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Welcome to the 2017 Allina Health Research annual report.

At Allina Health, we are committed to innovative, collaborative research to transform care and improve the health of the communities we serve.

When we collaborate, our research investments are multiplied. We pursue research with the potential to improve patient outcomes, uncover new models of health care delivery and enhance the health of the communities we serve. Encouraging a culture of collaboration includes reaching across disciplines. Our researchers work diligently to apply research discoveries—all for the benefit of those we serve.

Our research also provides patients with opportunities to participate in leading-edge clinical trials—including those patients with no existing options to treat their disease. By sharing what we learn and working side by side, our researchers break down barriers and set the stage for groundbreaking discoveries.

In this report, you will learn more about our research highlights from the past year. In 2017, we conducted 600 active clinical studies with 3,504 patients enrolled. Our researchers contributed to collaboratively improving health through 221 national presentations and posters, and through 259 peer-reviewed publications. Also in 2017, we reorganized research under a single umbrella and completed a three-year strategic plan that aligns research with Allina Health’s overall strategic priorities.

Our research is supported through internal funding, industry and government support, and through generous philanthropic support. We are grateful to the individuals and entities supporting our research efforts.

On behalf of the entire Research team, we invite you to review our annual report and learn more online at allinahealth.org. We are proud of Allina Health’s collaborative research achievements and the potential our research represents to improve care and save lives.

Tim Sielaff, MD, PhD, FACS
Chief Medical Officer
Senior Vice President
Allina Health

Vani Nilakantan, PhD
Vice President of Research
Allina Health
Research Portfolio 2017

- 7 research councils, 40% increase from 2016
- 600 active studies, 11% increase from 2016
- 259 publications, 28% increase from 2016
- 47 grants, 4% decrease from 2016
- 221 abstracts and presentations, 6% decrease from 2016

Allina Health Research

In 2017, Allina Health Research was organized under a single umbrella in order to achieve the following:

- Expanded visibility and connection to Allina Health strategic initiatives
- Organizational alignment and portfolio support through infrastructure buildout
- Streamlined processes for operational excellence and efficiencies
- Increased opportunities to leverage existing and new capabilities for research support
- Strengthened partnerships with the Medical and Research leadership teams
Allina Health Research | 2017 annual report

- **Revenue:** $12,018,945 (0.5% decrease from 2016)
- **Expenses:** $17,962,919 (2.7% decrease from 2016)
- **Patients enrolled:** 3,504 (124% increase from 2016)
- **Investigators:** 358 (43% increase from 2016)
- **Media stories:** 93

**Sources of funding:**
- Internal (operationally funded): 35%
- Foundation (internal): 14%
- Industry: 41%
- Foundation (external): 3%
- Federal government: 4%
- Other: 3%
Our values

Integrity, Trust, Respect, Compassion, Stewardship

Allina Health Research vision

To be a recognized leader in innovative clinical research that advances health care, improves patient lives and promotes population health in the communities we serve.

Strengthening Allina Health Research infrastructure

A strengthened infrastructure for Allina Health Research offers researchers across the organization the following benefits:

- improved Epic electronic health record research functionality
- increased staff support through design/analysis statistician, contract and grant assistance, and regulatory/compliance leadership
- expanded opportunities for visibility through quarterly Research Town Halls and Annual Allina Health Research Retreat
- enhanced opportunities to emphasize Allina Health’s Whole Person Care, an approach that recognizes all factors impacting health care are connected—mind, body, spirit and community.
Research Oversight Committee

The Research Oversight Committee (ROC) is a cross-functional and multi-disciplinary council designed to provide executive level leadership for Allina Health Research. The ROC is widely represented by stakeholders from different areas including Allina Health Executive Leadership, Research Administration, Research Community, Metro Hospital Medical Affairs, Legal, Finance and Compliance.

Research Directors Roundtable

The Research Directors Roundtable is comprised of the research directors and research administrative leaders. The multidisciplinary group meets regularly to discuss research processes and program initiatives, and to provide input and recommendations to the Research Oversight Committee.

Carmi Anderson
Abbey Arndt, RN
Nilanjana Banerji, PhD
Lori Boland, MPH
Ruth Bryant, PhD, MN, RN, CWOCN
John Dawson, MD
Deb Diskerud
Rachel Foss, RN
JoAn Hall, MA
Kaley Klanica, JD
Gayle Kusch, MSA
Vani Nilakantan, PhD
Sarah Pederson, MBA, MA
Cass Rodgers
Abbey Sidebottom, PhD, MPH
Tim Sielaff, MD, PhD, FACS
Catherine St. Hill, DVM, PhD
Amy Stegner
Karen Swenson, PhD, RN, AOCN
Ned Tervola, MA, ATC
Lisa Tindell, RN, BSN, CCDS, CCRC
New team members

Allina Health welcomed the following employees to the Research team in 2017.

Left to right:
Ginger Carroll, MS, OT/L, research project coordinator, Courage Kenny Rehabilitation Institute
Sarah Pederson, manager, Research Grants and Finance
Ruth Bryant, PhD, MN, RN, CWOCN, director, Nursing Research
Catherine St. Hill, DVM, PhD, principal research scientist, Care Delivery Research
Laura Olevitch, MS, grant program administrator, Research Operations, and clinical innovation grants coordinator, Abbott Northwestern Hospital Foundation
John Nelson, JD, research contract specialist
Andy Roff, JD, research contract specialist

Not pictured:
Gayle Kusch, MSA, director, Human Research Protection Program
Allina Health considers research an essential component of supporting its patients, families and communities. The institutional investment in research provides the necessary infrastructure for advancing research across the organization, and fosters a supportive environment for the research community. Research at Allina Health is organized into clinically-focused Research houses. This structure aligns with and supports the strategic mission of the Allina Health Clinical Service Lines.
Sharon Gowdy Wagener, OTD, OTR/L

Research on quality of life after acquired brain injury and visual impairment

As an occupational therapist with Courage Kenny Rehabilitation Institute for more than 20 years, Sharon Gowdy Wagener, OTD, OTR/L, saw a gap in the research on quality of life for people with vision impairment after acquired brain injury. So, she decided to do something about it.

Ocular impairment (OMI) is reported in 68 to 90 percent of all patients following a traumatic brain injury or stroke. OMI symptoms often include double vision, blurriness, eyestrain and headaches. Various studies have explored the symptoms and patient outcomes of OMI; however, the gap in the literature was an opportunity for Gowdy Wagener to explore patient participation in and quality of life.

“The reason I did this study is there is no existing research that describes what this is like for the patient,” said Gowdy Wagener. “We have seen patients months or years after a brain injury in which an eye movement problem hadn’t been identified.”

With her experience, Gowdy Wagener is keenly familiar with the red flags of eye movement problems. Her research identified the top four life role areas for these patients: working and employment, recreation, education and home management, as well as the individual tasks of reading, computer use and driving. “The visual symptoms are difficult for these patients, but it’s much more complicated than that,” said Gowdy Wagener.

Funded through the Courage Kenny Foundation, Gowdy Wagener has presented her research internally at the Brain Injury Program Rehab Education Series and a state conference—and she plans to present nationally and conduct future research. The results of her research are also being used to update Courage Kenny’s concussion guidelines.

“We have an opportunity to contribute to research because we are such a large organization and a prominent regional resource,” said Gowdy Wagener. “Research drives our own practice, is community-building and provides professional development opportunities for us as health care professionals.”

Gowdy Wagener’s love of education and research ultimately benefits those cared for at Courage Kenny. “This research helps us define the problem and provides us a baseline to move forward. I hope to do more research to address these important questions,” said Gowdy Wagener. “Ultimately, it’s all about how we can improve the quality of care and outcomes for patients.”
On the 10th anniversary of her heart event, a grateful patient recalls her personal journey and the research that made recovery possible

Special events are often commemorated by anniversaries. In 2017 the Minneapolis Heart Institute Foundation® marked the 35th anniversary of its founding. For Lisa, it was the tenth anniversary of her heart event on Oct. 23, 2007.

That day, Lisa collapsed while working alone in her office. A woman working across the hall found Lisa on the floor, turning blue. She called 911 and within a minute was joined by a Delano, Minn. first responder who started CPR.

With the aid of paramedics and numerous shocks from an automated external defibrillator (AED), she was stabilized for transport to Ridgeview Medical Center in Waconia. When Lisa arrived at the hospital, the care team came to the ambulance. Instead of immediately transporting her inside the hospital, they began packing her in ice, part of the COOL-IT clinical trial protocol developed by Minneapolis Heart Institute® physicians through the Minneapolis Heart Institute Foundation®. In this protocol, the core body temperature is cooled to reduce the risk of permanent brain damage from cardiac events.

