Center for Women's Health Research
UNIVERSITY OF COLORADO ANSCHUTZ MEDICAL CAMPUS

Center For Women's Health Research

Quarterly Highlights

FALL 2019 QUARTERLY HIGHLIGHTS

"The Center for Women's Health Research is extremely grateful to all of our benefactors..."

Hello! *From Dr. Judy Regensteiner, CWHR Director and Co-founder*

As we enter the holiday season with the majority of our annual events now behind us, I would like to extend my most sincere appreciation to the supporters of the Center for Women's Health Research. Here's to celebrating another great year of progress in working to move forward women's health and the health of the family!

Nine talented researchers became CWHR scientists this year and will benefit from the mentoring, training, and funding model that is central to our mission. In total, we have over 70 researchers affiliated with the CWHR, and their phenomenal work is advancing women's health and the health of the family each day. (Read more on page 4)

The Annual Community Luncheon continues to exceed our expectations! This year we featured Pulitzer Prize-winning author Siddhartha Mukherjee, MD, who spoke about his career as a physician and oncologist, and discussed three themes relating to the human genome. The Center for Women's Health Research is extremely grateful to all of our benefactors whose generous support benefits our operations and programs, and we would like to offer a special thanks to all of our supporters. (Read more on page 8)

In early October, the CWHR proudly hosted the 7th Annual Women's Health Summit of LEADERS (Leaders Empowering the Advancement of Diversity in Education Research and Science). We had the privilege of bringing together 40 MDs and PhDs and 10 Development Officers – the largest group convened to date. Begun in 2013, this group of leaders in academia is committed to advancements in women's health through the establishment of endowed chairs thus elevating women's health and sex differences at academic institutions. (Read more on page 2)

We welcome you to join us for our last event of the year, Let's Talk: Inside and Out: Understanding Important Parts of the Body and What they Mean for your Health, which will be taking place on December 12th, and we look forward to bringing you more exciting events and news in 2020. Learn more about Let's Talk and other news by visiting our website www.cwhr.org – it is new too!

Judy Regensteiner

Judy Regensteiner, PhD

INSIDE THIS ISSUE

CWHR hosts 7th Annual LEADERS in Women's Health Summit

The 7th annual summit of the LEADERS (Leaders Empowering the Advancement of Diversity in Education, Research and Science) in women's health was hosted by the Center for Women's Health Research and held at the Anschutz Medical Campus on October 4th. Begun in 2013, this group of female leaders in academia is committed to advancements in women's health through the establishment of endowed chairs. Increasing the number of endowed chairs in women's health is a key driver in ensuring that women's health is regarded as a strategic priority at academic medical institutions across the U.S. and Canada. As a member of the LEADERS steering committee, CWHR director Judy Regensteiner, PhD led this year's effort to bring together 40 MDs and PhDs and 10 development officers, the largest meeting to date. Jeanine Clayton, MD, Director of the National Institutes of Health (NIH) Office of Research on Women's Health (OWRH), also joined the meeting by videoconference and shared strategic details about the ORWH's mission of advancing women in biomedical careers, ensuring that women are appropriately represented in research, and strengthening and enhancing research related to diseases, disorders, and conditions that affect women.

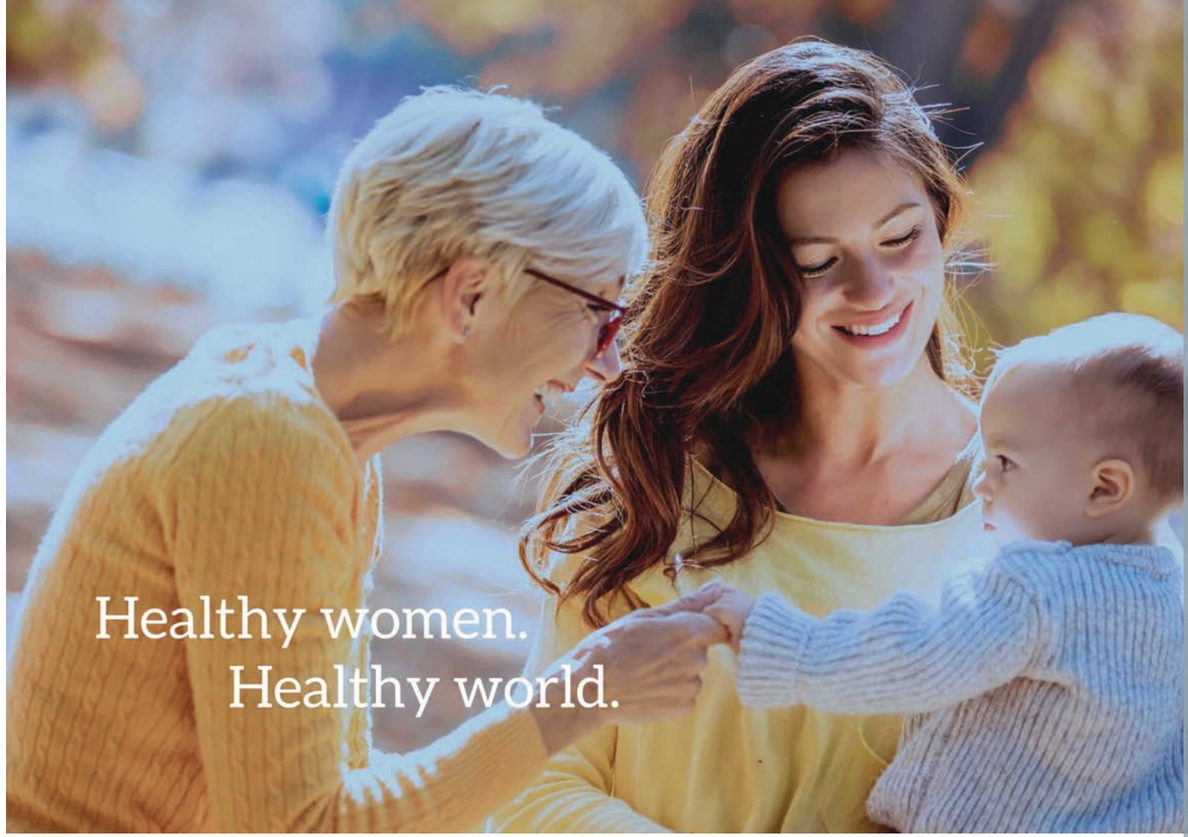
2nd LEADERS in Women's Health Summit in 2014

