

APRIL 1, 2015 - MARCH 31, 2016



AHS ANNUAL REPORT ON

HEALTH RESEARCH



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1. MESSAGE FROM THE PRESIDENT & CHIEF EXECUTIVE OFFICER, AND VICE-PRESIDENT, RESEARCH, INNOVATION & ANALYTICS

In Alberta, research and innovation have long been part of the fabric of healthcare. This year, we affirmed and strengthened the role of research and innovation across all areas by introducing our *Strategy for Clinical Health Research, Innovation and Analytics, 2015-2020*.

Why is this important? Research and innovation improve patient care and health system performance. They drive advancements in medical science, shed light on trends in public health, and give us, in every aspect of our organization, better and sometimes new ways of doing things.

The research and innovation strategy provides a framework for supporting our healthcare teams and partners in their efforts to solve healthcare issues of importance to Albertans. It is one of four foundational strategies that Alberta Health Services is using to guide its future.

This year also saw the launch of two new Strategic Clinical Networks (SCNs): the Kidney Health SCN, and the Population, Public and Indigenous Health SCN. We have now created 13 SCNs as a means of optimizing and improving our healthcare system. These networks are made up of citizens, staff, and partners who are passionate and knowledgeable about specific areas of health, and who are dedicated to finding innovative ways of delivering care.

Lastly, we took an important step toward developing a single, integrated process for managing how innovations are introduced into the health system. We look forward to making Innovation Management Core Process a reality in the months ahead.

Research, innovation and analytics make a difference in the lives of our patients every day, ensuring AHS delivers the highest quality care and best value for Albertans. We invite you to look at the many examples of research and innovation presented in this year's Annual Report.

Dr. Verna Yiu, President & CEO

Dr. Kathryn Todd, Vice-President, Research, Innovation and Analytics

2. INTRODUCTION

As Canada's largest provincewide, fully integrated health system, our staff, physicians and volunteers are responsible for delivering health services to more than 4.2 million people living in Alberta, as well as to some residents of Saskatchewan, B.C., and the Northwest Territories. Being a provincewide integrated healthcare system allows us to share information, work seamlessly and provide standardized care to Albertans.

Every interaction with Albertans – whether as patients, residents, family members, or members of the community – offers an opportunity to learn. As a learning organization, AHS continues to seek ways to help our people create, acquire and use knowledge in order to raise the standard of care for Albertans. Our healthcare teams generate the evidence for new and improved services and treatments through clinical health research, innovation and data analysis (analytics). The ability of our staff, physicians and partners to generate, share and apply evidence is critical to providing patient-focused, quality care.

The AHS Annual Report on Research highlights the achievements of health research activities at AHS in the fiscal year 2015/16. These research activities align with the AHS *Strategy for Clinical Health Research, Innovation and Analytics 2015 - 2020*. The Innovation and Research Strategy outlines five strategic directions to better support our patients, healthcare professionals and partners in solving healthcare issues of importance to Albertans (see Figure 1). AHS adopted the five strategies to further guide our actions and to deliver better care to Albertans, today and in the future.

A COORDINATED APPROACH

The Innovation and Research Strategy is not alone. Using the AHS *Health Plan and Business Plan* as a roadmap, AHS adopted four foundational strategies to shape our actions to move the health system forward. The four strategies provide a coordinated approach – and by working together, we can use our resources effectively and provide a greater collective impact on our goals.

Patient First Strategy improves the patient’s experience by fully embracing a culture that places patients and families at the center of all healthcare activities, decisions and teams. To ensure Albertans are true partners in their healthcare and they support research that is relevant and appropriate to their needs, AHS will involve patients and the public in its research and innovation activities.

Our People Strategy focuses on creating a healthy workforce in which people feel safe, healthy and valued. Improving workforce engagement, workplace health and safety and our patient safety culture will, in turn, improve patient and family experiences, and move us closer to our vision of *Healthy Albertans. Healthy Communities. Together.* Ensuring we have an engaged and knowledgeable workforce is essential for creating research evidence, sharing knowledge and encouraging innovation.

Information Management/ Information Technology Strategy aims to make the right information available to the right people at the right time across the health system, so that healthcare providers can rely on data to make meaningful decisions to improve healthcare for Albertans. Clinicians and patients across the province will have access to specific information about healthcare delivery, while researchers and healthcare leaders can use data to learn more about the system and make significant decisions.



Figure 1:
Our Priorities and Outcomes

The five priorities are inter-related and actively involve patients, staff and many partners in working together to improve health in Alberta. This report profiles the work and achievements of the AHS research community. It includes work undertaken within AHS as well as between AHS and our valued research partners in the province. Stories throughout the report show the impacts of research on our healthcare system and on Albertans.

3. BUILD STRONG PARTNERSHIPS

The ability to create, share and apply evidence to improve healthcare is a collaborative and multidisciplinary endeavor. In 2015/16, AHS facilitated and supported significant health research. Through strategic partnerships, AHS has increased its capacity for quality health research that takes place in Alberta. Much of this is through provincial programs, networks and research institutes in academic centres or hospital settings, supported by a variety of national and provincial funding sources. AHS has established partnerships with many of these organizations through collaboration on research projects, human resources and funding opportunities.

3.1 STRATEGIC CLINICAL NETWORKS

To get the most out of our healthcare system, AHS has created networks of people who are passionate and knowledgeable about specific areas of health, challenging them to find new and innovative ways of delivering care with better quality, outcomes and value for every Albertan.

Working closely with frontline clinicians and Albertans who receive care, the Strategic Clinical Networks (SCNs) allow researchers, innovators and funders to align their efforts with the priorities of AHS and its patients. There are currently 13 SCNs within AHS, including two new SCNs launched in 2015/16: the Kidney SCN and the Population, Public and Indigenous Health SCN.

SCNs map out the best care options for Albertans based on clinical evidence. These options are translated into clinical care pathways, a key tool to promote organized and effective patient care. The pathways outline the patient's journey across the care continuum – from primary care to acute and community care and back to primary care.

The SCNs embed university-based researchers within the health system, giving researchers a better understanding of key health challenges facing Albertans and a stronger ability to apply their knowledge and inform care. The SCN research unit builds partnerships that foster health research capacity and supports prioritized applied clinical research, health services, systems and policy research, as well as population and public health research.

The following sections highlight key achievements by researchers across the SCNs.

3.1.1 ADDICTION AND MENTAL HEALTH SCN

- **Depression Research Priority Setting Project:** A collaboration with the Strategy for Patient Oriented Research (SPOR), Patient Engagement platform, Canadian Depression Research and Intervention Network, and Campus Alberta Neuroscience, this project asked patients to identify their top priorities for depression research from a patient and family perspective. This list will be used to make decisions on future funding allocations in the next year.
- **Choosing Wisely Canada - Implementing Psychiatric Recommendations:** Choosing Wisely Canada is a campaign to help psychiatric clinicians and patients engage in conversations about commonly-used tests and treatments that are not supported by evidence, or that could expose patients to unnecessary harm. The goal of the campaign is to help patients make smart and effective choices to ensure they receive high-quality psychiatric care. Key achievements of the campaign include:
 - **Updating evidence on select topics for implementation**
 - **Establishing a partnership with the Physician Learning Program, the Alberta Medical Association, and Choosing Wisely Canada**
 - **Identifying a process to gather prescribing data from various clinical systems**
 - **Engaging physicians and administrators to analyze the prescribing data and support a knowledge translation and change management plan**

- **Repetitive Transcranial Magnetic Stimulation (rTMS):** rTMS is a non-invasive, safe and effective treatment option that could potentially help restore the quality of life in those suffering from treatment-resistant depression in Alberta. AHS approved the introduction of rTMS in Alberta based on the evidence in the Health Technology Assessment. The SCN started working with clinicians, researchers, administrators and patients on service design options (including primary care) for the development of clinical knowledge guidelines and best practices, ensuring the standardized application of rTMS across the province.
- **School Mental Health:** Schools play an integral role in the delivery of programs intended to improve the mental health of children and adolescents. There are currently a number of school-based initiatives that support mental health, social/emotional learning, stigma reduction, resiliency, and reducing drug and alcohol use. The SCN sees an opportunity to develop a full continuum model for school mental health based on age and stage of development. Key accomplishments this past year include:
 - **Exploration and discussion among provincial ministry partners in Education, Health and Human Services to clarify the purpose, vision, scope, approach and timelines**
 - **Launching a current state assessment of mental health programs and services in schools**
- **Naloxone Evaluation:** Take-home Naloxone kits are being distributed throughout Alberta as one line of defense against the growing use of fentanyl and fentanyl-related deaths. Partnering with the zones, AHS Addiction and Mental Health provincial team and community providers, the SCN is evaluating the outcomes, access and process of this program and its expansion to measure and improve upon its success.

3.1.2. BONE AND JOINT HEALTH SCN

- **Learning Collaboratives Spread Knowledge:** This year, the SCN used the Institute for Healthcare Improvement's Learning Collaboratives to facilitate learning and teamwork. The process fosters collaboration between clinical sites through transparent sharing of scorecard results. It also enables in-the-moment conversations across sites to identify strategies that maximize quality results. The specific sessions held this year included a focus on the funding methodology and the connection to quality; efforts to assist sites with increasingly detailed costing information and supports; a review of progress on quality measures evaluated on the Balanced Scorecard; breakout sessions on clinically relevant topics such as the use of Patient Reported Outcome Measures; strategies to address length of stay, infection rates, and operating room turnover; and approaches to address the needs of patients with comorbid obesity.
- **Acquiring Data to Understand Musculoskeletal Conditions:** Working with the Alberta Bone and Joint Health Institute (ABJHI) and building on the strong base of information for the hip and knee arthroplasty population, the SCN accessed critical information about musculoskeletal (MSK) conditions through sources such as diagnostic imaging, pharmacy and lab data. When linked to existing patient records, this data allows the SCN to provide detailed analysis of factors related to variance in care and outcome for MSK conditions and disorders. It also enables the development of more complete clinical profiles for Albertans receiving health services. The information contributes to more accurate quantification of the treated prevalence of various MSK disorders. Including this type of information in planning and modeling analyses more accurately estimates unmet needs, service gaps and opportunities to improve the continuity of care.