Lisa was then rushed to Abbott Northwestern Hospital where she was stabilized. While recovering, her heart was not beating consistently and the doctors ordered diagnostic tests. Cardiologists with the Minneapolis Heart Institute® diagnosed her with arrhythmogenic right ventricular dysplasia (ARVD), a genetic condition that is often not diagnosed until after a heart event occurs. Many people with this condition pass away suddenly, and Lisa nearly did. “God must have a purpose for me yet here on earth, because I’m still here. So many things happened that helped me survive,” said Lisa.

Lisa was treated by William Katsiyiannis, MD, of the Minneapolis Heart Institute®, and she received an implantable cardioverter defibrillator (ICD), which she calls her insurance policy. At her most recent check-up, Katsiyiannis complimented her on being a “boring” patient, which is a great achievement 10 years after her heart event.

Lisa retired shortly after her sudden cardiac arrest to spend time with her husband Greg and their three children – Kayla, Mitch and Joel. She also helped raise awareness and funding to provide more AEDs in public places in her city of Delano, helping those in her community improve their chances of surviving a sudden cardiac arrest.
Karen Hobart will always remember May 1, 2013, as the date she was diagnosed with stage three breast cancer. Following surgery, chemotherapy and radiation that year, Hobart is today approaching her five-year anniversary as a cancer survivor.

An occupational therapist by profession, Hobart found her life immensely different following the diagnosis and treatment. “Cancer changes your whole life,” said Hobart. Side effects from medication, anxiety and depression, muscle aches, pain, memory issues from chemotherapy, and changes in relationships with family and friends are all common following a cancer diagnosis and treatment. “It affects your marriage, your family, your friends,” said Hobart. “I also found myself wanting to evaluate my life and my passions after these life-changing experiences.”

That’s where the Compass Course came in—the brainchild of Mary Radomski, PhD, OTR/L, Mattie Anheluk, OTR/L, Joette Zola, OTR, and Jerry Halsten, PhD, Courage Kenny Rehabilitation Institute. Hobart was intrigued by the focus of the course on offering practical steps to help define short- and long-term goals. “This wasn’t a support group,” said Hobart. “Rather, it was a group focused on doing—learning about our passions and how to take steps to implement personal goals in the future.”

Offered as a collaborative partnership between the Virginia Piper Cancer Institute and Courage Kenny Rehabilitation Institute, the Compass Course was an eight-week course offered over four months as part of a research study for breast cancer survivors. Hobart found the Compass Course structure, tools and setting invaluable for redefining her life as a breast cancer survivor. “This course took me out of a slump in my life on finding daily purpose and helped me to set short- and long-term goals that I could not set by myself,” said Hobart. “It helped me develop my purpose vision, self-acceptance and strategies that I can use for the rest of my life.”
CANCER RESEARCH

Virginia Piper Cancer Institute

The Virginia Piper Cancer Institute Oncology Research Program offers patients the opportunity to participate in promising new treatments for cancer within their own Allina Health hospital or clinic. The program’s goal is to become a clinical research referral center in the region by offering high-quality clinical trials for patients with or at risk for cancer.

Virginia Piper Cancer Institute researchers conduct internal research to develop and test methods to enhance care, manage side effects of cancer, and improve the effectiveness of cancer diagnostics and treatments. Researchers also advance oncology care through public forums, presentations at scientific and lay conferences, and publishing study results in professional journals.

An exciting year for cancer research

The focus of clinical trials has shifted away from toxic chemotherapy treatments to more targeted molecular therapies. There have been great advances in understanding the unique molecular fingerprints of each cancer subtype and even the specific tumor targets for an individual patient. Treatments are now being designed and studied to deliver targeted therapy with greater efficacy and fewer side effects. Immunotherapy has also made great strides in successfully treating several different cancers. This treatment enables a patient’s immune system to recognize and destroy the cancer cells growing in their own body, and offers the potential for better outcomes with reduced toxicity.

The Virginia Piper Cancer Institute has 48 active studies with more than 200 patients enrolled. Researchers translate clinical discoveries into clinical practice, making leading-edge cancer treatments and improved care available for Virginia Piper Cancer Institute patients.

Virginia Piper Cancer Institute Research collaboration highlights

The Virginia Piper Cancer Institute collaborated with Courage Kenny Rehabilitation Institute to complete enrollment for its Focus Forward Cognitive Rehabilitation Program for breast and ovarian cancer patients.

The Engelsma Family Foundation funded the “Purpose Project: Reclaiming life purpose after breast cancer” feasibility study. Group sessions with 12 participants were held in September and October 2017. Results are being used to further develop the efficacy study.

The Virginia Piper Cancer Institute conducts collaborative research projects with investigators at Mayo Clinic, the University of Minnesota, Georgetown University and the Pancreatic Cancer Research Team (PCRT).
A selection of Virginia Piper Cancer Institute grants and investigator-initiated projects

ABBOTT NORTHWESTERN HOSPITAL FOUNDATION GRANTS

- Development of oncolytic adenovirus targeting pancreatic cancer stem cells: Collaborative project with the University of Minnesota.
- Registry study to determine the utility and feasibility of a pancreatic cancer screening program for patients at high risk of the disease based on genetics and family history.
- Mayo registry study: An international registry of patients with or at risk for hepatobiliary cancers, including hepatocellular carcinoma, cholangiocarcinoma and gallbladder adenocarcinoma, and those patients with normal risk factors.

ENGELSMA FAMILY FOUNDATION/ABBOTT NORTHWESTERN HOSPITAL FOUNDATION GRANTS

- Evaluation of the pathologic response for patients receiving neoadjuvant chemotherapy for invasive lobular breast cancer.
- Retrospective analysis and focus groups regarding family history data collection at a mammography clinic to refer high-risk patients for genetic counseling: What are the barriers to genetic screening for high-risk women identified at screening mammography?
- Breast cancer diagnosed in young women under age 35: Pathological features, treatments and outcomes.

Michaela Tsai, MD, Martha Bacon Stimpson chair in Breast Oncology, Piper Breast Center, medical director, Virginia Piper Cancer Institute Cancer Research

Michaela Tsai, MD, Martha Bacon Stimpson chair in Breast Oncology, Piper Breast Center, and medical director, Virginia Piper Cancer Institute Cancer Research, and Thomas Amatruda, MD, medical oncologist and clinical leader, Allina Health Melanoma Program, speak at the American Cancer Society – Cancer Action Network Minnesota Research & Innovation breakfast held at Allina Health Commons on Nov. 7, 2017
CARDIOVASCULAR RESEARCH

Minneapolis Heart Institute Foundation®

The Minneapolis Heart Institute Foundation® is an independent, nonprofit 501(c)(3) cardiovascular research organization with a 35-year history. The Foundation conducts clinical research into all facets of heart and vascular disease, and disseminates its findings throughout the region, country and world in order to change the way cardiovascular disease is prevented, diagnosed and treated.

The Minneapolis Heart Institute Foundation® works closely with the Minneapolis Heart Institute® at Abbott Northwestern Hospital, which provides close access to a diverse patient population and keeps research staff informed about the latest in the diagnosis and treatment of cardiovascular disease.

The Foundation’s work is funded by generous donors and sponsors to support research initiatives of the Minneapolis Heart Institute® at Abbott Northwestern Hospital. Minneapolis Heart Institute® physicians provide care for patients at Abbott Northwestern Hospital in Minneapolis and at 38 community sites across Minnesota and western Wisconsin.

Scientific innovation and research

The Minneapolis Heart Institute Foundation® is a recognized research leader in the broadest range of cardiovascular medicine and population health initiatives. Each year, the Foundation leads more than 175 active research projects and publishes more than 175 peer-reviewed abstracts. Cardiologists, hospitals and communities around the world adopt its protocols to save lives, improve care and create healthier living opportunities.

Education and outreach

The Minneapolis Heart Institute Foundation® provides more than 10,000 hours of education each year, putting its research into practice to improve outcomes. Its leading-edge, transformative population health research connects, engages, informs and empowers individuals and communities to improve their health.
Training the next generation

The Minneapolis Heart Institute Foundation® offers one of the most prestigious and proven research internship opportunities available to undergraduate pre-medical students and those studying in other health care disciplines. Working with physician and research staff mentors, interns contribute to clinical research studies and publications that impact patient care.

Each year, the work of interns results in more than 10 presentations at national scientific meetings and more than 10 publications in peer-reviewed journals. During the 12-week internships, interns conduct research and spend 100 hours shadowing, observing and participating in field trips for educational purposes.

In 2017, Kevin Harris, MD, collaborated with USA Triathlon—the national governing body for triathlons—to conduct extensive research on triathlon fatalities. The research found that cardiovascular disease was present in more than half of the victims on whom autopsies were performed. Three of the authors on the study were undergraduate pre-medical students in the Research Internship Program.