7th Annual LEADERS in Women's Health Summit in 2019

The CWHR was able to host this prestigious meeting thanks to the leadership and support of CWHR Emeriti Chair Mary Sissel, Advisory Board Member Patti Klinge, The Anschutz Foundation, CU Anschutz Chancellor Don Elliman, and CU School of Medicine Dean John Reilly, MD.

Upcoming Events

December 11	**Researcher training led by Anne Libby, PhD, "Strategizing your Scholarship: Showing Reach, Quality, and Impact"**
December 12	**Let's Talk: Conversations about Women's Health, "Inside and Out: Understanding Important Parts of the Body and What they Mean for your Health"**
February 29	**2020 Women's Health Symposium**



It's Here! Announcing the Launch of Our New Website

We are pleased to announce our newly redesigned website, www.cwhr.org. With a clean, engaging look distinctive to our Center and aligned with the University of Colorado Anschutz Medical Campus, the site offers easy navigation and a design responsive to all devices. It shines a bright light on the critical research underway at the Center for Women's Health Research and the pioneering efforts of our researchers to shape better health care for all. We encourage you to visit and explore the site.

Learn about our research of diseases that pose great risks to women – cardiovascular disease, diabetes and the intersection of mental and physical health. Meet our renowned faculty leaders who mentor the burgeoning cadre of researchers, along with the funding and supports we provide to further the careers of scientist who study women's health and sex and gender differences.

You will also discover news and stories of groundbreaking research, health tips, and the latest news from our Center, along with ways to get involved through our many events or by participating in a study being conducted by our researchers. Learn too about the wide variety of ways you can give, our generous donors, and how your giving fuels critical research across the lifespan, making healthier, more hopeful futures possible.

We appreciate the many insights and efforts provided by members of our Medicine Cabinet, advisory board and staff that made this redesign possible! We invite you to share with us your feedback on the new website, along with ideas for continuing improvements and enhancements. Please also stay connected – and encourage others to connect with us – and join the conversation through our Newsletter and on Twitter, LinkedIn, Facebook, and YouTube.

Congratulations! 2019 Faculty Award Recipients

In 2019, the Center for Women's Health Research awarded 10 new seed grants. Special thanks to the following funders of these awards: Cathy and Graham Hollis, the List Family Foundation, the Ludeman Family, Rose Community Foundation, Specialized Center of Research Excellence (SCORE) on Sex Differences, University of Colorado School of Medicine, and other generous donors.

FABRICE DABERTRAND, PhD, *Departments of Anesthesiology and Pharmacology* **Sex Differences in Hippocampal Vascular Dysfunction after Cardiopulmonary Resuscitation from Cardiac Arrest**

From subtle behavioral alterations to late-stage dementia, vascular cognitive impairment typically develops following any condition that reduces blood flow to the brain, such as in stroke and cardiac arrest. Dr. Dabertrand will study sex differences in the impairment of small blood vessels in the brain caused by cardiac arrest followed by cardiopulmonary resuscitation. Dr. Dabertrand's goal is to establish a laboratory dedicated to the interface between cardiovascular research and neurosciences.