3.1.3 CANCER SCN

- **Improving Quality of Care for Cancer Patients:** Through the provision of eight competitive seed grants, the SCN supported research that will improve the quality of care for patients with cancer. Among these:
 - **Dr. Gordon Wilkes and his team have developed and pilot-tested a new breast prosthesis that was well-received by patients.**
 - **Dr. Ivo Olivotto and colleagues are working to reduce the amount of radiotherapy required by patients with breast cancer.**

- **Dr. Jana Rieger and colleagues have improved speech and other patient-reported outcomes in head and neck cancer through the use of surgical planning and cutting guides.**
- **Dr. Judith Hugh and her team have validated a new molecular test for early stage breast cancer that could lead to faster diagnostic results and reduced costs.**
- **Dr. Edith Pituskin and colleagues are working identify, describe and compare characteristics of early breast cancer treatment models in Alberta.**
- **Head and Neck Cancer Pathway:** To improve patient experience and address gaps in care, the SCN led the design and implementation of a provincial perioperative clinical pathway for major head and neck cancer surgery. Pre-implementation and post-implementation data were analyzed and preliminary results showed that 330 ICU bed days per year have been released to the system in Edmonton (estimated cost avoidance of \$660,000 to \$1,633,500 per year); 1,795 hospital (non-ICU) bed days were released to the system in Edmonton and Calgary per year; and post-surgery complication rates decreased by more than 30 per cent in Edmonton.
- **Rectal Cancer Pathway:** Based on foundational work in 2014/2015 to develop a rectal cancer pathway, a team from the SCN delivered multidisciplinary physician education sessions across the province for surgeons, pathologists and pathology assistants. These educational sessions focused on best practices and strategies for increasing local uptake of the pathway. Work is underway to provide clinicians with individual data on performance and patient outcomes.



Study weighs lung cancer screening for early detection

Researchers in Calgary and Edmonton have launched a lung cancer screening study to determine the best criteria for catching the deadly disease while it is still treatable.

<http://www.albertahealthservices.ca/news/releases/2015/Page12863.aspx>

3.1.4 CARDIOVASCULAR HEALTH AND STROKE SCN

- **Vascular Risk Reduction:** VRR is a series of projects focused on implementing and evaluating innovative vascular risk factor screening and early management service models. A number of collaborators were involved in this initiative, including 52 pharmacies, 350 primary care physicians, clinics and workplaces. Highlights of VRR's impact:
 - **The Community Pharmacy initiative reduced the cardiovascular (CV) risk of participating patients by 21 per cent in only three months. It also produced randomized controlled-trial evidence on the efficacy of community pharmacists to reduce CV risk. Participants saw significant improvement in their lipids, systolic and diastolic blood pressures, and blood sugars.**
 - **The Alberta Screening and Prevention project resulted in a 17.3 per cent increase in screening of patients in Primary Care for multiple risks.**
 - **The Enhanced Lipid Reporting project established a successful model to decrease inappropriate lipid panel ordering and is now being considered for provincewide implementation.**
 - **The SCN's Knowledge Translation efforts established partnerships with eight healthcare**

organizations and spread important vascular health information to more than 400,000 Albertans.

- **Stroke Action Plan:** The Stroke Action Plan is a provincewide innovation in service delivery to ensure stroke patients in small-urban and rural settings receive the same level of care as patients in larger centres. Early Supported Discharge programs were implemented at five small-urban Primary Stroke Centres and Stroke Unit-Equivalent Care was established at 13 sites.
- Additionally, usage of standardized stroke order sets (a standardized list of orders for a specific diagnosis) increased from 48 to 76 per cent; length of stay for acute stroke patients was reduced by 17 per cent (14.8 days to 11.8 days); and 95 per cent of patients who received Early Supported Discharge reported high levels of satisfaction with the new model. The Stroke Action Plan has been awarded the Co-Chairs' Award for Impact by the Canadian Stroke Congress and has been acknowledged as setting a new standard of care for stroke patients in Canada.

3.1.5 CRITICAL CARE SCN

- **Family Participation in ICU Rounds:** Integrating patient and family needs and values into patient care is a core component of the SCN's mission to deliver the best care to critically ill patients through innovation and collaboration. The SCN has undertaken a provincewide observational study and a provincewide mixed methods needs assessment to develop a standardized approach for involving patients and families in ICU rounds. This process will identify key gaps in patient and family engagement that need to be addressed. The research results will be used to develop a clinical practice guideline to effectively integrate families into ICU rounds.
- **Venous Thrombembolism Prophylaxis:** The SCN is leading a Partnerships for Research and Innovation in the Health System (PRIHS) project to identify and close evidence-care gaps in critical care medicine. The top rated care gap across Alberta's ICUs is ensuring the appropriate clotting agent is being used in venous thrombembolism prophylaxis. This work has involved the identification and prioritization of care practices in ICUs across Alberta, a provincewide survey of facilitators and barriers to closing this top rated gap, and the creation and launch of interventions to prompt and sustain practice change. Ongoing audits demonstrate that clinical practice has been steadily responsive to these interventions. Key outcomes include improved patient care and health system savings of about \$2.3 million per year.
- **Increasing Research Capacity:** The SCN forged a new partnership with the Division of Critical Care, University of Alberta, the Department of Critical Care Medicine, University of Calgary and the Canadian Frailty Network to support funding stipends for two post-doctoral fellows successively over the course of a four-year period (2018-2023). This funding will expand and enhance the participation of new investigators through the incorporation of trainees, increased capacity for scientific work in critical care medicine, and improving the care delivered to critically ill patients through knowledge creation and knowledge translation.

3.1.6 DIABETES, OBESITY AND NUTRITION SCN

- **Provincial Inpatient Diabetes Management Initiative:** The Provincial Inpatient Diabetes Management Initiative, in consultation with AHS Clinical Quality Metrics, has developed an audit tool designed to support acute care sites in their glycemic management improvement activities. Developed and disseminated using the new AHS system-wide interactive reporting system called Tableau, the audit tool is designed to provide frequent, ongoing updates on progress toward improved glycemic management to site implementation teams. The audit tool is populated using a combination of manually-collected information and provincial administrative data to report on a number of metrics that include insulin ordering practices and glycemic control.
- **Diabetes Foot Care Clinical Pathway:** The Diabetes Foot Care Clinical Pathway Project aims to optimize methods that prevent, detect and treat foot ulcers with the goal of reducing lower leg amputations and improving the quality of life for Albertans with diabetes. The SCN secured funding for two Accelerating Innovation Into Care grants that were made possible through Alberta Innovates – Health Solutions. The grants support partnerships with two Alberta-based companies that are trialing their technologies in a clinical setting:
 - **ORPYX platform technology, the SurroSense Rx, is comprised of pressure-sensing inserts worn**

inside of a patient's shoes. When the inserts detect dangerous time and pressure thresholds, the patient is notified via a smartwatch. The system also tracks and stores data to provide ongoing insight into what is happening underfoot. This technology seeks to prevent foot ulcers from developing or worsening, avoiding the need for amputation.

- Exciton developed exsalt® wound dressings, which uses silver oxysalts to heal wounds. This product uses the antimicrobial properties of silver to prevent bacterial growth and reduce the spread of infection, which are severe issues for patients with diabetes.



Game-changing new therapy heals foot ulcers

Total contact cast therapy is a new treatment option for diabetic foot ulcers at the outpatient clinic at the Queen Elizabeth II Hospital in Grande Prairie.

<http://www.albertahealthservices.ca/news/features/2015/Page11360.aspx>

3.1.7 EMERGENCY SCN

- **Targeting Population Needs:** The SCN provided the healthcare data to support two studies that should inform future targeted interventions for specific patient populations:
 - **Substance abuse:** Dr. Jessica Moe, a University of Alberta resident in Emergency Medicine and graduate student in Public Health, is studying patients who present to Alberta emergency departments (EDs) with substance abuse in order to understand patient characteristics and healthcare usage trends that predict mortality.
 - **Asthma:** Dr. Laura Rodriguez, a Public Health PhD, is studying the association between outdoor air pollution, socioeconomic status and ED visits for asthma.
- **Increasing Efficiency:** The SCN has championed the use of data for ED operations in Alberta by launching and streamlining several dashboards that report on timely and relevant ED operations/throughput measures, such as visit volume, wait times, triage scores and presenting complaints. ED managers can easily access these measures, allowing for comparison and benchmarking across the province. Identified practice variations have led to further efforts to reduce variation and increase efficiency.
- **Increasing Research Capacity:** The SCN has funded seven students across the province through the Summer Studentship Award program to work on emergency medicine research topics. This year, the SCN also funded four small systematic review grants relevant to emergency medicine.

3.1.8 KIDNEY SCN

- **Treatment Options Pathway for Kidney Failure:** This year the SCN partnered with the Northern and Southern Alberta Renal Programs and the Canadian Kidney Knowledge Translation and Generation Network to develop a provincewide approach to patient education around treatment options for kidney disease. The Treatment Options Pathway, being phased in across the renal programs in Alberta, will help patients make informed decisions with respect to treatment for kidney failure, living donor transplantation, home dialysis, and non-dialysis conservative care. Use of the Treatment Options Pathway bridges gaps in communication among

patients and care providers. The goals are two-fold: that patients receive the treatment modality of their choice and that there is an increase in living donor transplantation, home dialysis and non-dialysis conservative care. A new Alberta-based patient **teaching video** introduces treatment choices, provides patient education and helps patients select the best options for treating chronic kidney disease.



Alberta girl with a rare kidney disorder joins national study

A five year-old Alberta girl is enrolled in a national study that aims to identify best practices in treating nephrotic syndrome, a condition in which blood protein ends up in the urine.