FROM 2002-2017

183 Minneapolis Heart Institute Foundation® Research Internship Program graduates

48% are now practicing physicians

20% are medical school students

14% are in other health care professions

14% are pre-med students

4% are not in health care

Darlington “Dar” Nwaudo, Harvard University 2018, lead clinical research intern 2017 and research intern 2016 (left) with Kevin Harris, MD, Minneapolis Heart Institute Foundation® principal investigator, Minneapolis Heart Institute® director of fellowship training.
Metropolitan Heart & Vascular Institute

The Metropolitan Heart & Vascular Institute’s Clinical Research Program participates in the advancement of science and medicine through its involvement in research studies.

Metropolitan Heart & Vascular Institute partners closely with academic centers and industry leaders to answer important questions about treatment and to bring the latest in leading-edge cardiovascular therapy and prevention to its patients.

Over the last decade, its cardiovascular experts, many of them regional leaders in their field, have participated in more than 70 clinical research studies in the areas of interventional cardiology, electrophysiology, peripheral vascular and carotid disease.

Patients with severely calcified coronary arteries are often difficult to treat. Common issues include arteries that are prone to dissection, incomplete expansion of stent and difficult stent placement. Even with second-generation drug-eluting stents, the outcomes in patients with severe coronary calcification are worse than those with non-calcified arteries.

The Eclipse study compares standard treatment of severely calcified lesions with balloons and drug-eluting stents to pretreatment with orbital atherectomy, which modifies the calcified plaque prior to stent implantation.

Orbital atherectomy, produced by Cardiovascular Systems Incorporated, uses a unique mechanism of differential sanding that allows the eccentric-coated crown to both rotate in orbit, while sanding the hard materials out such as calcium, and flexing the soft material out of the way.

In the Orbit II trial, orbital atherectomy was compared to historic controls and was found to be safe and effective in treating severely calcified coronary lesions. Now in the Eclipse study, currently the largest interventional device study being conducted, orbital atherectomy will be tested against the standard of care to determine which strategy produces a better outcome for patients. Metropolitan Heart & Vascular Institute Research Program is currently one of the top 10 enrolling sites for this study.

Metropolitan Heart & Vascular Institute Research team meeting with medical director Jeffrey Chambers, MD. Team members from left to right: Stephannie Knutson, research coordinator, Jill Stahlberg, research assistant and Brittany Renier, research coordinator
United Heart & Vascular Clinic

Research highlights
- 21 active industry-sponsored trials and eight pending start-up
- four active investigator-initiated studies
- 528 research patient visits conducted
- 25 percent of UHVC physicians are Principal Investigators on at least one study
- three manuscripts accepted for publication
- four educational talks provided
- more than 300 echocardiograms analyzed for industry and investigator-initiated studies
- 2,000 patients actively managed in cardiac resynchronization therapy (CRT) database

United Heart & Vascular Clinic Cardiac Resynchronization Therapy Optimization partnership with Medtronic

The United Heart & Vascular Clinic Echo Core Laboratory (ECL) continued its partnership with Medtronic to develop a promising new investigational technology called the ECG belt.

The United Heart & Vascular Clinic Echo Core Laboratory is the lead institution—and one of only a few institutions in the world—participating in this research and development with Medtronic. United Heart & Vascular Clinic has worked closely with Medtronic since November 2014 in the early stages of this device development.

In 2017, Alan Bank, MD, and three scientists advanced this product development by using a new version of the technology in the United Heart & Vascular Clinic Cardiac Resynchronization Therapy (CRT) Optimization Clinic. Based on this experience, the team was able to provide Medtronic with key feedback to the design and utilization of the ECG belt before it was used at any other clinical institution. Additionally, the United Heart & Vascular Clinic Echo Core Laboratory received funding support from Medtronic to begin two new research studies using the ECG belt. Collectively, these studies will enroll approximately 200 subjects over the next two years. Following completion, the hope is that data from these studies will improve future patient selection for CRT recipients and programming of settings for those already receiving CRT.
Manuscript publications

The United Heart & Vascular Clinic Core Research Laboratory generated three publications in high-level peer-reviewed journals in 2017. The first publication was lead-authored by Antonia Curtin, MS, in Translational Research in Anatomy. This important study details how heart orientation within the chest varies greatly within advanced heart failure patients and cannot be readily predicted using standard clinical variables. These findings have significant clinical implications as heart orientation may alter key ECG features, often evaluated to determine patient eligibility for device therapy.

Kevin Burns, MS, authored the second publication in the European Journal of Heart Failure. The Echo Core Laboratory partnered with Medtronic and re-analyzed 706 echocardiograms collected as part of one of its large multi-center trials. This work provides a mechanistic reasoning for why one of Medtronic’s pacing algorithms results in improved patient outcomes as compared to standard pacing programming.

The third publication was accepted in December for Journal of Electrocardiology. Bank’s paper describes how standard pacemaker programming only reduces cardiac dyssynchrony by 20 percent, while an advanced ECG Belt optimization strategy could result in an additional 26 percent improvement in dyssynchrony. These results have important clinical implication as the non-responder rates to cardiac resynchronization therapy is approximately 25 to 30 percent. Therefore, optimization of pacemaker settings using the ECG belt could result in markedly improved patient response.

Abstract presentations

In May 2017, members of the Echo Core Laboratory traveled to Chicago to participate in the Heart Rhythm Society’s annual scientific sessions, the world’s leading electrophysiology meeting, to present two abstracts. Bank gave a presentation and Curtin hosted a poster board presentation. Bank also presented research at the international electrophysiology meeting EHRA Europace in Vienna.

Echocardiographic analysis for medical device companies

The United Heart & Vascular Clinic Echo Core Laboratory analyzed hundreds of echocardiographic studies for internal and external investigations. Biomedical companies will use the results of these analyses to inform decisions to seek approval from the FDA for new devices or device software.

United Heart & Vascular Echo Core Laboratory staff

- Alan Bank, MD, medical director
- Kevin Burns, PhD, research scientist
- Antonia Curtin, MS, research scientist, Biomedical Engineering University of Minnesota PhD candidate
- Ryan Gage, MS, research scientist
CARE DELIVERY RESEARCH

Emergency Medical Services

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<td>Academic presentations and abstracts</td>
<td>7</td>
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<td>Active Allina investigators</td>
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Lori Boland (second from left), principal research scientist for Allina Health EMS, and additional members of Allina Health research team from left to right: Jonathan Kamrud, program manager, EMS analytics; Andrew Stevens, MD, associate medical director; Charlie Lick, MD, medical director; and Jessica Jeruzal, research associate.
Allina Health’s Heart Safe program boosts CPR and AED use in participating communities

Allina Health Emergency Medical Services (EMS) researchers have demonstrated that individuals in Heart Safe Communities who suffer out-of-hospital cardiac arrests are four times more likely to receive chest compressions (CPR) and twice as likely to have automated external defibrillators (AEDs) placed by bystanders and first responders before EMS personnel arrive. The team published the findings in the August 2017 issue of the journal Resuscitation.

The Minnesota Heart Safe Communities program was launched by Allina Health in 2009 and encourages as well as supports the efforts of individual communities to increase public awareness about cardiac arrest and improve preparedness through activities such as promoting the use of AEDs and the timely delivery of CPR by lay citizens and first responders.

“Chest compressions and AED placement are critical first steps in the chain of survival after cardiac arrest that can be performed by citizens and first responders, so engaging the public is crucial,” said Lori Boland, principal research scientist for Allina Health EMS and lead author of the study. “As we try to fill gaps in optimal care using community-based interventions like Heart Safe, it is imperative that we study which interventions have been effective so we can share and implement them more broadly.”

Allina Health EMS medical director and coauthor on the study, Charles Lick, MD, added, “This study confirms that programs such as Minnesota Heart Safe are an effective way to provide citizen CPR education and increase availability of AEDs, enabling more community members and first responders to provide life-saving intervention in the critical first minutes after a sudden cardiac arrest.”

Boland and Lick shared their research with nearly 50 cardiac arrest survivors at the annual Allina-sponsored Minnesota Sudden Cardiac Arrest Survivor Dinner in September 2017. The event gathers and honors cardiac arrest survivors—people who were clinically dead but were resuscitated and now enjoying a meal and fellowship with family and friends—and their rescuers.
Mother Baby

Allina Health’s Mother Baby Clinical Service Line offers unique, personalized experiences for mom and baby with top-notch care throughout the childbirth journey. Collaboration plays an important role in Mother Baby research efforts.

