

# Marshfield Clinic Research Institute

2018 Year in Review



Marshfield Clinic Research Institute

## Mission

We enrich lives through discovery, translation and application of scientific knowledge that improves health and well-being.

## Vision

We will innovate and define the future of health care for generations. Our research will be the source of innovation for the future of disease and injury prevention and integrated health care locally and globally.

## Values

Discovery - Will be the foundation of the overall activities of the research group.

Translation - A major effort will be made to apply our discoveries in the health care setting.

Dissemination - Results of work done will be distributed broadly on a timely basis.

Teamwork - Will be a hallmark of the research group.

Excellence - Will be the standard for all research and program activities.

Collaboration - Partnerships both internal and external will be sought and encouraged.

**On the cover:** Steve Kaiser, manager of the Integrated Research and Development Laboratory, communicates about science to children during the 2018 MCHS Science for Families event.

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# | Connect. Collaborate. Communicate.

***“All the research in the world is not worth very much if you don’t get it to the patients.”***

***- Mr. Melvin R. Laird***

Every year we make new discoveries. There is no doubt that these discoveries enrich lives and improve health and well-being.

But there is another part to our mission – we need to translate and apply this scientific knowledge so that everyone can learn from these new discoveries. This is why every year we use our connections, collaborations and communications to amplify our findings to not only Marshfield Clinic Health System, but also Wisconsin, nationally and around the world.

In our 2018 Year in Review, we are focusing on research that uses connections, collaborations and communications to bring the research results to patients.

Anna Wilson, one of our Research Institute colleagues, made research her career goal as a result of her fight against cancer. Her story is shared on page 4. It is making connections with individuals like Anna that help drive our mission. Her story and many others are the reason I feel compelled on a daily basis to bridge the gap between research discoveries and patient care.

One example where we integrated research and patient care to further collaborate was in establishing the Cancer Care and Research Center. This new center is dedicated to focusing on cancer research and better integrating cutting edge research into the oncology service line. In addition to clinical research, we will leverage the health insurance plan and workforce of the service line, to conduct health service research, care delivery research, molecular oncology research as well as epidemiological research. Our vision is that our clinicians, scientists and care teams can use research to better diagnose, treat and ultimately cure cancer.

On other fronts, precision medicine is rapidly becoming a priority on a national level with significant funding being allocated for implementation and translational research that

seeks to improve outcomes, reduce costs and address deep health disparities in the U.S. The Research Institute has been a leader in this area of research, and has unique infrastructure and scientific intellect to be an internationally-recognized research group.

To further the growth of our strengths in the area of precision medicine, the Research Institute invested well over \$2 million in 2018 and established a new, dedicated research center, the Center for Precision Medicine Research. We further integrated all our scientific expertise and infrastructure in the areas of genetic, computational biology, bioinformatics and biomedical informatics under Precision Medicine Research to leverage the richness at the Research Institute to better meet the mission and vision of this new center.

It also was a proud moment for the Health System as the Research Institute and our key partners were awarded \$60 million over five years by the National Institutes of Health (NIH) to recruit more than 100,000 Wisconsin participants in support of the national *All of Us* Research Program across the state of Wisconsin. More information about our efforts in precision medicine can be found on page 7.

In 2018, we established a centralized Shared Research Support Office and its leadership team to streamline the research processes and focus on gaining efficiency in how research is supported across the Research Institute and Health System.

The leadership team was charged with assessing the quality of services delivered, to identify opportunities for improvement and develop an open communication plan to better support the research mission of our Health System. The Office consisted of two newly-developed offices and one existing office including the Office of Research Computing and Analytics led by Joe Ellefson, the Office of Research Support Services led by Jordon Ott and the Integrated Research and Development Laboratory led by Dr. Jen Meece. More information about the Shared Research Support Offices can be found on pages 13-15.

Fiscal accountability remains one of the top priorities for the Research Institute’s leadership,



and it was a good year fiscally for the Research Institute. Thanks to all the scientists, clinician investigators and staff, the Research Institute's external revenue grew by \$7.25 million, a 34 percent increase from FY 2017. A focused effort by the Research Institute's administrative leadership along with some structural changes to the research support services also allowed us to reduce the funding support we needed from the Health System by \$2.5 million, a 23 percent decrease from FY 2017.

Marshfield Clinic Health System Foundation also helped raise nearly \$4 million for research in 2018. Philanthropy continues to play a pivotal role in supporting the various research studies and initiatives we have.

As health care professionals and researchers, it is also our moral obligation to give back to the next generation of young professionals. Towards that goal, our scientists and staff were active in bringing science to younger generations in many ways in 2018 including supporting STEM educational efforts at the 2018 Wisconsin Science Olympiad, the 44th year of the Summer Research Internship Program and hosting "MCHS Science for Families" during the 2018 Wisconsin Science Festival.

I want to sincerely thank all the scientists, clinician investigators and the research staff for their dedication to science and making a difference in the lives of patients that we serve. Your hard work and effort is truly the reason for the success of the Research Institute. I continue to take pride in this unique organization which is committed to research.