ELISSA KOLVA, PhD, *Division of Medical Oncology, Department of Medicine*
Fertility Changes due to Cancer: An Investigation of Meaning, Psychological Distress, and Psychological Support Needs of Young Women with Breast Cancer

Young women with breast cancer often experience reproductive concerns or threats to plans for fertility, pregnancy, and parenting which can negatively impact quality of life and result in symptoms of psychological distress. Women are less likely than men to receive fertility-related information, and there is limited research on psychological support interventions for this population. A loss of meaning and purpose in life due to reproductive concerns can negatively impact quality of life in women with cancer. The purpose of Dr. Kolva's study is to explore the relationship between reproductive concerns, psychological distress, and sense of purpose in young women with breast cancer and identify preferences for psychological intervention, including meaning-centered therapy.

GENEVIEVE MOYER, MD, MSc, *Division of Hematology, Department of Medicine*
A Laboratory and Clinical Assessment of the Impact of Menopause and Aging on Post-menopausal Bleeding and Atherosclerotic Cardiovascular Disease Risk in Women with Inherited Bleeding Disorders

Over the last two decades, an increased appreciation of the impact of abnormal uterine bleeding on women with mild bleeding disorders has led to an increasing number of female patients seeking care. However, knowledge of how to best care for these patients has stalled. As the population ages, more women with inherited bleeding disorders will be confronted by age-related conditions, such as the increased risk for blood clots, which contribute to an increased risk for heart disease and stroke. The degree to which an inherited bleeding disorder decreases the risk for age-related cardiovascular diseases is currently unknown. The information generated from Dr. Moyer's study will help clinicians make informed decisions that balance the inherent bleeding risk in women with bleeding disorders with the risk of heart attack and stroke.

ANDREW NOVICK, MD, PhD, *Department of Psychiatry*
My Transgender Brain Study (MyT "Mighty" Brain)

High-dose testosterone treatment in transgender individuals represents an important intervention to affirm gender and allow for transition. However, little is known regarding how this treatment affects brain health and cognition related to optimal productivity and function in everyday life. The present study will measure cognitive performance and brain activity in both female-to-male transgender individuals who are undergoing testosterone treatment and those who are not. In understanding how hormone treatments for transgender individuals affect the brain, Dr. Novick aims to promote treatment in the safest, most informed manner possible.

VIJAY RAMAKRISHNAN, MD, *Department of Otolaryngology*
Gender-Specific Effects of Chronic Rhinosinusitis on Sleep and Psychological Dysfunction

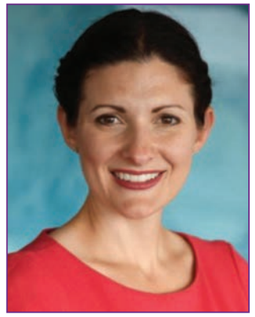
Chronic rhinosinusitis (CRS) is a highly prevalent and extremely burdensome disease that more commonly affects women. It inflicts a severe quality-of-life impairment, including symptoms such as headache, sleep dysfunction, cognitive dysfunction, and depression. How sinus inflammation causes these effects is not entirely clear. However, it is increasingly apparent that these non-sinus related symptoms are often what drive patients with CRS to seek medical care. Dr. Ramakrishnan hypothesizes that women with CRS suffer from a higher symptom burden than men. The goal of his research is to advance our understanding of how sex influences the presentation, patient-specific needs, and therapeutic goals in CRS. Ultimately, such knowledge has the potential to impact how medical and surgical therapy are used in CRS

KALIE TOMMERDAHL, MD, *Section of Endocrinology, Department of Pediatrics*
Sex-related Differences in the Metabolic and Renal Effects of Automated Insulin Delivery Systems in Youth with Type 1 Diabetes Mellitus

In type 1 diabetes, the pancreas produces little or no insulin. Novel diabetes technologies have been developed that use a blood sugar sensor to judge when to either pause the amount of insulin that is delivered or increase the amount delivered to help keep blood sugars in the target range. Type 1 diabetes is an independent risk factor for the development of decreased sensitivity to insulin in adolescents, and women with type 1 diabetes have a decreased sensitivity to insulin when compared to men with type 1 diabetes. A decreased sensitivity to insulin is known to increase the risk for developing both heart and kidney disease. Dr. Tommerdahl hypothesizes that the pauses in insulin delivery that are unique to new diabetes technologies could increase sensitivity to insulin, particularly in women, thereby decreasing the likelihood of heart and kidney disease and improving the health of women with type 1 diabetes.