<http://www.albertahealthservices.ca/news/features/2015/Page12629.aspx>

3.1.9 MATERNAL NEWBORN CHILD AND YOUTH SCN

- **Health Outcomes Improvement Fund:** AHS Nutrition and Food Services provided funding through the SCN toward high-caliber research and quality improvement projects. A steering committee of stakeholders from AHS, academic research institutes, Alberta Innovates – Health Solutions (AIHS), and a patient representative all collaborated to design the Health Outcomes Improvement Fund. This fund provides research investment and potentially more partnerships for the next three or more years. This research has the potential to improve health outcomes for Albertans, specifically the maternal, newborn, child and youth populations.
- **MyChildALBERTA:** This project links administrative and health data of mothers and their children, and aims to provide valuable information on how a mother's health and use of healthcare services can impact the health of her child. This project strengthens partnerships between the SCN and the Women and Children's Health Research Institute (WCHRI) at the University of Alberta. It will create better health evidence that should lead to improved health outcomes for Albertans.
- **Discontinuance of Fetal Fibronectin (fFN) Testing for Preterm Labour in Alberta:** Fetal Fibronectin (fFN) tests determine whether preterm labour is occurring. In early 2013, AHS began a review of Alberta Health's 2006 decision to publicly fund fFN tests for all Alberta women. The practice was implemented in 2006 with the goal of reducing unnecessary ambulance transfers and admissions through better identification of false preterm labour. However, the test and its clinical interpretation did not prove effective in improving the assessment or management of preterm labour. The SCN and the Health Technology Assessment and Adoption team worked with the provincial clinical community and laboratory services to remove the fFN from Alberta's healthcare system in the fall of 2016. Removing the test will not negatively affect patient outcomes and will save money that can be used elsewhere in the healthcare system.
- **Family Integrated Care (FICare):** FICare is a PRIHS-funded project implemented in 10 Alberta Level II NICUs to help parents care for their babies. Responses to the program have been overwhelmingly positive. FICare improves the health of babies, reduces stress in their parents and enables families to go home sooner.



Alberta invention gives preterm babies best possible start

Researchers at Foothills Medical Centre have developed a device that allows preterm infants to receive resuscitation immediately after birth while remaining connected to their umbilical cord. The risk of brain bleeds is reduced by 50 per cent when babies remain connected to the umbilical cord for one to three minutes after birth.

<http://www.albertahealthservices.ca/news/releases/2015/Page12775.aspx>

3.1.10 RESPIRATORY HEALTH SCN

- **Childhood Asthma:** A Partnership for Research and Innovation in the Health System (PRIHS) grant funded a second research project about primary care pathways for childhood asthma. The project puts a treatment guide directly into a child's electronic medical record with their family physician to ensure they receive the best evidence-based care.
- **Chronic Obstructive Pulmonary Disease (COPD):** The SCN has partnered with the Institute of Health Economics to produce the first economic evaluation of the disease burden and patterns of health services used for COPD in Alberta.
 - In partnership with AHS Analytics, the SCN created COPD data dashboard workbooks to facilitate ongoing monitoring of COPD admissions and hospital length of stay in AHS facilities.
 - A PRIHS grant funded a research project about 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.
 - Standardized admission order sets (a standardized list of orders for a specific diagnosis) for inpatient stays following an exacerbation of COPD have combined the most up-to-date guidelines for treatment with the impetus for discharge planning earlier in the process, and have strengthened the relationship with both emergency and community follow-up services. The SCN is leading the provincial implementation of standardized COPD admission order sets with planning and engagement initiated in all zones. Order set implementation in the Calgary Zone has shown a decreased length of stay (1.5 days) and no increase in re-admission or emergency department re-visit rates.



Healthier kids the goal of Alberta Primary Care Pathway for Childhood Asthma

Children with asthma could soon be breathing easier thanks to new research that promises to put a treatment guide directly into their electronic medical record with their family physician to ensure they receive the best evidence-based care.

<http://www.albertahealthservices.ca/news/releases/2016/Page13003.aspx>

3.1.11 SENIORS HEALTH SCN

- **Supporting the Important Role of Caregivers for Alberta's Seniors:** Friends and family caregivers are a vital component of our healthcare system requiring support to continue to serve in this important role of providing for Alberta's seniors. In partnership with Covenant Health Network for Excellence in Seniors Health and Wellness and other key stakeholders, the SCN led a meeting funded by Canadian Institute of Health Research (CIHR) to bring together researchers, practitioners and caregivers to discuss the issues that affect caregivers as they provide care to Alberta's seniors. The results included:
 - **A successfully funded research project investigating an online support tool for family caregivers, as well as two knowledge dissemination products.**
 - **A peer-reviewed article detailing the discussion and outcomes of the meeting, forthcoming in the *Canadian Journal on Aging*.**
 - **A toolkit targeted to healthcare providers and groups who support family caregivers, produced and disseminated in print and *available electronically*.**
- **Supporting Long-Term Care Teams on the Appropriate Use of Antipsychotics:** The SCN has continued to support long-term care teams to address appropriate use of antipsychotics in older adults with dementia. This involves working with family advisors to develop content and measurement tools as well as educating caregivers across the province in two key areas:
 - **Nighttime Sedation:** Antipsychotics are known to be administered as sleeping pills with limited evidence of benefit and mounting evidence of negative outcomes. Reductions in nighttime sedative use have been encouraged by implementing non-pharmacologic strategies to promote sleep, such as decreasing noise at night and increasing activity and light exposure during the day. This has resulted in decreased sedative use as well as fewer reported falls.
 - **Delirium:** Antipsychotics may be prescribed when distressing psychosis occurs in people who develop delirium. Strategies to reduce the incidence of delirium include ensuring adequate hydration and nutrition, supporting good sleep and de-prescribing medications with high cholinergic cognitive burden. The indicator for the use of antipsychotics in long-term care provincially has continued to decrease to a national low of 18.1 per cent, resulting in improved quality of care for older residents.



'Elder-friendly' surgical unit to get seniors home sooner

Getting elderly patients home sooner, stronger and with fewer complications after emergency general surgery is the goal of an 'elder-friendly' emergency surgical unit now being created at the University of Alberta Hospital.

<http://www.albertahealthservices.ca/news/releases/2015/Page11688.aspx>

3.1.12 SURGERY SCN

- **Surgical Research, Engagement and Development (SEED) grant program:** This year, the SCN continued the Surgical Research, Engagement and Development (SEED) grant program. Scientists and clinician researchers collaborated with the SCN to develop 67 research proposals identifying surgical research priorities in the

province. More than \$80,000 of funding was given to support pilot investigations that could significantly improve patient care quality.

- **National Surgery Quality Improvement Program:** Two pivotal programs, the National Surgery Quality Improvement Program (NSQIP) and Trauma Quality Improvement Program (TQIP), were implemented at five major surgical sites across Alberta this year. These programs were devised by the American College of Surgeons to help drive quality improvement initiatives at surgical sites through clinical data measurement and a structured model for clinician leadership. The programs were implemented at Calgary's Rockyview General Hospital, the University of Alberta Hospital in Edmonton, Red Deer Regional Hospital, Queen Elizabeth II Hospital in Grande Prairie and Chinook Regional Hospital in Lethbridge, as well as at all Level 1 and 2 Trauma sites. Early program results show improvements in patient satisfaction through surgical review and physician follow-up, and improved surgical site infection rates at many of the pilot sites. For more information, see the [***NSQIP website***](#).
- **Enhanced Recovery after Surgery (ERAS):** Implementation of the ERAS program continues to improve care delivery before, during and after surgery. In partnership with the Diabetes, Obesity and Nutrition SCN, research supported by the Surgery SCN highlighted significant patient outcome improvements at six hospitals in Edmonton and Calgary (Peter Lougheed, Foothills Medical Centre, Grey Nuns Community Hospital, University of Alberta Hospital, Royal Alexandra Hospital and the Misericordia Community Hospital). Through this program, patients undergoing treatment have been discharged an average of two to three days sooner than before while meeting clinical milestones. An economic evaluation by the SCN supported the allocation of funds to implement the ERAS program at the Rockyview General Hospital, Red Deer Regional Hospital and Chinook Regional Hospital. Finally, the SCN formulated and published guidelines for perioperative care in gynecologic/oncology surgery, which will help advance surgical care for both major gynecology and gynecologic oncology. The SCN is linking these guidelines with the ERAS Interactive Audit System (EIAS).
- **Adult Coding Access Targets for Surgery (aCATS):** This Alberta-developed, standardized system helps prioritize elective surgeries throughout the province, depending on a patient's diagnosis and level of urgency. aCATS is a valuable tool being used by administrators and clinicians to understand surgical access pressures and capacity gaps both locally and provincially. In November 2015, aCATS was used at 32 healthcare sites in Alberta. This year, the creation of the aCATS Surgeon Advisory Group (13 surgeons from 11 services and five zones) resulted in increased physician engagement and has provided excellent surgeon leadership.



Breast reconstruction patients having quicker recoveries

Many Calgary women undergoing mastectomy and breast reconstruction are leaving hospital sooner with the expansion of Enhanced Recovery After Surgery (ERAS), a set of practices before, during and after surgery that's helping to shorten hospital stays.

<http://www.albertahealthservices.ca/news/Page12854.aspx>

3.2 ALBERTA'S HEALTH RESEARCH INSTITUTES

Alberta has invested in a number of health focused research institutes. Through the combined efforts of the University of Alberta, the University of Calgary and AHS, these institutes bring together researchers, clinicians, educators, patients and their families to address key health issues. From basic science to clinical research, these

institutes help to create a healthy future for all Albertans by making discoveries and translating science into innovative health solutions.

The following sections outline key research achievements this past year.

3.2.1 ALBERTA CHILDREN'S HOSPITAL RESEARCH INSTITUTE (ACHRI)

ACHRI is a multi-disciplinary institute of AHS, the University of Calgary and the Alberta Children's Hospital Foundation. The institute's 250 members encompass the faculties of Arts, Education, Kinesiology, Medicine, Nursing, Science, Social Work and Veterinary Medicine. The institute also collaborates with the Maternal Newborn Child and Youth SCN. The institute's strategic plan was launched in 2015 providing a roadmap toward becoming the leading child health research institute in Western Canada.

ACHRI's spectrum of research interests spans basic science, health promotion, disease prevention, and innovations in diagnosis, treatment and rehabilitation. In partnership with the University of Calgary, the institute recruited 15 new researchers and achieved a 23 per cent increase in Canadian Institute of Health Research funding over the previous year.