**Congenital Cytomegalovirus (CMV) study**

Through a partnership with the Centers for Disease Control, the Minnesota Department of Health, the University of Minnesota and Allina Health, this research focuses on CMV—a common virus that affects people of all ages. Congenital CMV (cCMV) occurs when an infected mother passes CMV to the fetus through the placenta.

According to the Centers for Disease Control, approximately one in 200 babies are born with cCMV. Currently, approximately 20 percent of these babies will have long-term health issues. While some newborns may be tested as part of clinical care, cCMV is not currently assessed as part of universal newborn screening programs.

The purpose of this study is to identify the most effective method to detect cCMV to inform national and state decisions on newborn screening. As of the end of 2017, the study had enrolled 5,151 infants with approximately 26 percent enrolled from Allina Health sites.

**Water birth study**

Allina Health Mother Baby clinicians and researchers have led the development and implementation of a multisite study of water births with HealthPartners as the first site to join and contribute data in 2017.

This study represents one of the only hospital-based studies conducted on water birth in the U.S.

Two poster sessions were presented at the Minnesota chapter of the American College of Nurse Midwives in 2017. These results will also be presented nationally at the American College of Nurse Midwives in 2018.
Prenatal depression screening study

A collaborative effort between Allina Health’s Mother Baby Clinical Service Line and the Mental Health Service Line, this study addresses the challenges of depression during pregnancy and postpartum.

As the most common complication of childbirth, depression is estimated to affect from 7 to 20 percent of all mothers during pregnancy or postpartum. However, prenatal and postpartum depression are commonly undetected and undertreated. Screening and treatment guidelines were recently changed to promote universal screening of pregnant and postpartum women for better detection and treatment of this condition.

The purpose of this study is to assess current screening and treatment at Allina Health relative to the most recent guidelines, examine depression prevalence, as well as examine practices and outcomes with regard to measures of equity for the women served by Allina Health. Approximately 20 percent of all babies born in Minnesota are born at Allina Health facilities—and Allina Health is one of the largest providers of mental health services in the state, making the study a great fit. Findings from the study are being used to inform programmatic efforts at Allina Health clinics.

Active studies 8
Active enrollment 1,331
Publications 2
Academic presentations and abstracts 3
Grants awarded 1
Active Allina investigators 17
Heart of New Ulm Project research shows restaurant program can positively impact healthy food practices

Cardiovascular disease is the leading cause of death in the United States. Residents of rural areas are at an increased risk, and many risk factors are related to lifestyle behaviors such as smoking, inactivity, poor nutrition and obesity.

As part of its mission to help create a world without heart and vascular disease, the Minneapolis Heart Institute Foundation® in 2009 began Hearts Beat Back: The Heart of New Ulm Project (HONU) in partnership with Allina Health’s New Ulm Medical Center and the rural community of New Ulm, Minn. The award-winning population health demonstration project is designed to help residents reduce their risk factors for cardiovascular disease and has shown promising results.

Over the last 10 years, researchers from Allina Health and the Minneapolis Heart Institute Foundation® have published 17 articles about the project in peer-reviewed journals as they’ve examined how various interventions can impact residents’ health behaviors. Previous HONU research findings showed that after five years, residents in New Ulm demonstrated substantial improvement in their cardiovascular risk factors compared to no changes at the national level.

In late 2017, the team published its latest research, which demonstrates that a community-wide program aimed at improving the rural restaurant food environment may hold promise for increasing the availability, identification and promotion of healthier food and beverage options. The study was published in the journal Public Health Nutrition, and previously presented at the American Public Health Association.

HONU had identified that obesity and low fruit and vegetable consumption were prevalent in New Ulm, and various studies had shown that eating meals away from home may be associated with the rising prevalence of overweight and obesity.
“People often eat more calories and have poorer diet quality as a result of larger portion sizes, fewer fruits and vegetables, and increased consumption of foods higher in fat and sodium and lower in fiber,” said Rebecca Lindberg, MPH, RDN, senior director of population health, education and communications for the Minneapolis Heart Institute Foundation® and member of the research team. “We wanted to see if we could facilitate changes in the restaurant food environment in a rural community to mitigate risk factors for cardiovascular disease by making it easier for residents to make healthier choices while eating out.”

HONU began by assessing each restaurant in the community and providing them with a customized report on how they could increase the availability and promotion of healthful options. Each restaurant was also invited to participate in a HONU-coordinated restaurant program at one of three designated achievement levels—bronze, silver or gold—depending on how many healthy practices they agreed to adopt. These included practices such as offering items with more fruits and vegetables and fewer total calories, using healthier fats when cooking, offering whole grains, and also options for smaller portions.

Participating restaurants received consulting services from a registered dietitian, training for restaurant staff and local promotion of the restaurant’s participation. According to the research, across all restaurants in New Ulm over an 18-month period, the availability of non-fried vegetable offerings increased from 63 percent to 84 percent. The availability of fruit offerings increased from 41 percent to 53 percent, and the offerings of smaller portions and whole grains also increased.

While all restaurants evaluated in the community made improvements in healthy menu practices, restaurants that participated in HONU’s three-tiered restaurant program with simple-to-implement interventions were more likely to meet or adopt those healthy practices than those that did not participate in the program.

The restaurant program is just one of many interventions that HONU has delivered over the years in a variety of community settings including health care, worksites and the broader community. The project also employs a complex set of interventions including educational, organizational, health care, policy and environmental changes, as recommended in the American Heart Association’s guidelines for community-based cardiovascular disease prevention programs.
Critical Care and Hospitalist Research

Critical Care studies

PULMONARY EMBOLISM MANAGEMENT

Collaborators: Roman Melamed, MD, Abbott Northwestern Hospital intensivist; Justin Kirvin, MD, Abbott Northwestern hospitalist; Matt Lillyblad, PharmD; Bryce Mikel, MD; Mischa Adams, RN, clinical coordinator; Vincent Agboto, PhD, senior statistician; and Catherine St. Hill, DVM, PhD, principal research scientist.

Treatment effects and risk factors associated with massive and sub-massive pulmonary embolism PE outcomes are being prospectively analyzed to contribute to developing standard treatments for sub-massive pulmonary embolism. The study will evaluate the implementation of a pulmonary embolism response team (PERT) and management algorithm to reduce variability in treatment. Melamed contributes to advancement of PE care through the national PERT Consortium.

CRITICAL CARE RESEARCH PARTNERSHIPS

Chest Ultrasound: Roman Melamed, MD; Internal Medicine Bedside Ultrasound (IMBUS): David Tierney, MD; Therapeutic Hypothermia: Roman Melamed, MD; James White, MD; Joshua Huelster MD. Critically Ill Patients with Neurologic Diagnoses: Maximillian Mulder, MD; Validation of a Clinical Deterioration Prediction Tool: Lisa Kirkland, MD.

Hospitalist Research studies

POST-DISCHARGE PHONE CALL INTERVENTION

Collaborators: David Beddow, MD, Abbott Northwestern hospitalist; Justin Kirvin, MD, Abbott Northwestern hospitalist; Love Patel, MD, Abbott Northwestern hospitalist; Mengli Xiao, MS, University of Minnesota; Pamela Mink, PhD, Minnesota Department of Health; Karl Fernstrom, Minnesota Department of Health; Marc Vacquier, MS, statistician, Care Delivery Research; and Catherine St. Hill, DVM, PhD, principal research scientist.

Patients discharged by Unity Hospital hospitalists were evaluated to determine whether or not the implementation of a post-discharge phone call program improved measures of patient satisfaction, reduced the number of patients who are readmitted after being discharged, and/or increased adherence to follow-up appointments. The intervention of receiving post-discharge phone calls from discharging hospitalists increased patient satisfaction and was associated with a significant improvement in the responses to the Hospital Consumer Assessment of Healthcare Providers and Systems patient satisfaction survey for overall hospital rating and communication with doctors.

CRITICAL CARE

Active studies 8
Active enrollment 15
Publications 1
Grants awarded 1
Active Allina investigators 21

HOSPITALIST

Active studies 3
Grants awarded 1
Active Allina investigators 4

Hospitalist Research partnerships

Patterns of Social Determinants of Health and Health Outcomes: Justin Kirven, MD, used geocoding for hospital quality improvement.

Video Fistula Repair Trainer: Peter Melchert, MD, an educational program to test the efficacy of a video-based, interactive simulation training to instruct physicians in the key features of obstetric fistula repair.
The mission of Allina Health Neuroscience Research is to advocate and advance Neuroscience research across clinical programs with the ultimate goal of improving patient care.

The department’s goal is to promote, foster and sustain the highest quality research within Allina Health’s Neuroscience departments.