Recipients of the Interdisciplinary Cardiovascular Research Award in Women's Health & Sex Differences

ROSE COMMUNITY FOUNDATION



DANIELLE E. SORANNO, MD, *Pediatric Nephrology/ The Kidney Center, Departments of Pediatrics, Bioengineering & Medicine*

PETER BAKER, MD, *Clinical Genetics & Metabolism, Department of Pediatrics*

Determining the Cardio-protective Effects of Estrogen after Acute Kidney Injury in Mice

Acute kidney injury (AKI) is where your kidneys suddenly stop working properly. It is a common complication in hospitalized patients and leads to increased hospital length of stay, increased hospital costs, and worse patient outcomes. AKI also significantly impacts other organ systems, including causing cardiac complications similar to that of a heart attack. In females, estrogen protects against the kidney complications of AKI, but it is currently unknown whether it also protects against the systemic effects that result in patient harm. Drs. Soranno and Baker will study the differences in heart function and blood pressure following AKI in male and female mice. Preserving blood pressure and heart function after AKI would improve patient outcomes.

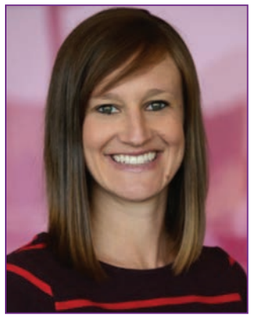
CHELSEA M. MAGIN,PhD, *Division of Pulmonary Sciences and Critical Care Medicine, Departments of Medicine and Bioengineering*

3D-Printed Human Arterial Models to Study Sex Differences in Vascular Disease

Pulmonary arterial hypertension (PAH) is a form of a pulmonary vascular disease that causes high blood pressure in the lungs. It results in impaired blood flow and increased blood pressure which over time causes damage to the heart. This disease impacts men and women differently and the cause remains unknown. One way to learn more about the initiation, progression, and treatment of a disease like PAH is to study how cells from male and female patients respond to signals outside the body. Dr. Magin and an interdisciplinary team create realistic models of pulmonary blood vessels using material with mechanical properties that match the real pulmonary vessel and 3D printing. They aim to use these models to test how cells from male and female patients respond differently to changes in their environment, like stiffening from scarring in PAH, to gain a better understanding of how to cure pulmonary vascular diseases.

To find out about more about CWHR research please visit www.cwhr.org.

Recipients of the Specialized Center of Research Excellence on Sex Difference Pilot Grant



NATALIE NOKOFF, MD, *Section of Endocrinology, Department of Pediatrics*

Impact of Pubertal Suppression on Insulin Sensitivity, Body Composition and Energy Expenditure in Transgender Youth

Nearly 2% of youth in the United States identify as transgender, and many seek treatment to block secondary sex characteristics (such as development of breasts or body hair) that do not align with their gender identity. The effects of puberty blockers on diabetes risk, metabolism, and body composition are not known. In this study, Dr. Nokoff will investigate the effects of puberty blockers on insulin resistance, body fat, and metabolism in transgender youth.

KATHLEEN WOULFE, PhD, *Division of Cardiology, Department of Medicine*

Defining Sex-specific Responses to Elevated Midkine in Cardiomyocytes

Cardiomyopathy is a disease that affects the heart muscle. In dilated cardiomyopathy (DCM) the heart muscle becomes thin, the left ventricle becomes enlarged (dilated), and the heart is unable to squeeze efficiently, reducing the amount of blood that is pumped to the body. Pediatric dilated cardiomyopathy (DCM) affects 1 in 100,000 children, and the prognosis for this disease is very poor. Interestingly, girls with DCM have worse outcomes than boys, and it is unclear why. Dr. Woulfe will study a protein that is found in higher levels in girls with DCM who require a heart transplant compared to girls with DCM who are stable. By determining whether this protein impacts the function of the heart's muscle cells, Dr. Woulfe aims to help develop therapies specific to girls and boys with DCM.

Support the Center for Women's Health Research

If you are interested in learning about ways you can support the Center for Women's Health Research, please contact Elizabeth Hepworth, Senior Principal Gifts Officer, at 303.724.8197.

Thank you to the sponsors of the 2019 Annual Community Luncheon! To learn more about the event, visit www.cwhr.org.

Donor list will be in the Winter 2020 issue of the newsletter.

2019 FACULTY AWARD RECIPIENTS

CWHR Annual Community Luncheon 2019

Adapted from original article by Kiley Kudrna in *CU Anschutz Today*

Mukherjee explained, "If you put male data in, you will get male data out. If you apply that to the other half of the genome, you run into problems and you make mistakes."

Pulitzer Prize-winning author Siddhartha Mukherjee, MD, distills the underrepresentation of women in clinical data down to a simple equation: "If you put male data in, you will get male data out." Studies are only as good as the data available, he said, and without the other half of the genome represented in research, mistakes can be made.

Mukherjee was the featured speaker at our 16th annual community luncheon. Among the 800 benefactors, physicians, scientists and community members were several University of Colorado leaders: CU President Mark Kennedy, CU Anschutz Chancellor Don Elliman, CU Denver Chancellor Dorothy Horrell, School of Medicine Dean John Reilly, MD, and CU Foundation President and CEO Jack Finlaw.