***"Be the change in the world you want to see."- Gandhi***



**Amit Acharya, B.D.S., M.S., Ph.D.**  
Executive Director  
Marshfield Clinic Research  
Institute

### **Curiosity unleashed at Wisconsin Science Festival**

More than 200 children and adults attended the Wisconsin Science Festival, "MCHS Science for Families," an interactive event hosted by Marshfield Clinic Health System Oct. 13 in the Erdman Lobby of the Melvin Laird Center at Marshfield Medical Center.

The event introduced children to the science taking place in their community. Marshfield Clinic Research Institute scientists and staff demonstrated scientific principles with fun hands-on activities such as making ice cream in a ziploc bag, elephant toothpaste, dry ice boo bubbles, iron for breakfast, an archaeological dig and farm safety jeopardy.

"Not only did we succeed in promoting interest in science among youth and their families in our community, but the level of enthusiasm and engagement our staff brought to the event was incredible," said Molly Dowden, one of the organizers of the event and IRB administrator for the Research Institute. "As this was the first year for this event, we weren't quite sure what to expect, but it will surely become an annual occurrence."

The local events were hosted in coordination with events happening across Wisconsin for people of all ages. These events included hands-on science exhibitions, demonstrations, performances and much more.

For more information on this statewide celebration of science, go to [www.wisconsinsciencefest.org](http://www.wisconsinsciencefest.org).



## Cancer Care and Research Center

### Why I now advocate for cancer research

Hearing the words, “You have cancer,” will change the life course of an individual in a nano-second. Those words were said to me over the phone on Dec. 8, 2016. My diagnosis was both ovarian cancer and endometrial cancer. Heartbreaking decisions, a six-hour surgery and chemotherapy followed the diagnoses.

I was fortunate to have Dr. Dale Larson as my surgical oncologist and Dr. Arlene Gayle as my medical oncologist, here at Marshfield Clinic Health System. My cancer care team provided me with the highest quality of care. During the time when I didn't know if I'd be ok, I knew my health care was in outstanding hands.

After my diagnoses and during my treatment, I needed to get as much information as I could about my cancers. I was amazed by how much we have learned as a scientific community about cancer. I found that to be very comforting. It inspired me to learn all I could about oncology research. Oncology research refers to an expansive gamete of topics. It includes everything from prevention to survivorship. Each of these topics is important in the fight against cancer.

As I allowed myself to heal, I set out to find good out of the situation I was in. I asked myself, “What can I do to make this a worthwhile adventure instead of a terrible misadventure?” My instinct told me that I needed to be involved in oncology research.

I was hired as a clinical research coordinator associate at the Cancer Center at Marshfield Medical Center-Eau Claire. It is an incredible honor to be part of the team that helped me get through cancer.

Being a cancer survivor is my passion for the work I do. I have been in the chemotherapy chair and I am still surrounded by the unknown, which is a scary place to be. What made it a lot less scary and continues to make it less scary for me is to know that the work we do in the Research Institute may contribute to the eradication of cancer in the future. That is why I do what I do.

Oncology research continues to make leaps and bounds. However, we have a lot of work to do and I strive every day to be an active member in this field. I am encouraged every time we are able to help a patient by enrolling him or her in a clinical trial or when we open a new clinical trial. It's an exciting time to be in oncology research!



**Anna Wilson**  
Research Coordinator  
Cancer Care and Research  
Center

### New center integrates research and cancer care

Oncology research trials have always been a key aspect of cancer care at Marshfield Clinic Health System, which is now integrated with cancer care for cancer patients and survivors. The Cancer Care and Research Center was established March 2018 and is making this integration possible.

“Having care and research in one center makes the research we do and answers we find the most relevant to our patients,” said Dr. Adedayo Onitilo, Cancer Care and Research Center medical director.

### Team recognized for clinical trial accruals

Dr. Onitilo and his research staff received recognition for being the highest accruing

physician in the country for oncology clinical trials sponsored by the National Cancer Institute's Community Oncology Research Program (NCORP).



## Center for Clinical Epidemiology and Population Health

### A chance to work with world-class research partners

Early in my career at Marshfield Clinic Research Institute, a scientific site visit to HealthPartners Institute in Minneapolis opened my eyes to the promise of multi-site collaboration and altered the path of my scientific career. We were later encouraged by HealthPartners Institute researchers to join them in the Health Care Systems Research Network (HCSRN), a voluntary consortium of 18 research programs that collaborate on multi-site epidemiologic, health services and other population-based research within the context of health care delivery.

With that opportunity in mind, I then applied for an open tenure-track scientist position so I could begin building my own research program, and I led the Research Institute's application to join the HCSRN. Both applications were successful, and I became our primary liaison to the network. In addition to HealthPartners, some of the other highly-regarded collaborators in this national network include Harvard in Boston, Geisinger in Pennsylvania, Henry Ford in Detroit and research programs at eight Kaiser Permanente health systems around the country.