The Neuroscience Research department supports clinical research endeavors through initiation, coordination and analysis; offers research training to investigators and staff; assures employees, patients and visitors of a safe environment through compliance with government regulations and good safety practices; provides a program that meets or exceeds the highest national standards; educates the public about the value of the research enterprise; and promotes Allina Health’s Neuroscience Research endeavors regionally, nationally and internationally. In addition, the department focuses internal research efforts on developing and testing methods to enhance care, manage side effects of neurological conditions and improve the cost-effectiveness of treatment modalities.

Neuroscience Research Program 2017 highlights

• seven new studies were initiated including three industry-sponsored studies and four internally generated studies
• departmental Standard Operating Procedures and new staff training/evaluation procedures were reviewed and updated to provide superior organization to the research program
• a total of 58 patients were enrolled in Neuroscience research studies in 2017, including three in Neuro-Oncology trials, 19 in Neurovascular/Stroke, three in Neuro-Physiology trials and 33 in humanitarian use device studies
• 12 patients were enrolled in observational/outcomes research studies
• information from 317 patient records was abstracted for IRB-approved retrospective chart review studies with waiver of consent and HIPAA authorization in 2017
• a summer internship program for undergraduates, which attracted national applicants, was continued
• 20 peer-reviewed manuscripts were published by neuroscience researchers
• William McDonald, MD, presented leading-edge pituitary adenoma research work at the 2017 fourth annual Innovation Summit hosted by the Abbott Northwestern Hospital Foundation.
“Nurses practicing in the clinical setting are in a perfect position to participate in research and create new knowledge. We experience situations everyday as we provide care that can be transformed into research and done in our own setting. We have the resources and opportunities to further enhance our patient care by being curious, conducting nursing research and advancing nursing science.”

*Ruth Bryant PhD, MS, RN, CWOCN, director, Nursing Research*

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**NURSING RESEARCH**

Nursing Research uses clinical expertise and scientific processes and findings in an ongoing effort to achieve optimal outcomes for patients and the communities served.

**Select studies**

- Self-administered nitrous oxide for labor analgesia; Maternal and baby outcomes: To describe the maternal characteristics, and maternal and baby outcomes where continuous or intermittent nitrous oxide has been used for pain management compared to outcomes in mothers and babies where no nitrous oxide has been used.

- Validate QOLVAD: Validation of the Quality of Life with a Left Ventricular Assist Device (QOLVAD) Questionnaire; Obtaining prospective multi-site data from a comprehensive, conceptually-based study of quality of life (QoL) among a cross-section of adult patients after LVAD placement and obtain data for reliability and validity testing of the newly developed QoLVAD.

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**Active studies** 4  
**Academic presentations and abstracts** 3  
**Grants awarded** 1  
**Active Allina investigators** 7
Orthopedic surgeons at Allina Health conduct clinical studies, lecture on clinical and surgical techniques, publish original research, contribute to textbook chapters, serve as consultant reviewers for industry journals and serve as faculty to an orthopedic sports medicine fellowship program, which trains orthopedic surgeons pursuing a subspecialty in sports medicine. Orthopedic researchers also host an annual sports medicine conference and manage a unique internship program that has seen two-thirds of its interns accepted to medical school, physician assistant programs or physical therapy programs.

The orthopedic surgeons and other health care providers at Sports & Orthopaedic Specialists, part of Allina Health, are committed to research to enhance the quality of care provided to patients. By conducting research, publishing results and presenting to audiences worldwide, providers stay connected to the orthopedic and sports medicine network that produces the best information and technology available.

Sports & Orthopaedic Specialists physicians and providers lead independent clinical research projects and collaborate with other practices to advance orthopedics and sports medicine. Orthopedic surgeons are also actively involved in industry-initiated studies to evaluate different varieties of implants.

<table>
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<th>Category</th>
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<tr>
<td>Active studies</td>
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<td>Publications</td>
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<td>Media and other presentations/Allina awards</td>
<td>9</td>
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<td>Academic presentations and abstracts</td>
<td>54</td>
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<tr>
<td>Active Allina investigators</td>
<td>5</td>
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**2017 SUMMER INTERNS**
- Nicole Breuer, MS, Athletic Training, College of St. Scholastica, Duluth, Minn.
- Emily Groshens, Kinesiology, University of Minnesota, Minneapolis
- Mahmoud Hijazi, Biology, Wayne State University, Detroit, Mich.
- Eric Solis, Biomedical Engineering, University of Wisconsin, Madison, Wis.
- Matt Tran, Biology, University of Minnesota, Minneapolis

**2017-18 SPORTS MEDICINE FELLOW**
- Katie Freeman, MD
Pre-season screening clinics for overhead athletes focus on injury prevention

Overhead athletes seeking medical care often have a similar pattern of exam abnormalities, which may adversely affect performance and increase risk of injury. A decade ago, Michael Freehill, MD, L. Pearce McCarty, MD, and Aimee Klapach, MD, along with other colleagues at Sports & Orthopaedic Specialists, started a community outreach program to identify high school and collegiate athletes who may be at risk of injury during the sports season.

Local baseball players were notified of the screening sessions and invited to attend the program, which included a sport-specific examination by a sports medicine provider and instructional pre-habilitation exercises led by physical therapists including Sue Johnson, PT, and Pam Bloedel, PT, from Courage Kenny Sports & Physical Therapy.

After the first year of the program, the group realized that there was the potential to collect a vast amount of data from this cohort and the group applied for an IRB to create a database of the findings collected in the screenings. Participants can elect to complete the screening and exercise routine—and to date the screening has collected data on more than 500 high school and collegiate baseball players and more than 200 volleyball players. Trends have evolved in the database as 54 percent of baseball players and 43 percent of volleyball players have demonstrated shoulder blade dysfunction. Core/trunk weakness and shoulder tightness are also commonly identified and widely recognized. The findings have been presented at national and local conferences and data are currently being further analyzed for publication.

The program is expected to expand to other disciplines of overhead athletics including swimming and tennis. Providers at Sports & Orthopaedic Specialists and Courage Kenny Sports & Physical Therapy see great potential and benefits in this program for ongoing research in overhead athletes and most importantly, for helping to protect young athletes through injury prevention.

Current research projects

INVESTIGATOR-INITIATED STUDIES

- Overhead athlete screenings database
- Comparative analysis of porous titanium central peg versus all-polyethylene pegged glenoid design in anatomic total shoulder arthroplasty at mid-term follow-up
- Utility of immediate post-operative radiographs in total shoulder arthroplasty and reverse total shoulder arthroplasty
- Prevalence of contralateral shoulder pathology in patients undergoing rotator cuff repair at age 45 years or under
- Time-driven activity based costing in an outpatient sports medicine surgery center
- National rate and geographic variation of Superior Labrum Anterior and Posterior (SLAP) repairs
- Hormonal influence and glenohumeral laxity in female athletes
- Comparison of subscapularis management techniques in canal-sparing total shoulder arthroplasty
- Rate and geographic variation of SLAP repairs with concomitant rotator cuff repair in patients more than 50 years of age.

INDUSTRY-SPONSORED STUDIES

- Investigational device exemption of partial total shoulder replacement
- Shoulder outcomes study database (20-year follow-up study)
- Reverse total shoulder 10-year follow-up study.
REHABILITATION RESEARCH

Courage Kenny Research Center

The Courage Kenny Research Center advocates and advances rehabilitation research across clinical programs.

The Courage Kenny Research Center:
• promotes, fosters and sustains the highest-quality rehabilitation research
• supports clinical research projects and studies
• offers research training to investigators and staff
• assures a safe environment through compliance with government regulations and safety practices
• educates the public about the value of research
• promotes Courage Kenny Rehabilitation Institute regionally, nationally and internationally.
Collaboration on cancer research

Researchers at Courage Kenny Research Center have a long history of collaboration with the Virginia Piper Cancer Institute on rehabilitation to improve care and quality of life for cancer patients.

A feasibility study on the benefits of early intervention for cancer-related cognitive dysfunction associated with breast cancer led to a collaborative study called Focus Forward PreHabilitation. This research was led by co-principal investigators Mary Radomski, PhD, OTR/L, Courage Kenny Rehabilitation Institute, and Karen Swenson, PhD, RN, AOCN, Virginia Piper Cancer Institute.

Focus Forward PreHabilitation examined the implementation, acceptance and potential benefits of providing information about cancer-related cognitive dysfunction to women undergoing breast or ovarian cancer treatment.

“Participants in our program report many issues from their cancer treatments such as ‘chemo brain’ and many asked why they had to wait so long to learn about the cognitive issues they may face,” said Radomski. “In concussion literature, one of the most important ways to intervene is to provide information on how to manage cognitive issues before problems arise. We wanted to answer the question of whether this was the same for those with cancer.”