Research highlights:

- **ACHRI Creating Capacity for Precision Medicine in Alberta:** One in four children admitted to the Alberta Children's Hospital has an unknown or undiagnosed illness. By contributing to the identification of 30 new genes associated with childhood disorders, these ACHRI researchers are building upon national projects: FORGE Canada and the Care for Rare network. In May of 2015, the Cumming School of Medicine announced an ACHRI-led Centre for Health Genomics and Informatics, formalizing collaborative research and service relationships with the Cumming School of Medicine; the Arnie Charbonneau Cancer Institute; the Infections Inflammation and Chronic Disease research theme (IICD); the Faculty of Veterinary Medicine; and AHS. In addition, the institute is collaborating with IBM to enhance researchers' ability to generate, store and analyze complex clinical, genetic and imaging data.
- **ACH Leads Stem-cell Cure for Kids with Sickle Cell Anemia:** The Alberta Children's Hospital is believed to be the only pediatric centre in the world that is successfully using a novel stem cell transplant procedure to cure children of sickle cell anemia. To date, seven girls and two boys with the genetic blood disorder have been cured through a process that first destroys the existing blood system, then grows a new system from the transplanted stem cells of an immune match family member. The procedure was first performed in Calgary in 2009. Then, the Sickle Cell Clinic treated 16 children. Now there are more than 80 children in the clinic.
- **APPETITE Research to Better Identify Intestinal Infections:** More than 30,000 children are admitted to emergency departments in Alberta each year with enteric infections. With a goal of finding a better way of identifying pathogens to improve enteric diagnostics and enhance treatment, the Alberta Provincial Pediatric Enteric Infection Team (APPETITE) is evaluating the use of a molecular diagnostic lab test and novel specimen collection. Nearly 2,000 children have been recruited to participate in the study from across the province. For the 4,272 specimens received from these patients, 75 per cent had one or more enteric pathogens identified.
- **Researcher Uses Robotic Device to Aid Research on Brain Injuries:** Through the only study of its kind, researchers are laying the groundwork to develop personalized rehabilitation therapies for children with early brain injuries by using the KINARM to measure their proprioception, or position sense and imaging, to understand sensory and motor tracks in the brain. Funded by the Cerebral Palsy International Research Foundation, 47 children with perinatal stroke and 124 healthy control children have participated in the study to-date.
- **Finding New Therapies for Teen Depression:** Suicide accounts for 24 per cent of deaths among teenagers and young adults, according to the Canadian Mental Health Association. In June 2015, ACHRI and the University of Calgary opened a new research space dedicated to studying neurodevelopment and child mental health. ACHRI researchers in collaboration with the Mayo Clinic are opening clinical trials to study transcranial magnetic stimulation as a new therapy to treat teen depression.



Training in teamwork essential for saving young lives

New research shows training in teamwork and communication translates into better performances by teams of pediatric specialists who respond to cardiac emergencies.

<http://www.albertahealthservices.ca/news/releases/2015/Page12512.aspx>

3.2.2 ARNIE CHARBONNEAU CANCER INSTITUTE (FORMERLY KNOWN AS THE SOUTHERN ALBERTA CANCER RESEARCH INSTITUTE [SACRI])

The Arnie Charbonneau Cancer Institute at the University of Calgary is a community of researchers and educators dedicated to achieving a cancer-free future. The Institute brings together scientists and physicians to integrate research and care across disciplines – from understanding and preventing cancer, to transforming its detection and treatment, to improving life with and after cancer. Members include researchers at the Tom Baker Cancer Centre and the University of Calgary's Cumming School of Medicine and Teaching Hospitals.

Research highlights:

- **Understanding how the biology of cancer leads to new diagnostics, treatments and clinical trials that redefine standards of care.**
- **New technologies to detect early cancers and prevent cancer through lifestyle modification, silencing cancer-causing inherited susceptibilities and swaying public health policy in ways that greatly reduce cancer risk.**
- **Psychosocial and physical effects of cancer and the challenges that accompany life after cancer for the increasing number of long-term survivors.**



Online forum supports women with gynecological cancers

Women in Alberta recovering from gynecological cancers can now discuss their concerns, securely and anonymously, as part of an online support group that is being evaluated by researchers.

<http://www.albertahealthservices.ca/news/releases/2015/Page11359.aspx>

3.2.3 CANADIAN VIGOUR CENTRE (CVC)

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. The CVC also offers research services in the areas of thought leadership, health economics, biostatistics, clinical trials monitoring, processing and analysis of electrocardiographic data and financial management.

Research highlights:

- **Clinical Trials:** 11 industry and grant-funded projects are currently underway and 124 principal investigators are participating in CVC-managed trials across Canada and internationally (Mexico and Chile).
- **Publications:** The CVC's body of research produced 55 publications.
- **International Lectures and Presentations:** CVC faculty delivered more than 45 lectures and presentations in countries throughout the world, including India, England, South Korea, Malaysia and the United States.
- **Mentoring:** Inspiring and nurturing the next generation of researchers, senior national and internationally recognized clinicians mentored 17 trainees pursuing research opportunities with the CVC faculty.
- **Data Repository:** More than 900,000 data elements reflecting the health of Albertans with cardiovascular disease were captured within the CVC data repository.
- **CVC Clinical Trials Colloquium:** CVC hosted the third annual CVC Clinical Trials Colloquium in Banff, Alberta in collaboration with the ACC Rockies meeting. This event brought together representative investigators and study coordinators with presenters from the CVC, Duke Clinical Research Institute and clinical trial sponsors.
- **Paul Armstrong Symposium:** Four internationally renowned cardiologists were featured at a symposium hosted by CVC honouring Dr. Paul Armstrong's 35 years of exemplary care, discovery and mentorship as a cardiologist.

3.2.4 CANCER RESEARCH INSTITUTE OF NORTHERN ALBERTA (CRINA)

Cancer Research Institute of Northern Alberta (CRINA) is a newly formed research institute at the University of Alberta that links AHS-supported researchers at the Cross Cancer Institute with investigators throughout the entire campus. This year, CRINA brought together collaborators in engineering, science, medicine and agriculture to attack problems in cancer from new and creative angles. This was aided by events such as the Gairdner Symposium on Cancer and an annual research day that brought together more than 300 researchers.

Research highlights:

- **Imaging to Better Detect and Treat Cancer:** CRINA researchers are world leaders in the area of cancer imaging. Accomplishments include the derivation and refinement of chemical tracers that can detect and kill cancer cells, as well as the inception and construction of machines that can better direct radiation therapy to tumours with fewer side-effects.
- **Decreasing Treatment Side-Effects and Preventing Cancer Recurrence:** Leading discoveries from CRINA, spanning the laboratory to clinical trials, include a 2015 study by Dr. Kerry Courneya and colleagues showing that exercise can reduce recurrences in breast cancer patients. In addition, primary results of the Multidisciplinary Approach to Novel Therapies in Cardiology Oncology Research (MANTICORE) randomized control trial, presented in 2015, revealed that beta-blockers can be used to prevent/reduce cardiotoxicity in patients receiving Herceptin, a drug used to treat breast cancer.
- **Targeting Cancer Vulnerabilities:** CRINA researchers are studying the biological underpinnings of cancer growth, therapy resistance and metastasis so new therapies can be developed. For example, in a 2016 Cell Reports study, CRINA scientists, led by Dr. Richard Lehner, revealed that so-called "bad" cholesterol can promote tumour growth. Also, in a number of papers published in 2015, Dr. David Brindley and colleagues showed that inhibiting an enzyme called autotaxin can inhibit tumour growth, invasion, metastasis and chemoresistance.



Exercise reduces cancer risk in post-menopausal women

Five hours of exercise per week can reduce the risk of developing cancer, including breast cancer, in post-menopausal women, according to an AHS research study.

<http://www.albertahealthservices.ca/news/features/2015/Page11641.aspx>

3.2.5 HOTCHKISS BRAIN INSTITUTE (HBI)

The HBI is an international centre of excellence in brain and mental health research and education, operating in partnership with AHS and the University of Calgary. The institute's 135 members, along with a team of nearly 600 professional staff scientists and trainees, drive progress towards the HBI's vision of healthy brains for better lives.

Research highlights:

- **Launching the University of Calgary Brain and Mental Health Research Strategy:** In May 2015, the university launched a campus-wide strategy to advance brain and mental health research as an institutional priority, led by the HBI. More than 150 researchers have joined nine interdisciplinary "NeuroTeams" in the areas of Mental Health, Epilepsy, Stress, Multiple Sclerosis, Traumatic Brain Injury, Spinal Cord/Nerve Injury and Pain, Stroke, Dementia and Cognitive Disorders, and Movement Disorders.
- **Leadership in Brain Cancer Research:** HBI Director Dr. Samuel Weiss was named co-leader of the Stand Up to Cancer Canada Cancer Stem Cell Dream Team. The team of top Canadian scientists will lead a new attack on brain cancers in children and adults, focusing on the stem cells that drive the growth of tumours.
- **Protecting the Brain from Stroke:** A study led by Dr. Roger Thompson, co-leader of the Stroke NeuroTeam, published an exciting new study that shows a new signaling pathway in neurons that may help researchers understand how to protect the brain during a stroke.
- **Overeating Insights:** An animal study led by Dr. Stephanie Borgland, co-leader of the Stress NeuroTeam, provides new insight into how high-fat diets rapidly rewire the brain's reward circuits. The study could contribute to the understanding of what underlies overeating.
- **Educating Healthcare Providers on Stroke Treatment:** The leaders of the ESCAPE Stroke Trial, which discovered a new treatment that dramatically improves recovery from ischemic stroke, invited the world to Alberta for a knowledge-translation retreat in February. Physicians, nurses and other frontline healthcare workers learned from the HBI team how to improve stroke care at their hospitals across Alberta, Canada and the world.
- **New Technologies to Treat Adult Depression:** This year the HBI launched the first of its "NeuroTechnologies" platforms, which provide cutting-edge technologies to elevate research across all of the Brain and Mental Health NeuroTeams. The first platform uses a handheld magnetic coil to non-invasively stimulate targeted regions of the brain, called Repetitive Transcranial Magnetic Stimulation (rTMS). rTMS is already being implemented as a treatment in Alberta for adult depression in cases where standard treatments are ineffective. This research is being led by the HBI.