The luncheon began with Judy Regensteiner, PhD, Director and Co-founder of the Center for Women's Health Research announcing the awarding of 10 new seed grants to CU-School of Medicine faculty in the areas of cardiovascular disease and diabetes and the intersection of mental and physical health (read more on page 4).

A previous seed grant recipient and CWHR scientist Elizabeth Wellberg, PhD, discussed her research into the connection between diabetes and breast cancer. Her mother, a breast cancer survivor, inspired her research studies. **One in eight women is at risk for developing breast cancer in her lifetime, and 13.5 million women in the U.S. have diabetes.**

Breast cancer and diabetes are linked to each other in a very complex way, Wellberg explained. "Type 2 diabetes, which is often, but not always, accompanied by obesity, increases the risk for being diagnosed with breast cancer and also confers resistance of existing cancers to conventional therapies," she said. Type 2 diabetes and obesity don't necessarily cause cancer, but they do cause changes in cancer cells that make them resistant to therapy. Wellberg is studying ways to block or reverse some of these changes.

While today's breast cancer treatments are critical to saving lives, common breast cancer treatments, particularly those that block estrogen, actually increase the risk for type 2 diabetes in breast cancer survivors. Wellberg is studying specific drugs and exercise that can be given during breast cancer treatment to prevent diabetes later on. She expressed how imperative the Center for Women's Health Research is in helping her with these studies.

The keynote speaker, Siddhartha Mukherjee, MD, known for his books, The Emperor of All Maladies: A Biography of Cancer and The Gene: An Intimate History, spoke about his career as a physician and oncologist. His presentation "The 'Other Half' of the Genome: Women, Genomics, and the Future of Medicine" stressed the importance of making sure clinical trials and research include women.

He discussed three themes, including artificial intelligence and the genome, personalized medicine and the genome, and the alteration of genomes in humans. He said algorithms are being created that can accurately identify diseases such as malignant melanoma and endometriosis. However, he said, accurate identification is only possible if both genders are represented. The data put into the algorithms depends on the data that has been collected, and he stressed the data must include women. Women are still underrepresented in clinical data, especially for cancers such as colon and lung, but this is slowly being corrected.

In 2001, the first draft sequence was released of the human genome. Most human traits are controlled by multiple genes and most common diseases are polygenic, or controlled by multiple genes. When you read a genome, or the genetic material of an organism, you get someone's propensity for developing a disease. **Mukherjee said the propensity differs a lot between men and women, partly because of genetics, but also partly because of external factors, such as environment and chance.**
Now scientists are studying how genetics intersect with someone's environmental factors. For example, some women have a family history of breast cancer, but have been tested and do not have the BRCA1 or BRCA2 genes. Scientists have now been able to algorithmically look at their genes and can predict their propensity of developing breast cancer to between 80-90%.

Scientists also have the ability to deliberately manipulate genes. Mukherjee said the question now arises: Should we be applying this to human genetics and at what stage? Under what circumstances should we allow these changes? Mukherjee expressed his concerns, "We understand some of the genome in humans, we understand very little of the genome in most humans and we understand very, very little of the genome in one half of humanity."

Clearly, the future of medicine is exciting and complicated, but including women in it is of utmost importance.

Thank you to our speakers and supporters for making the 2019 Annual Community Luncheon a success.
Special recognition to our Leading Benefactors: Arrow Electronics, CU Foundation, Dan & Cindy Caruso, Sharon & Lanny Martin, Mary & George Sissel, and UCHealth.

Visit www.cwhr.org to watch the video and learn more.

Donor Spotlight

Karen Leaffer

Jacqueline's legacy: making a systematic change in women's health research

"In giving to the Center, we would honor Jacqueline and preserve her legacy by bringing systemic changes to women's health research. Jacqueline's gift to the world would be ensuring all women enjoy healthier, longer, more productive lives."

In 1998, Karen and Steve Leaffer were delighted to be starting a family and thrilled by the news that they would be welcoming twins. A sought-after corporate/tax lawyer, Karen worked at her demanding job until the last trimester of her pregnancy when she began experiencing severe shortness of breath and edema. While her obstetrician was not overly concerned about her symptoms, Karen knew that something was terribly wrong. After insisting, she was finally admitted to the hospital in dire cardiovascular distress. Karen presented in the final stages of congestive heart failure, caused by peripartum cardiomyopathy, a weakness of the heart muscle that leads to decreased blood flood to the body's vital organs. There was a high probability that Karen would not survive and her twins were also at great risk. Miraculously, Karen gave birth to beautiful twins, Jacqueline and Jacob, and she pulled through. The twins were cared for in a neonatal intensive care unit, but tragically, baby Jacqueline died two weeks after her birth.