According to Radomski, patients undergoing cancer treatments often describe chemo brain as a general feeling of absentmindedness, of having difficulty expressing themselves, of struggling to find the words they want to say or not being able to multitask. “Experiencing these cognitive symptoms, even if temporary, can be very disconcerting,” said Radomski.

Radomski and colleagues at the Virginia Piper Cancer Institute recruited patients for the study shortly after their cancer diagnosis and before they started chemotherapy. Participants met with an occupational therapist at the beginning of their treatment to learn about cognition and what they might experience on their cancer journey. After completing their cancer treatments, they again met with therapists who provided the participants with simple tips and information on how to deal with cognitive challenges. The research team then followed up with participants approximately two months later.

Researchers are currently analyzing the data from this study.
Funded through the Engelsma Foundation, the Compass Course results will be examined pre- and post-participation to determine next steps.

Reclaiming life purpose after breast cancer

Out of the Focus Forward research, Radomski and colleagues are conducting a feasibility study on the benefits of providing an eight-session group intervention designed to help patients reaffirm identity and purpose in life after completing treatments for breast cancer. “The sense of needing a reset for many people is common on the other side of a cancer diagnosis and treatment,” said Radomski.

Funded through the Engelsma Foundation, the Compass Course results will be examined pre- and post-participation to determine next steps.

“This research would not be possible without our partnership with the Virginia Piper Cancer Institute,” said Radomski. “They have been incredible advocates for these studies on survivorship and rehabilitation. It’s a wonderful partnership for our patients.”

Examples of collaboration

• NRN-ABLE program
• Virginia Piper Cancer Institute Purpose Project Feasibility study, Purpose Project Efficacy study, Focus Forward PreHab study
• EKSO Bionics-WISE Trial
• Laurie King, collaborator, Exploring the Role of Combined Cognitive and Motor Dual-task Assessment and Rehabilitation for Individuals with Residual Symptoms after mTBI.
Understanding the complexity of the spine is key to successfully treating complex spine conditions. Amir Mehbod, MD, Twin Cities Spine Center, explains the structure of the spine.

SPINE RESEARCH

Twin Cities Spine Center

Spine research is conducted by Twin Cities Spine Center surgeons and includes retrospective and prospective clinical studies, and quality improvement projects. Manuscripts are currently being prepared for several studies that have been completed.

Clinical and functional data are the foundation of the medical research conducted. These data are captured by a number of research instruments, some of which are completed by the patient and some of which are completed by the clinician.

Other data may include:

- imaging studies such as X-rays, CT scans and magnetic resonance (MR) images
- intraoperative statistics such as blood loss and duration of surgery
- postoperative information including complications
- health economics results such as surgical costs and length of hospital stay.
Allina Health Spine Consensus Conference

Allina Health hosted its second Spine Consensus Conference on Nov. 10, 2017, with the assistance of Twin Cities Spine Center surgeons and staff. This conference was convened with the purpose of educating providers from many specialties on how to integrate and measure improvement, using a multidisciplinary approach to spine care. Internationally recognized speakers shared national and global perspectives on spine care challenges, and interactive breakout sessions included panel discussions.

Active Clinical Research Studies

- Allograft bone versus PEEK for one- and two-level anterior cervical decompression and fusion (ACDF): A retrospective review of clinical outcomes. Amir Mehbod, MD, principal investigator; Fettah Buyuk, MD, John Dawson, PhD, co-investigators.

- Cervical spine surgery: Do the benefits outweigh the risks? Joseph Perra, MD, principal investigator; Amir Mehbod, MD; Timothy Garvey, MD; Kurt Duncan, MD; Alexander Lemons, MD; Michael Planalp, MD, co-investigators.

- Evaluating the long term outcomes and need for further surgery following L4-L5 floating fusions: A surgical outcomes and natural history study. Ensor Transfeldt, MD, principal investigator; Jonathon Geisinger, MD, co-investigator.

- L4-L5 fusion with and without adjacent level decompression for patients with degenerative spinal conditions: Does decompression increase the risk of or prevent adjacent segment degeneration in 5-years? Manuel Pinto, MD, principal investigator; Christian Gaffney, MD, co-investigator.

- Two-year minimum follow-up for postoperative wound infections following spine surgery: The incidence of re-infection. Joseph Perra, MD, principal investigator; Viral Patel, MD, co-investigator.
Flu fighters: Collaborative research of Infectious Diseases and Minneapolis Heart Institute® examines the flu vaccine dosage in heart disease patients

Influenza can lead to serious complications including hospitalizations or death. Some people, including the elderly, young children and those with certain health conditions, are at a higher risk of serious flu complications.

In fact, influenza-related death is more common in people with heart disease than any other chronic health condition. People with heart disease who get the flu are more likely to have heart attacks, and those with heart failure and the flu are more likely to be hospitalized. According to the Centers for Disease Control, the annual flu shot has been shown to reduce the risk of major cardiac-related events.

Is there a better way to deliver a flu shot to those with heart disease? A five-year, 9,000-person study funded by the National Institutes of Health National Heart, Lung and Blood Institute is underway to answer that question.

The INVESTED trial (INfluenza Vaccine to Effectively Stop cardio Thoracic Events and Decompensated Heart Failure) is designed to determine which of two formulations of influenza vaccine—the standard dose or an investigational higher dose—is more effective in reducing deaths and heart- or lung-related admissions to the hospital.

“We have the ability to touch so many more people when we work with other areas of Allina Health doing research,” said Bouley. “The ultimate goal is improving patient care and the health of our communities by keeping people healthy and out of the hospital.”
Infectious Diseases research collaborations

- budget training for Allina Health and affiliated research teams
- Infectious Diseases Research team offered human subject training for nurses and physicians at the Allina Health Coon Rapids Clinic
- collaborated with Minneapolis Heart Institute® on the INVESTED clinical trial
- collaborative nasal swab sample study with Abbott Northwestern General Medicine Associates residents on the Abbott Northwestern campus
- collaborated on a yellow fever vaccine protocol launch and oversight with Allina Health Coon Rapids Clinic.

Rita Bouley, RN, Infectious Diseases senior research nurse clinician, serves as the INVESTED trial study coordinator for Allina Health. “We collaborated with the Minneapolis Heart Institute®, specifically Dr. Peter Eckman and Dr. Jay Traverse, on this trial,” said Bouley. “Each day, more than 120 patients are typically seen in the Minneapolis Heart Institute clinic, and we asked patients with congestive heart failure or history of myocardial infarction, if they were interested in participating in the INVESTED trial.”

In a two-month period in the fall of 2017, Bouley screened 146 people and enrolled 57 in the trial. For the eight-week enrollment period, the Allina Health recruitment numbers were in the top 10 of all 180 sites in the United States and Canada participating in the INVESTED trial. “This shows how much more we can do when we lock hands with our partners,” said Bouley.

Cardiologists at the Minneapolis Heart Institute® invited Bouley and Frank Rhame, MD, principal investigator for the INVESTED trial and infectious diseases physician, to a meeting to help educate Minneapolis Heart Institute® nurses and physicians on the purpose and goals of the study.

“We have the ability to touch so many more people when we work with other areas of Allina Health doing research,” said Bouley. “The ultimate goal is improving patient care and the health of our communities by keeping people healthy and out of the hospital.”

The INVESTED trial is one example of Allina Health’s focus on keeping patients healthy while educating and informing the community through research protocols. “We are offering people options before they are available to the general public,” said Bouley. “Patients get the opportunity to have the latest treatment options possible through research.”
RESEARCH INFRASTRUCTURE AND SUPPORT

Clinical Research Informatics and Analytics (CRIA)

In 2017, the CRIA team fulfilled 83 requests for data. Other services include:

- serving as a liaison to other Allina Health departments, such as Information Services and Health Information Management
- providing electronic health record (EHR) research access approval and management
- offering EHR research functionality implementation, management and support
- providing innovation, implementation, management and support of hardware and software specific for research use
- conducting educational programs related to data use and analytics for research
- completing PCORNet clinical data research Learning Health System Network (LHSNet) implementation, management and support.

STUDY SUPPORT SERVICES

- grant preparation support for cohort identification, feasibility and budgeting
- IRB application support for cohort identification
- electronic health record data identification and variable list feasibility
- workflow analysis
- Epic research functionality build and project management
- eligible patient identification
- data extraction
- ad hoc analytics support.

Human Research Protection Program

The Human Research Protection Program is responsible for ensuring the ethical and equitable treatment of all human subjects in research conducted under the auspices of Allina Health.