AHS clinical health research strategy inspires innovation

In 2013, Donna Sharman suffered a life-threatening stroke and was rushed to Foothills Medical Centre. Fortunately, she was eligible to participate in a research study called ESCAPE that used a revolutionary surgical procedure to remove the blood clot in her brain.

<http://www.albertahealthservices.ca/news/features/2015/Page12874.aspx>

3.2.6 INSTITUTE FOR RECONSTRUCTIVE SCIENCES IN MEDICINE (IRSM)

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

Over the past year, iRSM has supported 26 studies that span work across four platforms of research: reconstructive medicine, surgical intervention technologies, outcomes and analytics, and implantable hearing solutions.

Research highlights:

- **Regeneration of Nasal Cartilage Project:** A research team completed basic research in the area of cartilage regeneration this past year and successfully tissue engineered functional nasal cartilage from patients' own cells. In the future, these regenerative solutions will have an immense impact on surgical reconstructive options for patients with defects of the head and neck due to cancer, trauma and congenital conditions.
- **Advanced Technologies for Surgical Intervention:** This year was spent researching the benefits of using digital surgical planning for dental implants. These types of implants are often used during dental reconstruction following jaw cancer treatment. Research results showed that 97 per cent of dental implants were used when patient cases were digitally planned before any surgical intervention, compared with only 76 per cent when planning was not used and implants were placed using best judgement during surgery. Based on these findings, the outcome of digital surgical planning is a substantial cost savings to the healthcare system.
- **Outcomes and Analytics:** This year was spent developing a mobile swallowing therapy device, the Mobili-T, to improve dysphagia (difficulty swallowing) in patients with head and neck cancer. Over the past year, the research team miniaturized the electronic muscle sensor and its associated computers, changing it from the size of a refrigerator to that of a small pod that fits easily underneath a patient's chin. The Mobili-T connects wirelessly to a patient's mobile device and detects 95 per cent of swallows without any clinician input. The first clinical trial with the Mobili-T will begin later in 2016.
- **Implantable Hearing Solutions:** A team is developing new assessment techniques for completely implantable bone conduction hearing solutions. Previous measurement techniques were developed for hearing devices that connected to an implant that penetrated the skin behind the ear. However, new bone conduction devices connect to the patient via a magnet under intact skin. This provides a new challenge for clinicians because they no longer have a measurement point (i.e., the implant) to determine the device's output for the patient. The research team has developed a new sensor to address this. The sensor has passed pilot testing and two international collaborators in Sweden and Denmark are independently evaluating the sensor.

3.2.7 LIBIN CARDIOVASCULAR INSTITUTE OF ALBERTA

The Libin Cardiovascular Institute and Department of Cardiac Sciences published more than 400 manuscripts last year. The institute's members span the spectrum from generalist scientists doing important mechanistic work to population health scientists evaluating systems of care. Members work in collaboration with the University of Calgary and AHS with the goal of improving patient care.

Research highlights:

- **New Technology:** Dr. James White headed up studies using the new 3.0T Siemens Prisma Cardiac MR scanner in the Stephenson Cardiac Imaging Centre.
- **World's Smallest Pacemaker:** Studies began evaluating the world's smallest pacemaker led by Dr. Derek Exner. This leadless pacemaker is implanted directly into the heart.
- **Improving Heart Function after Trauma:** Dr. Paul Fedak finished animal studies demonstrating the utility of a biological patch placed on the heart to improve its function following a heart attack. This proof of concept study allowed a pilot human study to go forward.
- **APPROACH database expansion:** A heart failure module was added to the database, expanding the utility of this nation-leading software platform to track cardiovascular outcomes.
- **National Guideline Development:** Libin members are leading the production of national guidelines for the Canadian Cardiovascular Society in the area of thoracic aortic diseases (Dr. Jehangir Appoo), heart failure (Dr. Jonathan Howlett) and dyslipidemia treatment. Several members were also responsible for diabetes and hypertension guidelines. Dr. Robert Sheldon chaired the guideline committee internationally in the area of syncope and postural tachycardia.
- **Kidney Disease Pathway:** Dr. Brenda Hemmelgarn and team rolled out a chronic kidney disease pathway to assist primary care physicians in diagnosing, preventing and treating patients with kidney disease.
- **Fainting Clinic:** Studies of syncope (fainting) paved the way for the opening of a world-class syncope and autonomic dysfunction clinic at the South Health Campus, led by Dr. Satish Raj and Dr. Robert Sheldon.



Researchers look to genetics to try to understand fainting

Between 35 to 40 per cent of Canadians experience syncope, or fainting. Calgary researchers are conducting a study to pinpoint possible genetic causes for this common and debilitating condition.

<http://www.albertahealthservices.ca/news/Page11450.aspx>

3.2.8 MAZANKOWSKI ALBERTA HEART INSTITUTE

Last year, the researchers at the Mazankowski Alberta Heart Institute performed research spanning from basic science investigations, such as the development of new treatments for high cholesterol, heart failure and heart scarring, to the most advanced patient-based developments, including:

- **New approaches to heart transplantation, such as the repair of borderline quality hearts (at risk of early failure after transplant) before implantation**

- **Identification of diabetic patients at risk of heart attacks**
- **New methods of lowering high blood pressure in the lungs of patients affected by pulmonary hypertension**

Research highlights:

- **Reducing chemo-related heart failure:** A new area of research for the department focused on identifying therapies to reduce the occurrence of heart failure in patients undergoing chemotherapy for various cancers. Many chemotherapeutic agents cause substantial damage to the heart. This means cancer survivors often develop advanced heart failure, exchanging one type of terminal disease for another. Researchers identified therapies with a substantial probability of improving heart function in patients who have received several cycles of chemotherapy.
- **Post-cardiac surgery rehab:** Mazankowski researchers studied the benefit of exercise and rehabilitation on the survival and complications of patients who receive cardiovascular procedures. In a seminal publication, the investigators of the Mazankowski Alberta Heart Institute showed that patients of Asian and South East Asian background historically attended rehabilitation more often than Caucasians and derived a higher survival benefit from it than patients of European descent. Researchers hope these data will encourage physicians to promote the benefits of rehabilitation activities, which are a cost-effective means of limiting the delayed complications of heart attacks and cardiac procedures.



Pre-hab for cardiac patients makes them fitter for surgery

Getting into the best possible shape physically and emotionally prior to surgery makes recovery easier. Patients who opt to take part in coronary pre-hab can look forward to shorter hospital stays, fewer complications and faster healing.

<http://www.albertahealthservices.ca/news/releases/2015/Page12710.aspx>

3.2.9 MCCAIG INSTITUTE FOR BONE AND JOINT HEALTH

The McCaig Institute is home to a multidisciplinary team of scientists, engineers, clinicians and health system researchers who conduct world-class research to enhance the prevention, diagnosis and treatment of bone and joint conditions.

Founded in 2008, the McCaig Institute has more than 50 research and 80 trainee members from the University of Calgary and the University of Alberta.

Research highlights:

- **Centre for Mobility and Joint Health:** Officially opened in the fall of 2016, the McCaig Institute's new \$17.9 million Centre for Mobility and Joint Health (MoJo) features state of the art imaging, movement assessment and diagnostic equipment that will be used by researchers to assess individual bone and joint health. Guided by clinical needs identified by AHS, researchers in the MoJo work with physicians and patients to develop new technologies for prevention, early diagnosis and novel treatment of bone and joint conditions.
- **Prevention:** A research study taking place in the Bone Imaging Laboratory examines the effects of vitamin D supplements on bone health. Using high resolution imaging equipment, they can look at the microstructure

of bones in detail. Using a customized 3D imaging system, the Clinical Movement Assessment Lab has the capacity to take high speed images of joints while they are in motion. These motion patterns help researchers monitor changes in mobility and identify risk factors early so that appropriate, patient-specific interventions can be developed before long-term damages occur.

- **Early, Accurate Diagnosis:** A McCaig Institute research team has developed a series of blood tests that provide a specific immune fingerprint of autoimmune and rheumatic diseases, allowing physicians to diagnose inflammatory and autoimmune diseases much earlier in their development. Once the specific disease is identified, targeted treatment can begin to prevent or slow its progression.
- **Novel Treatments:** McCaig Institute scientists are developing new treatments for arthritis that use a patient's own stem cells to repair their damaged cartilage. Researchers are working to determine which stem cells have the greatest repair potential, while also ensuring these therapies pose no risks to patients suffering from arthritis.

3.2.10 O'BRIEN INSTITUTE FOR PUBLIC HEALTH

With a vision of better health and healthcare, OIPH aims to inform the public health agencies and health systems tasked with making and keeping Albertans healthy. It does so by focusing its research on enhanced health systems performance, improved population health and innovative tools and methods for public health. AHS leaders contribute to OIPH's governance structure and working committees. One-third of OIPH's membership is comprised of AHS employees.

Research highlights:

- **Calgary Urban Project Society (CUPS) Coordinated Care Team Program:** The CCT Program, a two-year pilot project being implemented by CUPS and shaped by O'Brien Institute members, Dr. Gabe Fabreau, Dr. Kerry McBrien and Dr. Van Nguyen, aims to reduce the need for frequent visits to hospital emergency rooms by homeless and vulnerable populations. A case management team, based at the Foothills Medical Centre emergency room, assesses complex patients, identifies their needs and determines a path of treatment to help them move beyond repeat and frequent visits to the hospital. The team provides individual knowledge and physical support to these patients, many of whom struggle with homelessness, addiction, mental illness, complex health problems and lifetimes of trauma, in addition to cognitive, mental and physical disabilities.
- **Spectrum MD:** Spectrum MD is a new app developed with the support of O'Brien Institute members that is being used in Calgary hospitals to curb antibiotic resistance. The app is the result of collaboration between a Calgary software development group and a multidisciplinary team from the University of Calgary and AHS. The app allows health-care professionals to input select patient information and receive treatment recommendations specific to that patient. In addition, because guidelines and microbial prevalence differs among cities and provinces, the app can be customized to include stats for specific locations to incorporate local sensitivity patterns. Currently, customizable microbial profiles are available for hospitals throughout Calgary. The app is being used in all of Calgary's adult hospitals and will be available soon in paediatrics. A utilization study is currently being completed in the adult critical care units.
- **Inner City Health Agency Needs Assessment:** The "Inner City Community Engagement Pilot Needs Assessment" (June 2015 - March 2016) is a study of 23 participants, including 14 AHS physicians, who examined collaboration among inner city agencies serving the health needs of Calgary's most vulnerable citizens and the Cumming School of Medicine. The study revealed the need for structural change in health professions to overcome barriers for marginalized populations. Specific study recommendations made to the Cumming School of Medicine are to:
 - **Streamline medical billing**
 - **Streamline medical student placements**
 - **Translate knowledge to communities more efficiently**
 - **Better recognize community skills and assets**

- Evaluate student-run clinics
- Establish more flexible partnership arrangements for inner city health clinical and non-clinical work

3.2.11 WARD OF THE 21ST CENTURY

Since 2004, W21C has been at the heart of health services research, working with academia, health systems, government and industry to bring new ideas into healthcare. As a program based out of the University of Calgary's O'Brien Institute for Public Health, this interdisciplinary team addresses healthcare needs through evidence-based practice, technology evaluation and education outreach – driving change in the health system to enhance patient safety and quality of care. W21C had a highly productive year, with nearly 70 active projects underway.