In the wake of a health crisis, Karen found herself thrust into the daunting role of motherhood while coping with the loss of baby Jacqueline. At the same time, her serious heart condition had to be addressed. She embarked on a quest for information about peripartum cardiomyopathy and was determined to find out why her life-threatening heart condition had been missed. It seemed that everywhere she turned, she was dismissed by another doctor. Fortunately, that all changed when she met Dr. JoAnn Lindenfeld, an expert on cardiomyopathy and co-founder of the Center for Women's Health Research. "Dr. Lindenfeld was intense, brilliant, caring and compassionate. She treated me with dignity and restored my confidence in the medical system," said Karen.

Through Dr. Lindenfeld, Karen learned that there was a substantial lack of research about all types of cardiovascular disease in women – not just peripartum cardiomyopathy. In fact, women were at that time still being systematically excluded as subjects in research studies. There was an assumption that what was learned from research on men, could be applied to women as well. Karen found this to be an appalling social injustice – one that cost her daughter her life. Karen and Steve committed themselves to trying to correct the wrong, turning their family's tragedy into a gift of hope for other mothers and daughters.

Dr. Lindenfeld introduced Karen and Steve to the Center for Women's Health Research which was still in its infancy stage. The CWHR's mission of research, education, and mentoring of young scientists with a focus on cardiovascular disease and diabetes struck a chord with the couple. Karen's ongoing search for information surrounding the details of her own illness had uncovered a flawed system and the Center was addressing it head on. After a thoughtful process, the Leaffers made the first major gift to the Center, infusing it with the critical start-up funds it needed. The meaningful gift from the Leaffers was matched by the newly formed Center Advisory Board within one week. "In giving to the Center, we would honor Jacqueline and preserve her legacy by bringing systemic changes to women's health research. Jacqueline's gift to the world would be ensuring all women enjoy healthier, longer, more productive lives," Karen shared.

Since the initial gift in 2005, the Jacqueline Leaffer Foundation has continued to support the Center with a focus on critical research on cardiomyopathy and heart failure and is currently supporting the work of Center cardiologist David Kao, MD, whose bioinformatics research analyzes large data sets to look for risk factors in heart disease and peripartum cardiomyopathy. **"Jacqueline died because of inequities in women's health research. Now after just 15 years, the Center for Women's Health Research and Dr. Kao are actively pursuing the answers we attempted to find more than a decade ago. We have seen the Center's evolution and take great pride in being part of a pivotal moment to bring about change."**

As a past member of the CWHR Advisory Board, Karen's valuable insights and leadership guided the CWHR during a stage of great transition. "Working with the Center has given me so much, and I have had the opportunity to learn from amazing community leaders for whom I have so much respect. The Center is truly an example of what is possible when you combine innovative doctors, academia and community to bring about beneficial change. We hope, and fully expect the Center will become known for its transformational work in this area."

In addition to being a busy mother, Karen is also managing partner of Leaffer Law Group, a firm providing legal counsel to support, advance and guide the work of nonprofit organizations and charitable foundations in Colorado. Karen and Steve remain involved in and generously support the Center. **"The message is getting out. We are closing the knowledge gap in women's health research and changing women's health. Information, however, must continue to be applied to make a difference, so we still have work to do. After all, the lives of our sisters, mothers and daughters depends on it."**

Let's Talk: Conversations about Women's Health Lecture Series

Pivotal Life Transitions

We encounter many challenging physical and emotional transitions across the lifespan. Our complicated, fluctuating hormones trigger physiological changes that push us into the next life stage. Although often viewed as a source of stress and anxiety, transitions can also be a source of invigoration and can open us to many new possibilities.

Dr. C. Neill Epperson highlighted the importance of hormones for brain health in women; Dr. Natalie Nokoff discussed the physical, emotional and cognitive changes that take place during puberty; and Dr. Marsha Guess reviewed the signs and symptoms of menopause and discussed evidence-based treatments for women as they transition to their next phase of aging. **Register for our next Let's Talk lecture at www.cwhr.org.**

- Many female predominant behavioral health and medical conditions (such as depression, anxiety, and dementia) have their onset in puberty and continue until menopause. For males there is a sex bias for a number of neuropsychiatric conditions (such as autism and ADHD) that begins in childhood, suggesting developmental origins for these disorders.
- The average age of puberty is 10.5-11 years-old for girls and 11.5-12 years-old for boys. In girls, obesity appears to be associated with earlier onset of puberty. In boys, the link between obesity and pubertal onset is less clear and may be associated with delayed puberty.
- The average age of menopause in the United States in 51. However, younger women may experience menopause due to various conditions or procedures, such as premature ovarian failure or some types of chemotherapy.

Researcher Spotlight

Kristen Nadeau, MD

"One of the things that I'm most proud of is the fact that I'm now mentoring researchers who have been awarded the CWHR grants."

Dr. Nadeau is a Professor of Pediatrics and was the first recipient of the CWHR Faculty Development Award in 2006. Her research is primarily focused on adolescents with both type 1 and 2 diabetes.

How did you first get involved with the Center for Women's Health Research?

