:

- **Health Research Methods Course:** AHS has partnered with the University of Calgary Faculty of Medicine, the Continuing Medical Education Office and AIHS to offer an accredited Health Research Methods course on an annual basis. Building on a topic of personal interest, the course provides physicians and other healthcare professionals an introduction to methods for undertaking health research while learning principles of research study design, practical aspects and innovation in research, and communication and dissemination of research. In order to extend its reach provincially, the Health Research Methods course was successfully piloted as a 12-week online program this year.
- **Biostatistics Workshop:** AHS has partnered with the University of Calgary Faculty of Medicine and the Continuing Medical Education Office to offer an accredited Biostatistics Workshop. This annual, one-day workshop helps physicians and other healthcare professionals understand the conceptual basis of statistics, learn the advantages and disadvantages of common statistical methods, and run and interpret basic descriptive and inferential statistics in a computer lab.
- **CITI-Canada:** AHS also provides training opportunities through Collaborative Institutional Training Initiative (CITI)-Canada, which offers courses via the N2 Network of Networks organization, of which AHS is a member.
- **Northern Alberta Clinical Trials and Research Centre (NACTRC):** NACTRC sponsors a two-day intensive training program conducted by Weiser Research, Inc. for Canadian study coordinators to enhance their skill set and knowledge base of clinical trial research. There were 27 participants in June 2013 and 31 participants in February 2014.



ABOVE: Paramedics Brian Hall, left, and Evan Yaceyko flank Patric Ogle, holding a picture of his wife Debbie.

### Bringing palliative care to the home

In 2013 the Edmonton Zone launched the “palliative care and treat in place” program to enable emergency medical services, continuing care and family physicians to collaborate in palliative care to patients at home, reducing the need for emergency department admissions. Many patients with end-of- life issues require some clinical treatment to remain comfortable in their own homes during their final days. Prior to the launch of the program, palliative patients in crisis would be transported to an emergency department to receive care, creating an often unnecessary disruption for patients and their families. Now, paramedics work with home care professionals and family physicians to provide palliative support while the patient remains at home, or assist with a transfer to the emergency department if required (see page 2).

[www.albertahealthservices.ca/Zones/ahs-zone-print-edmonton-2013-11.pdf](http://www.albertahealthservices.ca/Zones/ahs-zone-print-edmonton-2013-11.pdf)

## 8.2 Supporting Research

### 8.2.1 Methods and Statistics

The Research Facilitation team of AHS provides methods and statistical support to priority research projects in AHS, particularly for the SCNs. The types of support include methodological design, biostatistics, health economics, specification of data requirements and data analysis. Proposed additional areas of support include budget development and literature searches.

This year, the team assisted in numerous grant submissions by the SCNs and other AHS researchers, and it provided analytic support and oversight to the analysis of high priority research projects within AHS.

Research Facilitation also provided statistical consultation and analysis to 55 initiatives and projects for 10 SCNs. These projects included:

- The Enhanced Recovery after Surgery (ERAS) initiative,
- Evaluation of overcapacity protocols in emergency departments,
- Assessment of new care pathways for chronic obstructive pulmonary disease,
- Study developing appropriateness decision tools for hip and knee arthroplasty,
- Study assessing treatment for metastatic cervical cancer,
- Evaluation of comfort rounds for elderly patients, and
- Study developing a new services delivery models for spine care.

In addition, the Research Facilitation team assisted in the submission of grant proposals to the Canadian Institutes of Health Research, and to AIHS by seven of the SCNs.

#### **Creating triage centres for back pain**

The Bone and Joint Health Strategic Clinical Network's "Spine Access Alberta" project will focus on early team triage to reduce back pain in most patients while improving access for those few patients who need specialist consultations and imaging. The project will create centres where multidisciplinary health care teams will assess and triage care for patients with back problems. Immediate care and education will be provided to the majority of those with back pain who do not require surgery. This will help clear the health system of the back log of patients waiting for unnecessary procedures and help those who need to see specialists faster.

[www.aihealthsolutions.ca/news-and-events/media-centre/6578/](http://www.aihealthsolutions.ca/news-and-events/media-centre/6578/)

### **8.2.2 Project Management**

The Clinical Project Support Services team of AHS focuses on strengthening the adoption of industry standard project management methodologies for SCN research projects. Clinical Project Support Services-supported projects currently underway include the Stroke Action plan led by the Cardiovascular Health and Stroke SCN and the Enhanced Recovery After Surgery project led by the Surgery SCN in collaboration with the Diabetes, Obesity and Nutrition SCN.

### **8.2.3 Workforce Research**

The Workforce Research and Evaluation (WRE) team of AHS conducts applied research and evaluation that focuses on health systems planning and workforce management. The group partners with organizations across sectors and across the country to collaborate on joint research projects.

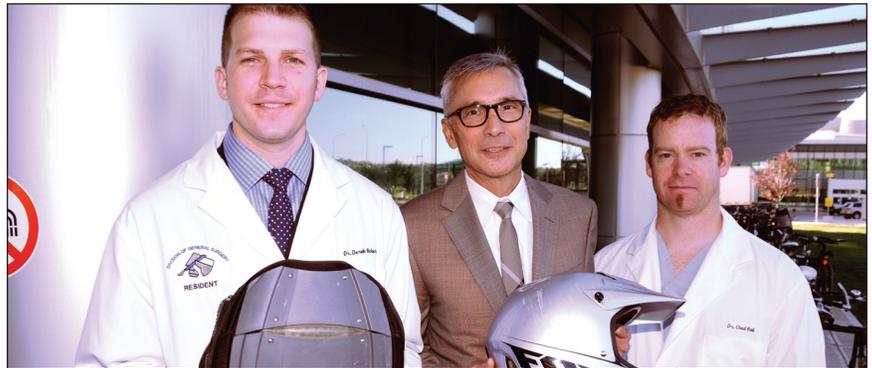
In the 2013-14 fiscal year, WRE secured more than \$920,000 in external funding for research on measuring staff mix, experiential learning for interprofessional care processes, and health care aide utilization in continuing care facilities. These projects are underway.