Research highlights:

- **Multi-dimensional Program Evaluation of Alberta's Strategic Clinical Networks:** This project, funded by an Alberta Innovates – Health Solutions/Collaborative Research and Innovation Opportunities grant, is exploring SCN effectiveness. While work on the project is still underway, preliminary results from 15 observations, 71 document reviews, 424 surveys and 117 interviews have been communicated back to the SCNs. Some of the key recommendations to-date:
 - Encourage meaningful engagement and enhanced communication with the broader community by understanding the needs of patients, families and zones and match innovation to meet those needs
 - Use multi-stakeholder engagement to promote innovation and the use of evidence to inform decisions
 - Create opportunities to help clarify and put into action the SCN mission and vision at multiple levels, including patients and families, providers, SCNs, AHS and the government
- **Evaluation of Alternative Care Provider Clinic for Severe Sleep Disordered Breathing:** This project, currently underway at the Foothills Medical Centre Sleep Centre, is exploring if an alternative care provider (ACP) respiratory therapy clinic for patients with severe sleep disordered breathing is not worse than physician-led care with respect to clinical outcomes at three months and one year after treatment initiation. While data collection is still ongoing, preliminary analysis of three-month data has found that the ACP clinic can improve timely access without compromising the clinical care received. Based on the preliminary findings, additional supervised clinics have been added to expedite the care of this population.



Battle against bedsores takes a promising turn

Pressure ulcers are one of the most common complications in hospitals, often experienced by patients who spend extended periods of time in bed or sitting down. Researchers at Foothills Medical Centre are trying to change that.

<http://www.albertahealthservices.ca/news/features/2015/Page11347.aspx>

3.2.12 WOMEN AND CHILDREN'S HEALTH RESEARCH INSTITUTE (WCHRI)

The Women and Children's Health Research Institute (WCHRI) celebrated its tenth anniversary in 2016. For the last decade, WCHRI has been dedicated to supporting research excellence that improves the health and lives of women and children. With partnership from AHS, the University of Alberta, Stollery Children's Hospital Foundation and the Royal Alexandra Hospital Foundation, WCHRI is the only research institute in Canada to focus on women's, children's and perinatal health. Research highlights:

- **Awarding \$4.3 million in research grants and supports through a number of programs:** including two programs that promote research integration in hospitals: the Research Capacity Building Program and the Clinical Research Seed Grant
- **Supporting nearly 100 undergraduate, graduate and post-graduate trainees:** through studentships, research grants and travel grants as part of WCHRI's ongoing investment in the next generation of researchers
- **Providing high-caliber, affordable support:** to more than 100 research projects through WCHRI's Support Platforms for Integrated Research
- **Developing MyChildALBERTA:** by partnering with Maternal Newborn Child and Youth SCN and the Alberta Centre for Child, Family and Community Research. MyChildALBERTA is a child-focused data analytics platform that links multiple data sets to better understand issues faced by children with complex medical conditions.
- **Growing membership:** to more than 450 leading researchers committed to women and children's health

Specific examples of WCHRI research support:

- **Dr. Andrew Mackie:** was awarded a WCHRI research capacity building award, funded through the Stollery Children's Hospital Foundation, which brought together a team to study single ventricle heart disease and develop a rehabilitation program. The Stollery Children's Hospital has one of the highest survival rates because of improvements to care over the past 10 years. WCHRI aims to extend research beyond survival to make a real difference in quality of life.
- **Dr. Jane Schulz:** directs the urogynecology clinic at the Lois Hole Women's Hospital, helping women who suffer from urinary and bowel incontinence and pelvic floor disorders. Incontinence is underreported and undertreated because of continuing social stigma. It results in significant impacts on individual sufferers, as well as an indirect cost to families, society and the economy. Her ground-breaking research, which ultimately supported the development of a perineal care clinic, was funded through the Lois Hole Hospital for Women.

3.3 ALBERTA STRATEGY FOR PATIENT ORIENTED RESEARCH SUPPORT UNIT (ABSPORU)

The AbSPORU is a virtual network of services, expertise and resources providing support to increase the quantity and quality of patient-oriented research in Alberta and the Northwest Territories. It is a five-year, \$48 million provincial-federal partnership by Alberta Innovates – Health Solutions and Canadian Institutes for Health Research to advance knowledge that will improve patient health and healthcare delivery.

This initiative engages patients as partners, focuses on patient-identified priorities and works to improve patient outcomes. The foundation of AbSPORU is strong partnerships among AHS, Alberta Health, Alberta Innovates – Health Solutions, Athabasca University, the University of Alberta, the University of Calgary, the University of Lethbridge and patients.

In the summer of 2015, the unit held the first AbSPORU Summit, where researchers, administrators, patients and representatives from the Alberta government and the SCNs gathered to determine the services the platforms would offer. Thereafter, AbSPORU launched services available to researchers in the areas of enhanced data resources, methodological support, training and state-of-the art knowledge translation. Patient partners on the AbSPORU Steering Committee contribute to the oversight and direction of the initiative. In the upcoming year, AbSPORU will continue to support a culture of patient-oriented research that improves patient health outcomes and enhances patient healthcare experiences.

3.4 CLINICAL RESEARCH ACTIVITY IN AHS

A tremendous amount of health research and innovation occurs every day within AHS. In 2015/16, more than 1,200 new clinical research projects within AHS were approved by Alberta's three main Research Ethics Boards. In total, there are more than 3,500 active research projects ongoing within AHS.

The administration of these studies occurs through three centres of expertise:

- **Alberta Cancer Clinical Trials (ACCT):** The Clinical Trials Units (CTUs) within the AHS Cancer Control Alberta program continue to focus on making cancer clinical trials an integral part of cancer care by increasing the opportunity for patients to participate in clinical trials and improve their disease outcome. This year, 1,075 people participated in trials, a 14.6 per cent increase from the previous year, and 103 new trials opened in Alberta. Some highlights include:
 - **The Cross Cancer Institute (CCI) clinical trials team received a Phase III Team excellence award. This award was based on accrual metrics both overall and for this past year, compliance metrics and local activation timelines. With 60 patients registered, the CCI has the second highest overall accrual globally and the highest in North America. The objective of this study is to evaluate the impacts of a physical activity program on disease-free survival in patients with high risk stage II or stage III colon cancer.**
 - **Drs. Nawaid Usmani and Bernie Eigl were awarded a \$1.5 million Movember Translation Acceleration Grant to examine the ability of metformin to prevent metabolic syndrome in patients undergoing intermittent androgen deprivation therapy for prostate cancer.**
 - **The Tom Baker Cancer Centre (TBCC) clinical trials team was recognized by the Canadian Cancer Trials Group with an award for their exceptional efforts in achieving excellent local activation times, accrual metrics and compliance metrics.**
- **Calgary Centre for Clinical Research (CCCR):** is a clinical trial and epidemiology coordination facility jointly funded by the Cummings School of Medicine and AHS to support investigators. The Centre facilitates and streamlines the processes for initiating clinical trials between the university and AHS. Through the collaboration, the CCCR enables clinicians and scientists to work together more efficiently on clinical research and to bring the most innovative ideas directly to patients.

In 2015/16, the Cummings School of Medicine and AHS launched the Clinical Research Fund to support University of Calgary investigators. Designed to support high impact clinical studies that improve health or influence clinical practice and healthcare delivery, the 2015/16 competition awarded:

- **A major grant to support projects that inform clinical practice and clinical trials research projects**
- **12 seed grants to support new ideas and early career investigators**
- **10 pre-submission grants for planning and pilot work that can result in the submission of a peer-reviewed clinical research application and industry support for a clinical research**
- **Northern Alberta Clinical Trials and Research Centre (NACTRC):** is a joint venture between AHS and the University of Alberta to support clinical research in Edmonton and area. In 2015/16, NACTRC provided legal review and administration for 518 new clinical studies. NACTRC also coordinated 1,411 operational approvals in Edmonton area facilities.

NACTRC also offers investigator support in areas such as biological safety, bio statistical modelling, protocol development, research data management (REDCap), medical records access, Health Canada clinical trial applications, research coordinator training and programs such as Summer Student Support and the Clinical Investigator Program.