I applied to and received the Center for Women's Health Research first ever pilot grant. I was interested in the CWHR in particular because my research is focused on adolescents with both type 1 and 2 diabetes. In pediatrics, there is a female predominance-type 2 diabetes is more common in girls than in boys. In addition, with type 1 diabetes, it looks like diabetes contributes to an increased risk of cardiovascular disease if you're a female. For both of those reasons, I was interested in looking at sex differences and trying to understand the reason why both of those observations happen with diabetes.

Today, I'm most proud that I'm now mentoring researchers who have been awarded the CWHR grants. I'm in a position to encourage young researchers to go into women's health and sex differences research.

What interested you about this area of research?

As a woman of American Indian descent, I knew that I wanted to pursue a career that would have an impact on the community. Around the time that I was discovering my passion for research, we were starting to recognize the prevalence of type 2 diabetes in adolescence, which has disproportionately affected the American Indian community. Knowing also that there is a lack of research on sex differences with kids who have diabetes, I've been fortunate to combine my research interests and have the support of strong women mentors throughout my career.

Are there any interesting studies/ findings that you've been working on lately?

We completed a study which found that kids with type one diabetes have insulin resistance, which we usually think of as something shown in type 2 diabetes. But people with type 1 diabetes also have a lot of cardiovascular disease risk and it's not really clear why. Even if you do a really good job of fixing blood sugars, cardiovascular disease risk doesn't seem like it's gone away. So we think that insulin resistance is an appreciated factor in type one diabetes.

During a recent study, we treated adolescents with type one diabetes with Metformin, a medicine that's usually used in type 2 diabetes. By incorporating some new techniques in MRI imaging, we were able to detect improvements in the aortic and cardiac health with the Metformin treatment. Previously we've seen that Metformin can help with obesity or lowering insulin dosing. This was very exciting because we could actually detect improvements in cardiovascular health and insulin sensitivity.

If there was one thing that you could communicate about the importance of your research, what would it be?

For kids, obesity is increasing and physical activity is decreasing. And it's creating a major rise in type 2 diabetes that appears to be really difficult to treat. It's important that we work on prevention to try and curb this. Kids need their own unique treatments, and with the heavy predominance of girls being affected, we need to study the sex differences so that we can understand why these girls who are the ones that are really bearing the burden.

Researcher Trainings

Advancing careers in women's health research through academic & career development training

To aid our researchers in their study design and data analysis, the CWHR provides support for a portion of a biostatistician's time. Our biostatistician, Dr. John Rice, gave a training on how to get the most out of working with a biostatistician. His presentation focused on translating research questions into statistical terms and advice on data collection, study design, and hypothesis testing. While scientists must always make some assumptions when they are beginning a research study (especially a pilot study), reviewing the literature and working with a biostatistician can help ensure their study is designed to answer their research question with both statistically significant and clinically relevant data.

Research Presentations

Prateeti Khazanie, MD, CWHR researcher and Assistant Professor in the Division of Cardiology, spoke to the Annual Luncheon host committee at the Denver Museum of Nature and Science. She talked about her career specializing in heart failure research and care. Dr. Khanzanie focuses on the variations in heart failure treatment across the U.S.

Rebecca Scalzo, PhD, CWHR researcher and Assistant Professor in the Divison of Endocrinology, Metabolism and Diabetes, and Jennifer Engleby, Deputy Director at the CWHR met with Ellevate, a networking group for professional women in the Denver area. After Jennifer gave an overview of the work of the CWHR, Dr. Scalzo discussed her research on why women are impacted more severely by type 2 diabetes than men.

Community Presentations

The CWHR is very proud to partner with Arrow Electronics to provide speakers for a quarterly lunch and learn series. This fall, CWHR researcher Dr. Elizabeth Wellberg, PhD, spoke about her research on breast cancer and obesity. Dr. Wellberg was also the featured researcher speaker at our annual community luncheon on September 23, 2019.

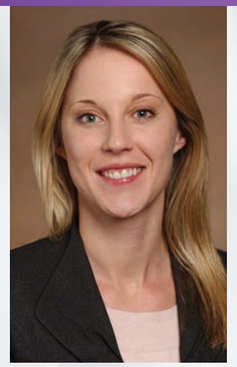
Highlights from the presentation:

Breast cancer risk and prognosis are worsened by obesity.

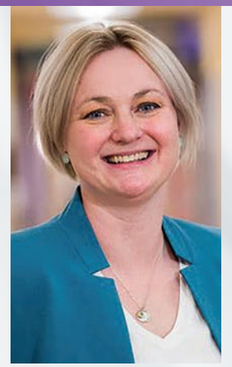
- Weight gain and insulin resistance are underlying drivers in this increased risk for breast cancer.
  - With weight gain, extra calories are stored in fat, and fat tissue growth causes inflammation.
  - Insulin resistance is when your cells don't respond well to insulin. To make up for this, your pancreas makes more insulin, and, over time, your blood sugar levels go up. High blood sugar feeds tumors. Also, your muscle, liver, and fat cells can't take up nutrients, so all the nutrients go to feed tumors.