The mission of the Human Research Protection Program is to:

- safeguard and promote the health and welfare of human research subjects by ensuring that their rights, safety and well-being are protected
- provide guidance and support to the research community in the conduct of research with human subjects
- assist the research community in ensuring compliance with relevant regulations
- provide timely and high quality review and oversight of human research projects, and
- facilitate excellence.
Research Compliance

The Research Compliance Program is a collaboration among many stakeholders including researchers, Compliance/Privacy, Research Operations, Legal, Human Research Protection Program and others to ensure proper systems exist to support Allina Health Research from a compliance perspective.

The Research Compliance Program includes:

- research conflict of interest including support for the Research Conflict of Interest Committee
- research privacy, human subject research in collaboration with the Human Research Protection Program
- research billing and biosafety.

Collaboration examples

- Research Conflict of Interest Committee worked with the Allina Health Patient & Family Advisory Council (PFAC) to gather patient input on research conflicts of interest. Feedback from patients guided how the committee reviewed and managed research conflicts of interest.
- To create more efficiencies in research contracting, Research Operations and Legal worked together to fine-tune institutional positions related to clinical trial agreements.

We show INTEGRITY and RESPECT by approving ethical research and ensuring it is conducted the right way.

We create TRUST and show COMPASSION to our subjects by making sure our research teams are properly trained to conduct research and protection of subjects is our first priority.

We support STEWARDSHIP by striving for excellence in human research protections.

Research Operations

In 2017, the Research Operations team continued its work on projects to streamline internal workflows, update policies and procedures, and enhance the department’s infrastructure. Several new team members joined the organization and contributed significantly to providing robust operational and administrative support for Allina Health researchers. The following key metrics demonstrate the significant volume of work completed by the team in 2017:

- The Research Contracts team reviewed and negotiated 249 agreements in 2017—a 68 percent increase in agreements received over 2016. This work includes ensuring each agreement considers Allina Health’s best interests and operational best practices, conforms to Allina Health policies, and is in compliance with applicable laws.
- The Grants and Finance team managed 25 active federal grants totaling approximately $2 million. This is consistent with Allina Health’s 2016 federal grant activity. Grant management includes assisting Allina Health researchers with pre-award applications, budget development, post-award financial administration, and meeting all compliance and reporting requirements.
Accountable Health Communities Model

We use a **19-item questionnaire + new workflow** that looks at five health-related social needs of Medicare & Medicaid beneficiaries.

Connects patients to resources in their communities to meet their unique identified needs.

Allina Health Research Operations and Sponsored Programs Office provided support to Allina’s Accountable Health Communities model.

The model will test whether systematically identifying and addressing the health-related social needs of Medicare and Medicaid patients impacts health care quality, use and cost. The goal is to develop and implement a coordinated, collaborative, system-wide approach to better support and care for all the needs of these patients.

The Accountable Health Communities model will screen at least 75,000 patients annually beginning in 2018 in the following locations:

- Allina Health primary care clinics
- urgent cares
- outpatient mental health clinics
- Mercy Hospital including the Unity Campus
- Regina Hospital
- Cambridge Medical Center
- Minnesota Perinatal Physicians clinics
- select OB/GYN clinics.

If a patient identifies needs, he or she will be provided with a list of community resources that may help address those needs. A subset of these patients will be offered additional support through navigation services in accessing these resources from a member of the Allina Health care team.

The contents provided are solely the responsibility of the authors and do not necessarily represent the official views of HHS or any of its agencies. The project described was supported by Funding Opportunity Number CMS-1P1-17-001 from the U.S. Department of Health & Human Services, Centers for Medicare & Medicaid Services.
The National Patient-Centered Clinical Research Network

Pragmatic research to improve patient health

The National Patient-Centered Clinical Research Network (PCORnet) is an innovative clinical research network designed to enable large-scale clinical research with enhanced quality, collaboration and efficiency.

LHSNet is one of 113 local networks of PCORnet, and Allina Health is one of eight leading health care institutions participating in the LHSNet network. Through LHSNet, entities across the U.S. bring together a diverse patient population of more than 10 million individuals.

“LHSNet is the future of how pragmatic, randomized trials will be conducted,” said Steven Bradley, MD, MPH, Allina Health site principal investigator for LHSNet. “Through the network, we are able to leverage the health care delivery system to understand the impacts and outcomes of treatments for patients.”

The LHSNet research datamart is supported by the Clinical Research and Informatics Information Team (CRIA).

LHSNet studies currently underway at Allina Health and the Minneapolis Heart Institute Foundation® include:

• The ADAPTABLE (Aspirin dosing: a patient-centric trial assessing benefits and long-term effectiveness) study to compare the effectiveness and safety of two doses of aspirin in high-risk patients with coronary artery disease.

• The INVESTED trial. See page 34 of this report for more information.

“As a large health care system with a robust data infrastructure, Allina Health is well-positioned to participate in the network and contribute to this important research to improve patient care,” said Bradley.

Types of data

Steven Bradley, MD, MPH, cardiologist, Minneapolis Heart Institute®; associate director, Minneapolis Heart Institute Center for Healthcare Delivery Innovation; site principal investigator, LHSNet
LHSNet goals

Build the infrastructure to:

• facilitate patient-centered outcomes research
• support large pragmatic clinical trials, and observational and interventional comparative effectiveness research studies embedded within the health care system
• enable the dissemination, implementation, and evaluation of clinical and community efforts to improve population health.

Key strengths and impact indicators

• 10 million patients
• six states geographic coverage
• goal of three million linked lives in three years
• active patient engagement
• established collaborative relationships
• ethnic and socioeconomic diversity
• established clinical trial and informatics experience
• community partnerships and public health engagement.

“LHSNet is the future of how pragmatic, randomized trials will be conducted,” said Steven Bradley, MD, MPH, Allina Health site principal investigator for LHSNet. “Through the network, we are able to leverage the health care delivery system to understand the impacts and outcomes of treatments for patients.”
The Importance of Philanthropy to Allina Health Research

“Sharing clinical knowledge is fundamental to Abbott Northwestern’s role as a regional health care resource,” said Richard Meyer, president, Abbott Northwestern Hospital Foundation.

Abbott Northwestern Hospital Foundation

In 2017, the Abbott Northwestern Hospital Foundation provided support for research in the amount of $1,926,010.

SHARING ABBOTT NOTHWESTERN’S RESEARCH AND TREATMENT ADVANCES

On Nov. 4, 2017, the Abbott Northwestern Hospital Foundation hosted an Innovation Summit at the Hyatt Regency Minneapolis. The event was an opportunity for attendees to learn about innovative advances in patient care offered at Abbott Northwestern Hospital.

Moderated by Dennis O’Hare, MD, vice president of Medical Affairs at Abbott Northwestern, speakers presented Allina Health updates, and physicians provided specialty-specific updates including Cardiovascular, Neuroscience, Mental Health, Orthopedic and Women’s Health. “Sharing clinical knowledge is fundamental to Abbott Northwestern’s role as a regional health care resource,” said Richard Meyer, president, Abbott Northwestern Hospital Foundation.

Courage Kenny Foundation

In 2017, Courage Kenny Foundation supported research at Courage Kenny Rehabilitation Institute in the amount of $895,822 for research grants and operating support.

United Hospital Foundation

In 2017, the United Hospital Foundation provided research support in the amount of $169,296 for research including:

- United Heart and Vascular Cardiac Resynchronization Therapy Center of Excellence development
- Cardiac Resynchronization Therapy Optimization Clinic research study using EKG vest
- United Family Medicine Genetic Assessment
- Conivapatan for the reduction of cerebral edema in intracerebral hemorrhage
- Otolaryngology research assistant
- Development of new flow cytometric
- CESQIP: Collaborative endocrine surgery quality improvement
- Clinical research support for Vascular & Skull Base Neurosurgery.


CARDIOVASCULAR METROPOLITAN HEART AND VASCULAR INSTITUTE


CARDIOVASCULAR
UNITED HEART & VASCULAR CLINIC


CARE DELIVERY RESEARCH
CRITICAL CARE


CARE DELIVERY RESEARCH
CV AND HONU


CARE DELIVERY RESEARCH
EMERGENCY SERVICES


CARE DELIVERY RESEARCH
MOTHER BABY


CARE DELIVERY RESEARCH
INFECTIOUS DISEASES


224. Thomas MC, Delgado Almandoz JE, Todd AJ, Young ML, Fease JL, Scholz JM, Milner


ORTHOPEDIC RESEARCH

SPORTS & ORTHOPAEDIC SPECIALISTS


238. Buss DD, Stern SH, McCarty LP III. Tervola NK, Giveans MR. Prevalence of Rotator Cuff Repairs With and Without Concomitant Subacromial Decompressions. HSS.