AHS works closely with our university partners to administer health research. Through these arrangements, the majority of funding is administered by the universities. This funding includes all federal and international grants. Table 1 summarizes the types of funding held and administered by AHS on behalf of researchers between 2012 and 2016. AHS holds and administers:

- Per our agreement with the University of Alberta, industry sponsored funds for clinical research on behalf of their researchers
- Industry sponsored funds for clinical research conducted at the Tom Baker Cancer Centre in Calgary
- Funding from AHS administered foundations or government bodies

TABLE 1: RESEARCH REVENUE

	Other Grants (Including Industry) ^a	Alberta Health	Other - Provincial Government ^b	Donations ^c	Investment Income ^d	Other Revenue ^e	Total Revenue
2012	\$25,205,480	\$0	\$6,142,446	\$10,670,151	\$87,107	\$4,963,087	\$47,068,271
2013	\$24,350,375	\$0	\$3,861,107	\$10,226,494	\$52,123	\$6,420,125	\$44,910,224
2014	\$30,651,987.19	\$0	\$7,616,346	\$8,212,484	\$35,852	\$4,055,576	\$50,572,246
2015	\$29,465,181.52	\$0	\$4,279,903	\$6,528,095	\$44,987	\$4,805,784	\$45,123,950
2016	\$32,543,379	\$7,500,000	\$3,831,752	\$8,960,415	\$1,273	\$1,778,268	\$54,615,087

Source: AHS Finance Revenue

^a Includes industry-sponsored studies such as pharmaceutical trials

^b Any Alberta ministry or agency excluding Alberta Health

^c Donations for research purposes

^d Interest income held for funding

^e All other revenues not including those in the other categories

3.4.1 ADULT ONCOLOGY

Alberta's Tomorrow Project (ATP): Based in Cancer Control Alberta at AHS, this research platform developed comprehensive procedures and guidelines to facilitate access to its repositories of biological samples and lifestyle/behavior data. About 30,000 cancer-free Albertans donated biological samples (e.g. blood, urine) and around 50,000 have contributed data concerning their lifestyle, behavior and general health. Participants have given consent for use of their data and samples by qualified investigators who have research questions that advance knowledge in cancer and chronic disease etiology or early detection. ATP is a health-related resource that aims to liberate data.

Cancer Epidemiology and Prevention Research: The Department of Cancer Epidemiology and Prevention Research (CEPR) of Cancer Control Alberta studies the underlying causes of cancer and means of cancer prevention.

Led by Dr. Christine Friedenreich, the CEPR department held \$3.13 million in external grant funding in 2015/16, and an additional \$2.70 million in external funding from collaborative projects. CEPR scientists published 24 papers in scientific journals over the past year and had 35 oral and poster presentations at scientific conferences.



Study shows almost half of cancers are preventable

About 45 per cent of cancer cases in Alberta are linked to a handful of modifiable factors, including tobacco, inactivity, unhealthy eating, excess body weight and alcohol. A new study shows more than 6,700 cancer cases in Alberta can be avoided per year by changing these factors.

<http://www.albertahealthservices.ca/news/releases/2016/Page12960.aspx>

3.4.2 COVENANT HEALTH RESEARCH CENTRE (CHRC)

Covenant Health is Canada's largest Catholic healthcare provider with a 150-year history of providing care to Albertans. As a major service provider within Alberta's integrated healthcare system, Covenant Health's unique focus is on four of the most vulnerable populations: seniors, mental health and addictions, palliative end-of-life and rural care.

The CHRC promotes innovation, facilitates inquiry, develops partnerships and integrates research into practice. This year, CHRC again focused on working with its partners through the Alberta Clinical Research Consortium to reduce barriers and streamline processes for conducting clinical research.

Research highlights:

- **Research Day:** Producing the 11th annual Covenant Health Research Day event held at the Grey Nuns Community Hospital, bringing together staff and practitioners from Covenant Health and participants from six other organizations across Alberta
- **Grants:** Awarding more than \$35,000 in seed and research grants to eight different projects
- **Award Sponsorship:** Recognizing excellence in nursing research by sponsoring the Advancement of Nursing Research Award, awarded to Dr. Karen Benzies for her work in early childhood development and parenthood
- **Research Studies:** Reviewing and approving 97 research studies, of which 59 studies were led by Covenant Health primary physicians, allied health practitioners and nurses

4. INCENTING RESEARCH AND INNOVATION OF THE HIGHEST VALUE TO ALBERTANS

Albertans interact with our healthcare teams every day. Each encounter offers an opportunity to learn and improve. Working together, we can address potential gaps in care by gathering research evidence, sharing knowledge with our partners and creating innovative solutions.

4.1 IDENTIFYING HEALTHCARE CHALLENGES

As engines for research and innovation in the provincial health system, the SCNs engaged with many clinicians, patients and partners to identify key health system challenges that require the talent, knowledge and expertise of many individuals to improve. Examples include:

- **Developing clinical care pathways to reduce practice variation:** Clinical care pathways outline a sequence of activities for specific diagnosis groups or patient populations in order to maximize quality of care, efficient use of resources and improve transitions of care. The pathways developed in 2015/16 include hip fracture, colorectal cancer, head and neck cancer surgery, community-based diabetic foot care, heart failure, chronic obstructive pulmonary disease, pediatric asthma, depression, pancreatoduode-nectomy/hepato-pancreatic-biliary (liver), chronic kidney disease and emergency clinical knowledge.
- **Co-developing solutions with industry partners:** In January 2016, the SCNs and MEDEC, the national association of the Canadian medical technology industry, met to explore how clinicians and industry could identify – or, if needed, create – innovative solutions to local clinical challenges. The event was organized by Alberta Innovates – Health Solutions in partnership with AHS, MEDEC and the Institute of Health Economics.
- **Transformational Roadmaps to guide decisions regarding the future of care:** The roadmaps become an important criterion to inform the types of research (new evidence) and innovations that will help transform how care is delivered.

4.2 ALBERTA PARTNERSHIP FOR RESEARCH AND INNOVATION IN THE HEALTH SYSTEM (PRIHS)

PRIHS is a partnership between Alberta Innovates – Health Solutions (AIHS) and AHS aimed at improving health outcomes for patients across Alberta. This partnered funding opportunity supports networks of health researchers and clinical practitioners across the continuum of care, with an emphasis on population health and community and primary care. The goal is to reassess potentially inefficient activities within the health system and identify sustainable solutions to improve overall quality of care and value for money in the health system.

The objectives of PRIHS are to:

- **Support SCN research and innovation activities that focus on (re)assessing technologies, services and processes in Alberta's health system with the aim of improving care efficiency**
- **Enable AHS to make evidence-informed clinically appropriate changes to the healthcare system**
- **Build capacity for health research activities**
- **Encourage collaboration of research and innovation activities between Alberta's academic institutions, SCNs and AHS operations in order to achieve measurable and sustainable impacts in the health system**

In 2015/16, AHS and AIHS launched a new PRIHS competition focused on implementing innovative solutions and/or new models in care that improve appropriateness and efficiency¹ in one or more of the following areas:

- **Transitions in care**
- **People with complex or high needs**

- **Appropriate use of therapeutics**
- **Appropriate use of diagnostic tests**

More than 38 letters of intent were submitted for adjudication. Eight applicants were selected to submit a full application by March 31, 2016. Final decisions will be announced in June 2016.

¹The *Alberta Quality Matrix for Health* identifies six dimensions of quality and four areas of need.

5. LIBERATING HEALTH SYSTEM DATA

One benefit of being the largest fully integrated health system in Canada is that AHS collects a significant volume of clinical and corporate data and health information that can be used to examine disease patterns, clinical activities and health outcomes. The provincial scope of our data covering the entire continuum of care gives staff and researchers a stronger ability to answer questions of relevance to Albertans. The breadth of data gives Alberta researchers a competitive edge for national and international grants.

5.1 PROVIDING ACCESS AND SUPPORT TO MEASURE PATIENT-REPORTED OUTCOMES

AHS has partnered with the Health Quality Council of Alberta (HQCA), the University of Alberta (U of A) and the EuroQol Foundation to support Alberta-based clinicians, health system leaders and researchers in their use of EQ-5D instruments and other patient-reported outcome measures (PROMs). This support is provided through a dedicated office at the U of A called APERSU (Alberta PROMs and EQ-5D Research and Support Unit).

PROMs are an essential component in supporting a patient-centred approach to care, as they allow outcomes to be measured directly from the patient's perspective, providing a valuable supplement to other clinical outcome measures (mortality, morbidity, etc.). Data are captured before and after a specific service (e.g., a surgery or treatment plan) and are used to measure the impact of that service on the patient's quality of life.

The EQ-5D is an easy-to-use, standardized instrument that captures a patient's self-reported health status across five dimensions (mobility, self-care, usual activities, pain/discomfort and anxiety/depression), and is licensed through the EuroQol Foundation.

APERSU provides advice and training on the use of EQ-5D instruments and other PROMs, as well as additional supports including registration and licensing of the EQ-5D instruments, scoring EQ-5D data and providing basic descriptive results.

5.2 ENHANCING DATA-DRIVEN DECISION MAKING

AHS leads the Canadian healthcare sector with the largest system-wide interactive reporting system – Tableau®. This system provides leaders and frontline staff with a better way of seeing and understanding our health system data. As seen in Figure 2, more people have accessed their data, more reports/dashboards have been consumed and more data has flowed through Tableau than ever before.



Figure 2: Tableau usage in 2015 compared to 2016

This is the culmination of two years of groundwork to empower analysts and connect information consumers to their data. Analysts have embraced Tableau because it increases their productivity and enhances their ability to speed up the 'data to insight' process. Information consumers have appreciated the single access point for content, the high level of interactivity and the timeliness of reporting.

5.3 EXPANDING MEASUREMENT OF PATIENT EXPERIENCE

In October 2015, AHS implemented a pediatric inpatient experience survey, the Child Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS). The Child-HCAHPS is a proxy telephone survey conducted with the adult family member who is most familiar with the child's hospital stay. The survey examines various aspects of hospital care, including responsiveness of healthcare providers, communication, pain management, safety, family needs, hospital environment and discharge preparation. About 2,400 surveys will be collected annually from 14 AHS hospital sites. Survey results, which are available for clinical and administrative staff via interactive dashboards, are used to benchmark pediatric inpatient experience between AHS hospitals, and can also be used to support initiatives for improving the quality of inpatient care.

In addition to the pediatric inpatient experience survey, AHS also administers the adult version of HCAHPS, which collects 23,000 surveys annually from adult patients discharged from AHS facilities. Results from this survey are available as a publicly-reported performance measure on the [**AHS website**](#) (satisfaction with hospital care).

5.4 SECONDARY USE DATA PROJECT

When Albertans interact with research, health, and social services programs, information is gathered about them and stored in huge provincial information systems. The data in these information systems can be used for further research studies that help researchers understand how Albertans get healthy and stay healthy. However, the data is not widely available for sharing with researchers and quality improvement experts.

Alberta Innovates – Health Solutions, AHS and Alberta Health were among 18 public and private organizations that worked together to complete Phase 1 of the Secondary Use Data Project between March 2014 and March 2015. More than 70 experts worked together to brainstorm better ways to share and use Albertans' data for strategic planning, policy-making, service delivery, quality improvement and research.