ACCOLADES to our CWHR Faculty Researchers

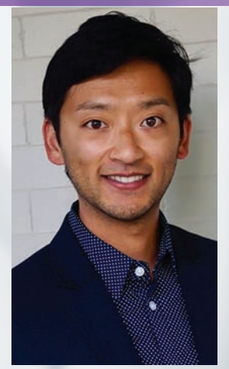
Petter Bjornstad, MD



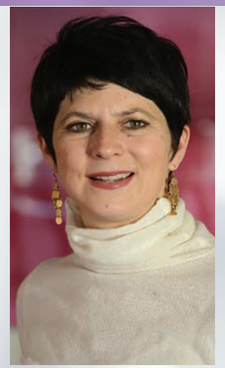
Kristen Demoruelle, MD, PhD



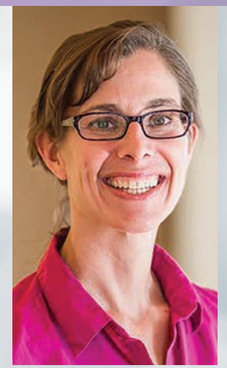
Melanie Cree Green, MD, PhD



Sean Iwamoto, MD

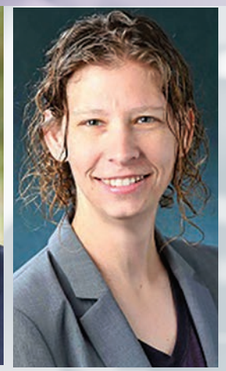


Megan Kelsey, MD

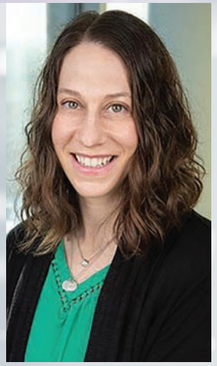


Kristen Nadeau, MD

Viral Shah, MD



Vanessa Sherk, PhD



Stacey Simon, PhD

Lori Walker, PhD

Petter Bjornstad, MD

Received an NIDDK Kidney Precision Medicine Project (KPMP) Glue Grant Award which provides KPMP membership and funds to harmonize and contribute to KPMP biobank and atlas. Dr. Bjornstad is the first KPMP awardee and currently the only pediatric investigator of the consortium.

Kristen Demoruelle, MD, PhD

Received an NIH/NIAMS R61 Research Innovations for Scientific Knowledge (RISK) grant for a project that will investigate the female genital tract and lactating mammary tissue as potential mucosal sites where rheumatoid arthritis related autoimmunity may originate in premenopausal women.

Melanie Cree Green, MD, PhD

Received a Research Project grant (R01) from the National Institute of Diabetes and Digestive and Kidney Diseases that will fund a clinical trial to test a diabetes medication to treat metabolic disease in teens with PCOS. This will be the first trial of its kind in girls with PCOS.

Sean Iwamoto, MD

Received a UNC Nutrition Obesity Research Center (NORC) Pilot & Feasibility Grant, which will allow Dr. Iwamoto to further examine sex, gender, and age-based differences in vascular endothelial function and metabolic profiles, which are markers of cardiovascular disease risk.

Megan Kelsey, MD

Co-investigator on a multicenter R01 grant entitled "Surgical or Medical Treatment for Pediatric Type 2 Diabetes" (ST2OMP). The primary objective of the study is to compare the impact of aggressive medical management versus sleeve gastrectomy on diabetes control in youth with type 2 diabetes.

Kristen Nadeau, MD

Was selected for the Executive Leadership in Academic Medicine (ELAM) fellowship, a highly selective year-long leadership training program for women in medicine. Primary Investigator on a multicenter R01 grant entitled the ST2OMP study "Surgical or Medical Treatment for Pediatric Type 2 Diabetes" (ST2OMP).

Viral Shah, MD

Received a Research Project grant (R01) from the National Institute of Diabetes and Digestive and Kidney Diseases for his study titled, "Bone Health in Adults with Type 1 Diabetes."

Vanessa Sherk, PhD

Received the Rising Star Award at the American Society for Bone and Mineral Research for her work titled, "Metabolic Dysfunction and Pediatric Bone Health."

Lori Walker, PhD

Received a large three-year grant from the Chernowitz Foundation for her study titled, "Elucidating the Mechanisms Underlying Cannabinoid-mediated Changes in Smooth Muscle Contractility".

Melanie Cree Green, MD, PhD, Kristen Nadeau, MD and Stacey Simon, PhD

Co-authored an article in The Journal of Clinical Endocrinology & Metabolism which was chosen for the Endocrine Society Thematic Issue on Women's Health.

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