WRE's focus on workforce issues (such as optimal utilization of health care providers, staff mix issues, and interprofessional collaboration) and integrated services is relevant to many SCN projects. WRE has completed a number of projects with SCNs such as an evaluation of the centralized intake process for arthritis patients with the Bone and Joint Health SCN and a literature review on peer support programs for the Addiction and Mental Health SCN.

### 8.2.4 Evaluation Services

The Evaluation Services team of AHS provides expertise in evaluation to support improvements for practice and patient care at both the local and systems level. This team also supports the Alberta Evaluation Network (section 3.2.6).

This year, Evaluation Services provided service to a broad range of AHS administrative and operational staff working in acute care (Surgery, Urgent Care, Pediatrics, Palliative), primary and community care (including Family Care Clinics), primary care networks external to AHS, health care services within correctional institutes, Policy and the SCNs.



ABOVE: Brian Foster, centre, with some of the protective gear that likely saved him from suffering more serious injuries during a mountain biking accident. With him are Dr. Derek Roberts (left) and Dr. Chad Ball, authors of a research paper looking at cycling injuries.

#### Researchers compare cycling injuries

Trauma surgeons at Foothills Medical Centre in Calgary have looked at severe cycling injuries from 1995- 2009 and compared those that occurred on the street with those in the mountains. Both groups are injured more often in the summer months; mountain cyclists are younger; there are more injuries and fatalities among street cyclists, but more spinal injuries among mountain cyclists. Physicians advocate for helmet use and chest protection for injury prevention.

[www.albertahealthservices.ca/9005.asp](http://www.albertahealthservices.ca/9005.asp)

## 8.3 SHARING KNOWLEDGE

### 8.3.1 SharePoint Framework

This year, AHS implemented the SharePoint™ software framework to support easy search and location of knowledge (i.e. evidence for decision-making and practice) and use/reuse of knowledge, allowing researchers to innovate incrementally as opposed to constantly “reinventing the wheel.” This work involved:

- Information Architecture (IA): Classifying research-related documents using standardized records management policy, governance and security models, and file naming conventions to facilitate document location via SharePoint;
- Processes and methodology: Mapping of requirements into SharePoint functionalities to support research and business processes; and
- Education and Training: Creating and introducing an education curriculum to support users of SharePoint. The infrastructure has been applied and adopted by the SCNs for a variety of needs including:
  - Creating project collaboration sites, lessons learned repository, and reference libraries to support project work;

- Developing clinical knowledge documents to support evidence-based care for the Emergency SCN for withdrawal from alcohol intoxication, chronic obstructive pulmonary disease, hip fracture etc.; and
- Enhancing the use of the Challenge Dialogue System - a structured, collaborative approach to managing complex tasks and organizational change. The Challenge Dialogue process makes possible widespread consultation in a timely, efficient and cost-effective way.



ABOVE: AHS surgeon Dr. Adrian Harvey, Dr. Ryan Snelgrove and University of Calgary kinesiologist Dr. Joan Vickers. Researchers are looking at the phenomenon of ‘Quiet Eye’ to improve the performance of surgeons. Dr. Patric Ogle, holding a picture of his wife Debbie.

### 8.3.2 Integrated Library Services and Website

In April 2013, the Knowledge Resource Service (KRS) was launched within the AHS-Research, Innovation and Analytics Portfolio. This service brings together the entities formerly known as AHS’s Library Services (comprising 18 AHS physical library sites and staff) and the Health Information Network Calgary. In August, 2013 the KRS team launched a key deliverable for the service, the KRS website, thus creating a single, AHS-wide, point of desktop access to library services and resources.

The establishment of provincially integrated library services and availability of the website has produced measurable improvements in AHS physician, clinician, and staff ability to access and use knowledge resources and services to support research, innovation and evidence-informed decision making. While a formal evaluation of the service will be completed in 2014/15, Table 3 shows that uptake and utilization of these services has increased and preliminary feedback from users has been positive.

TABLE 3: KNOWLEDGE RESOURCE SERVICE REQUESTS				
SCN	2011-12	2012-13	2013-14	Total 2011-14
Document Delivery	19,686	14,177	25,136	58,999
Literature Reviews	2,785	2,699	2,983	8,467

Source: Health Information Network Calgary (HINC) Annual Reports, AHS Libraries and HINC Statistics Spreadsheets, LibAnswers (since August 2013).

#### Borrowing a sports concept for surgical training

Researchers within AHS and the University of Calgary are looking at the concept of ‘Quiet Eye’ (QE) as a possible tool to help train surgeons and make operations safer. QE refers to gaze behaviour just prior to initiating a critical physical movement. It has been well studied in sports and shown that elite athletes exhibit more QE than less skilled athletes. Researchers have now shown that highly skilled surgeons also display more QE than lesser skilled surgeons. QE has been used as an effective training concept in sports and the Implications are that complex surgical skills might one day be learned to a higher level in less time. Researchers have shown, for example, that residents learn to tie surgical knots more quickly and effectively when the concept of QE is included in the training.

[www.albertahealthservices.ca/9770.asp](http://www.albertahealthservices.ca/9770.asp)