They concluded that in addition to health data, such as age ranges, diagnoses and treatment options, researchers need environmental toxin exposure rates, financial information and geographic information as well as data related to the social determinants of health. The Secondary Use Data Project's collaborative team is developing a secure, safe place where health and health-related data can be used to create new cancer treatments, learn what contributes to good lifelong mental health habits for children, or assist individual Albertans to best manage diabetes.

The project has since sponsored five demonstration projects that will help researchers understand how to bring these provincial information sources together in a privacy-protected and secure manner. When this aim is achieved, researchers and quality improvement experts will use the data to gain insight and produce discoveries that lead to better health and quality of life for Albertans.

The five Demonstration Projects include:

- **Releasing existing aggregate information about the health system that will be privacy protected for use by researchers (Demonstration Project #1)**
- **Bringing together information about the quality of care that Albertans with chronic obstructive pulmonary disease and diabetes are receiving (Demonstration Project #2 and #3);**
- **Examining how data is used to make decisions when plans are made for new health programs and services (Demonstration Project #4-)**
- **Identifying strategies and processes that support researchers and quality improvement experts to quickly gain access to the information they require to answer important health system questions (Demonstration Project #5)**

6. APPLYING AND SPREADING KNOWLEDGE

Our staff are extremely dedicated and learn with our patients every day. As a provincewide health authority, AHS supports our people learning from each other and from colleagues in other organizations. Knowledge management (KM) describes the process of enabling staff to create, share and apply their knowledge toward improving patient care and/or health system performance.

6.1 AHS RESEARCH CHALLENGE

The *AHS Research Challenge – Better Care through Research* was launched in 2016 to help frontline healthcare providers get answers to their patient care questions. The Challenge provides education and mentoring to help clinical staff with minimal research experience develop the skills needed to answer their clinical care inquiries.

Nurses, dietitians, physiotherapists, occupational therapists, speech language pathologists and more made up 126 multi-disciplinary teams who submitted Letters of Intent for the Challenge competition. From those submissions, the expert review panel chose just 12 teams. A sampling of questions from the successful teams:

- **What are the impacts of nurse practitioner involvement in the care of palliative/end of life clients in a community (supportive living) setting?**
- **How do treatment length, frequency and overall time affect improvement rates among preschoolers with speech sound disorders?**
- **Do patients with multiple sclerosis benefit from using a powered exoskeleton?**
- **Does nursing education increase the confidence of rural callers in caring for pediatric patients with fever?**
- **What is the prevalence, practices and management of malnutrition in rural areas and what are the opportunities to improve practice?**
- **Do women with stress urinary incontinence, referred for physiotherapy, improve with resisted hip rotation exercises versus standard care alone?**

Over the coming year, the teams will conduct their research, implement and share their findings through a conference presentation and publish their results.

AHS has a system-wide mandate to enable the highest standards of research and evaluation, and to ensure that high quality knowledge is used to inform system sustainability, better practice and improved health outcomes for Albertans.

6.2 GRANTS AND PUBLICATIONS

Scientists and experts directly affiliated with Research, Innovation and Analytics portfolio or the Strategic Clinical Networks supported or led 199 grant applications as collaborators (50), co-investigators (13) and principal investigators (6). To-date, successful grants have totaled more than \$21 million, while an additional \$11 million in submissions are pending review results.

Research initiatives by these individuals resulted in 165 peer-reviewed publications and 133 Evaluation Project Reports.

SCN STUDENTSHIPS

Studentships at the University of Alberta	18
Studentships at the University of Calgary	17
Other	1

SCN SEED GRANTS

Seed grants at the University of Alberta	13
Seed grants at the University of Calgary	18
Other	4

6.3 SCN STUDENTSHIPS AND SEED GRANTS

Studentships and seed grants are important tools to create research capacity building with Alberta's leading universities. Funding for these projects was delivered through 36 studentships and 35 seed grants.

6.4 COURSES AND WORKSHOPS

During the past year, AHS partnered with leading Alberta academic institutions to create and offer accredited courses in biostatistics and health economics. Within AHS, members of the research team provided about 56 lectures and workshops, reaching more than 850 individuals to provide research-based certificate programs.

As well, the SCN Health Economics course, delivered over six months, aimed to increase the capability of individual SCNs to incorporate value-for-money methodology into their priority work, focus on improving healthcare quality and transform the healthcare system. The Health Economics course was the result of a partnership between AHS and the Health Economics Program at the University of Calgary. Twelve SCN project teams shared their learnings with a large, high-level audience at the conclusion of the course.

7. INNOVATING TO ACHIEVE SERVICE EXCELLENCE

Research breakthroughs, innovation and new knowledge must be stewarded to the point where they generate tangible, real-world clinical value. This may involve spreading knowledge, enabling inventors to bring their ideas into the marketplace and having a culture where taking on new challenges to achieve service excellence is critical.

7.1 PRESIDENT'S EXCELLENCE AWARDS

The ***President's Excellence Awards*** honour and recognize the exceptional AHS staff, physicians and teams who live AHS values and demonstrate innovation, collaboration and patient focus. Selected from a record 99 nominations, representing the work of more than 1,228 AHS staff and physicians, this year's recipients are:

- **Outstanding Achievements in Research:** Escape Trial Team: Based in Calgary, this team demonstrated that an endovascular treatment (ET) can dramatically improve patient outcomes after an acute ischemic stroke. Positive patient outcomes increased from 30 to 55 per cent when applying ET. As well, mortality rates were reduced from two in 10 patients to one in 10 patients – a 50 per cent reduction.
- **Outstanding Achievements in Innovation:** The Addiction Recovery and Community Health (ARCH) Team: The ARCH Team was launched in 2014 to provide patient-centered, evidence-based and holistic care for Royal Alexandra Hospital patients who are socially vulnerable and/or dealing with substance use. Using an interdisciplinary approach, ARCH provides innovative care and support such as brokering access to housing, income support and applying evidence-based addiction medicine. More than 1,078 unique patients have been supported to-date.
- **Outstanding Achievements in Quality Improvement:** Child Development Services Autism Spectrum Disorder Diagnostic Clinic: The prevalence of Autism Spectrum Disorder in Canada has doubled in the last 10 years, challenging care teams to provide timely diagnoses. In 2013, with a patient wait time of more than one year, the ACH team embarked on a quality improvement project to reduce wait times. These efforts reduced the wait time to one month and reduced the time to complete a diagnosis by 40 per cent.
- **Outstanding Achievements in Health and Safety:** Nutrition, Food, Linen and Environmental Services Safety Champion Network: This network of AHS staff aimed to engage frontline workers in making healthy and safe workplaces. Through a safety champion model, the network now has nearly 300 safety champions across the province. The network mobilizes staff to support workplace health and safety improvements.
- **Distinguished Service - Dr. Bruce Macleod, RAAPID South Medical Director:** Dr. MacLeod has a history of supporting others to disclose when harm occurs to patients. This can be one of the toughest conversations in healthcare. He led the creation and authorship of Disclosure of Unanticipated Medical Outcomes policy and procedures. Dr. MacLeod is dedicated to ensuring Just Culture principles are integrated into staff orientation manuals, patient safety training courses and other initiatives.

7.2 HEALTH INNOVATION

Technology is a rapidly evolving and dynamic aspect of healthcare. Clinicians are motivated to stay current with the pace of technological innovation in order to provide the best care to patients. Evidence is used to determine which innovations to adopt. Some of the innovations from this year:

- **Epinephrine Overdose:** Epinephrine is used to treat anaphylaxis both in hospital and in the community. While the incidence of a medical error is very low, the consequences to patients could vary from minor to severe adverse reactions. AHS completed a report on the incidence, resource use and costs associated with epinephrine errors. This report helped AHS decide to purchase pre-loaded epinephrine auto-injectors for improved patient safety. This work was successful due to the program's collaboration with Quality and Healthcare Improvement, Pharmacy Services and Emergency Department physicians.
- **Surgical Improvement:** In the fall of 2015, the Surgical Services leadership team at the Stollery Children's

Hospital demonstrated how they could positively impact both healthcare quality and costs by making some operating changes. By increasing the number of surgeries performed with existing operating room capacity, the hospital was better able to meet growing surgical demand, and at the same time, was able to temporarily defer the need to invest in additional costly operating room capacity. Data-driven storytelling can be an effective way to demonstrate how operational managers across AHS are making evidence-informed decisions that improve healthcare quality and costs.

- **Transplant Waitlist Redesign:** The Southern Alberta Transplant Program (SATP) developed a proposal to reform the wait listing process for kidney transplantation. The previous system required routine testing of patients who were far from the top of the transplant list, putting a burden on patients and spending healthcare resources with little or no clinical benefit. The waitlist process was re-designed to reduce unnecessary testing on patients. SATP won a grant from Calgary Zone to pilot their idea.

7.3 ALBERTA CLINICAL RESEARCH CONSORTIUM (ACRC)

The ACRC helps bring the latest diagnostic tools, prevention methods and treatments to Alberta by reducing the barriers to clinical health research, assisting with better use of resources and ensuring a vibrant clinical research environment. Clinical researchers, administrators, the healthcare system, the community and strong partnerships among AHS, Alberta Innovates – Health Solutions, the College of Physicians and Surgeons, Covenant Health, the University of Alberta and the University of Calgary work together to achieve the vision of high quality, integrated, efficient clinical research for Alberta.

In this last year, the ACRC partner organizations continued to build and expand the number of training opportunities through CITI-Canada, as well as tools and resources to assist researchers. These activities promote standardization and capacity in conducting high-quality clinical health research.

Research highlights:

- **Creating Efficiencies:** AHS, Covenant Health and the Information Stewardship Office have identified a common process for Health Information Act research agreements. The process adds clarity and efficiency for researchers by reducing multiple reviews through information sharing between the organizations. To support this process, a common information technology system, EDGE, was implemented for organizations to collaboratively work together on administrative processes.
- **Increasing Opportunities to Participate in Research:** Representatives from the healthcare system, researchers and privacy and patient representatives are working on a provincial framework around how to engage, gather and collect information for individuals who may be interested in being approached about a clinical health research study.



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