REHABILITATION

COURAGE KENNY REHABILITATION INSTITUTE


SPINE

TWIN CITIES SPINE


ABSTRACTS & PRESENTATIONS

CANCER
VIRGINA PIPER CANCER INSTITUTE


9. Poster presentation: Kirk CM, Muhsin M, Bosshardt L. Management of musculoskeletal events (MSE) in a Phase 2 study of metastatic pancreatic cancer patients receiving a novel treatment approach of PEGPH20 (pegylated hyaluronic acid) plus nab-paclitaxel/gemcitabine (PAG) - a nursing perspective. Accepted for poster presentation at ONS Congress, May 2018, Washington, DC.


12. WCCO Radio Interview: Michaela Tsai was interviewed on WCCO Radio for a talk entitled “Cancer Death Drop Rate” on Jan 13, 2017. Link: https://vimeo.com/user14179445/review/199894758/a36f93c3d7

13. KARE11 TV Interview: Michaela Tsai was interviewed on KARE11 for a segment on the drop in cancer death rates on February 2, 2017. Link: https://vimeo.com/user14179445/review/202113394/c52ae8116b

14. ACS Cancer Action Network/Allina Health Minnesota Research and Innovation Breakfast: Michaela Tsai, Tom Amatruda, Arek Dudek, Joseph Leach, and a VPCI research participant presented Immunotherapy: A new frontier in treating cancer, November 7, 2017, Pettingill Hall, Minneapolis, MN

CARDIOVASCULAR
MINNEAPOLIS HEART INSTITUTE FOUNDATION


58. Miedema M. My 52-Year-Old Patient with Hypertension and Smoking with a coronary Calcium Score of 0. Should I Discuss Statin Use with this Patient? Presented March 17, 2017 at ACC Conference, Washington DC.


87. Miedema at AHA – CAC consortium study

88. Miedema at AHA – statin eligibility guidelines

89. Brilakis at TCT – CrossBoss First

90. Soraja at TCT – Intrepid

91. Harris – Triathlon study

92. Soraja – Triluminate study – 1st ever treatment for tricuspid valve disease

93. Soraja - 250th MitraClip procedure

94. Miedema – JAH article, gained media attention (local Kare11 story and quoted in US News) for the statin eligibility and STEMI research

95. Wang – Radiance study – sibling group on KSTP

96. Soraja at ACC – MitraClip outcomes

97. Marcus Burns at ACC – conscious sedation

98. Johnson at ACC – Cardiogenic shock outcomes in STEMI

99. Grey on WCCO – SCAD

100. Burke on WCCO radio – sugar vs. fat research

101. Traverse – Concert study

102. Katsiyannis - WCCO Radio - MHIF gala promotion

CARDIOVASCULAR METROPOLITAN HEART AND VASCULAR INSTITUTE


111. Chambers JW. Approaches to Coronary Physiology: FFR, Contrast FFR, Pd/Pa and iFR - When to Use What Presentation at Complex Cardiovascular Catheter Therapeutics (C3); June 27, 2017; Orlando, FL.

112. Chambers JW. Management of Heavy Thrombus Burden and Slow Flow, No Re-flow in Cath Lab (with 5-minute Discussion). Presentation at Complex Cardiovascular Catheter Therapeutics (C3); June 27, 2017; Orlando, FL.

113. Chambers JW. Dealing with Calcium. Presentation at Advanced Revascularization Chapter IX (ARCH); February 22, 2017; St. Louis, MO.

114. Chambers JW. Considerations for Facilitation BVS Placement in Severe Calcium. Presentation at Cardiovascular Research Technologies (CRT); February 20, 2017; Washington, DC.

115. Chambers JW. Methods for Hyperemic Assessment of FFR. Presentation at Cardiovascular Research Technologies (CRT); February 18, 2017; Washington, DC.

116. Chambers JW. The Effect of FFR Wire Design on Function. Presentation at Cardiovascular Research Technologies (CRT); February 18, 2017; Washington, DC.
ABSTRACTS AND PRESENTATIONS

CARDIOVASCULAR
UNITED HEART & VASCULAR CLINIC


CARE DELIVERY RESEARCH
EMERGENCY SERVICES


128. Kamrud JW, Boland LL, Stevens AC, Jeruzal J, Lick CJ. Adherence to recommendations for prehospital cardiac arrest care across an EMS system of care: how well are we implementing guidelines? Abstract accepted to: National Association of EMS Physicians (NAEMSP); 2018 Jan; San Diego, California.


CARE DELIVERY RESEARCH
HONU


CARE DELIVERY RESEARCH
MOTHER BABY


139. Dreon M, Sidebottom A, Schleiss M. Congenital CMV infection: Universal newborn screening and early intervention model. Fetal to Neonatal Care: Advances in Therapies for Mother and Baby; 2017 Oct 6; Minneapolis, Minnesota

CARE DELIVERY RESEARCH
INFECTIONOUS DISEASES


141. Rhame F on KMSG TV, January 23. Respiratory Illness

142. Rhame F on KARE TV, February 1. Norovirus

143. Rhame F. Abiton, February 1, Zika

144. Rhame F on KARE TV, February 2. Influenza

145. Rhame F on WCCO Radio, February 20. Adult Immunization

146. Rhame F. UM ID February 21. Syphilis

147. Rhame F. UM ID March 14. Resistance
148. Rhame F. UM March 21, Cases
149. Rhame F. MATEC April 26, CROI
150. Rhame F. White Earth Tribe May 3, HCV Controversies
151. Rhame F. on KARE TV, May 4, Lyme
152. Rhame F. on KARE TV, August 2, Dirty Money
153. Rhame F. on KARE TV, September 13, Influenza Vaccine in Pregnancy
154. Rhame F. on WCCO Radio, November. 7, MDR TB Outbreak in St. Paul
155. Rhame F. on KARE TV, December 5, Shingrix
156. Rhame F. on KARE TV, December 21, Man Flu

NEUROSCIENCE
JOHN NASSEFF
NEUROSCIENCE INSTITUTE


171. Delgado Almandoz JE, Kayan Y. ADAPT Mechanical Tendinectomy. Presented as an electronic scientific poster at the 9th Congress of the European Society of Minimally Invasive Neurological Therapy; 2017 Sept 7; Nice, France.

173. Delgado Almandoz JE, Kayan Y. ADAPT Cervical Mechanical Thrombectomy with NeuronMax. Presented as an electronic scientific poster at the 9th Congress of the European Society of Minimally Invasive Neurological Therapy; 2017 Sept 7; Nice, France.


177. Lintelmann A, Onyeghala G, Lutsey P, Folsom A, Prizment A. Adherence to the WCRF/AICR cancer prevention guidelines and colorectal cancer incidence in the Atherosclerosis Risk in Communities (ARIC) study. Presented at the UMN School of Public Health Research Day; 2017 Apr 5; Minneapolis, MN.

178. McDonald WC, Banerji N, McDonald KN, Ho B. Pituitary Adenoma Immunohistochemical Characterization: Refining an Algorithm. Poster presented at: Annual Meeting of the United States & Canadian Academy of Pathology; 2017 Mar 4-10; San Antonio, TX.


190. Skinner SA. (1) Basic IOM principles: modalities: utility and limitations of SSEP, EMG; D-wave, neurogenic potentials, EMG trigger-free run. (2) Alarm criteria in IOM. (3) IOM in tethered spinal cord surgery (4) Evidence in IONM. Presented at Colegio Mexicano de Medicina de Electrodiagnostico COMEFYR in Cancun, MX, February 2017.


ABSTRACTS AND PRESENTATIONS


198. Dr. Corry appeared on Kare 11 News in February, 2017 discussing “The Mediterranean Diet and Brain Shrinkage”

199. Dr. Corry appeared on Kare 11 News in July, 2017 discussing “The Truth about Brain Games”

200. Dr. Corry led the podcast series Neurology 101 on the Allina Health WELLcast discussing the intersection of neurology and daily life

ORTHOPEDICS
SPORT & ORTHOPAEDIC SPECIALISTS


ABSTRACTS AND PRESENTATIONS


231. Freehill MQ. Merits of Augmented Reverse Total Shoulder. Presented at Wright/Tornier Meeting. 2017 July 18. Bloomington, MN. USA


REHABILITATION

COURAGE KENNY

REHABILITATION INSTITUTE


260. Wellner, C. Effectiveness of a community based fall prevention class in changing fall risk behaviors. Accepted for PT Combined Sections Meeting.

261. Weightman MM; Department of Defense Return to Duty Subject Matter Expert Meeting (via TCON to Fort Detrick, MD) on recommendations for assessments for mild Traumatic Brain Injury. February 2017.


ABSTRACTS AND PRESENTATIONS

SPINE

TWIN CITIES SPINE CENTER


Coming together is a beginning; keeping together is progress; working together is success.

Henry Ford