The Research Institute's stable patient population and extensive electronic medical record data archive provides important insights into the causes and progression of disease and on ways to optimize care and outcomes for all patients. However, we can expand our scope and impact by collaborating on studies with HCSRN partner organizations, combining with 1,000 other health system researchers, and links to health care data on more than 10 million patients. This network provides shared insights into research efficiencies and best practices and, importantly, the chance to develop fundable research opportunities that any one site could not establish on its own.



*Greenlee (left) with Kevin Fahey and Rachel Wynn at the 2018 HCSRN Conference.*

Since we joined the HCSRN in 2005, we have participated in several federally-funded research networks in multiple specialty areas. A dozen different Research Institute scientists have been awarded more than \$13 million to support local staff and their work on HCSRN-based research projects. More than half of my research projects have been collaborations with HCSRN colleagues, including two new studies sponsored by the National Cancer Institute: a 5-year study to optimize lung cancer screening in health systems, and a 10-year cohort to identify genetic, environmental and behavioral risks for cancer.

The Research Institute is a great place for a scientist to conduct health care research. Conducting that research in collaboration with individual and institutional colleagues from the HCSRN makes for a rich and rewarding career.

#### **Bob Greenlee, Ph.D., M.P.H.**

Senior Research Scientist  
Center for Clinical Epidemiology and  
Population Health

#### **Jim Donahue receives 2018 Sebold research fellowship**

Epidemiologist Jim Donahue, Ph.D., was named the 2018 recipient of the Gwen D.



Sebold Fellowship for Outstanding Research. The fellowship has been given by D. David "Dewey" Sebold since 1988 to recognize an outstanding medical researcher and support continued research in his or her field.

#### **Study supports annual flu vaccination for kids**

A study found that getting a flu vaccination one year

did not reduce vaccine effectiveness the next year in children, which are findings that support current recommendations for children to be vaccinated annually against influenza. The study was conducted by Huong McLean, Ph.D., and Edward Belongia, M.D., and was published in JAMA Network Open.



### Biomedical informatics leads to faster treatments for patients

It is an exciting time to be engaged in biomedical informatics research where collaborative work among data scientists, medical providers and geneticists is yielding direct significant benefits to our patients, neighbors and families. The goal of our research is focused on translational informatics – which aims to expedite the discovery of new diagnostic tools and treatments for patients through the use of computers. Specifically, my team is involved with several projects that focus around the use of electronic health records, pharmacogenetics and adverse drug event detection.

Our internally-developed electronic health record is one of the oldest and most comprehensive in the country, containing clinical data dating back to the early 1960s. I became interested in using the EHR many years ago and realized its potential for identifying large numbers of patients for research studies. Over the years we have adopted cutting edge technology, such as natural language processing and machine learning, for use on electronic health record data for this purpose.

I have had the honor and privilege to work with several world-renowned scientists from Marshfield Clinic Health System and other academic institutions. Our collaborations have focused around developing machine-learning approaches to predict patients at risk of an adverse drug event or to determine if there are differences in patient outcomes when comparing various medications. The knowledge gained from these collaborations will ultimately influence how physicians care for patients.

One of the most exciting and satisfying research areas that I am involved with is the Precision

Medicine Initiative at the Health System. Our study team has consented individuals, collected their DNA and then genotyped it to identify pharmacogenetics markers.

Pharmacogenomics is the study of how genes affect a patient's response to drugs. We identified the genetic markers for three medications (simvastatin, clopidogrel and warfarin) and then placed messages in the electronic health record that alert physicians, when prescribing a medication, if a change in medication is warranted due to the patient's genetic makeup. We are currently expanding this for more patients and medications.

Finally, I would just like to say that throughout my long career at Marshfield, I have worked with outstanding co-workers. I am truly blessed to work with people who care, love what they do and are always focused on what is best for the patient.



**Peggy Peissig, Ph.D., M.B.A.**  
Director  
Center for Computational and  
Biomedical Informatics

#### **Patient safety and care improved by using computational methods**

Jonathan Badger, research project pharmacist, and Azi (Fereshteh) Bashiri, research specialist, are new talents in the Center for Computational and Biomedical Informatics. Both are focused on improving patient lives by using computational approaches.

This past year Badger has done extensive work developing methods to accurately identify and categorize both fatal and non-fatal patient opioid overdoses using our electronic health records, to better understand how the epidemic is affecting our patients.

Bashiri has focused her efforts on diagnosing cancerous lung nodules using computational methods such as computer vision techniques and deep learning approaches. Accurate diagnosis of lung nodules is critical when prescribing treatment, avoiding unnecessary medical costs, surgery and prolonged hospitalizations.



## Center for Precision Medicine Research

### A shift from genetics to precision medicine

This year marked a shift from research traditionally focused on human genetics to one focused on precision medicine research. Precision medicine is an emerging approach to disease treatment and prevention that accounts for differences in one's lifestyle, environment and genes.

In support of the new mission, the Center for Precision Medicine Research was established November 1, 2018 to more accurately reflect the research being conducted at the Research Institute. All the scientists, staff and relevant infrastructure from Center for Human Genetics is now under the new center.

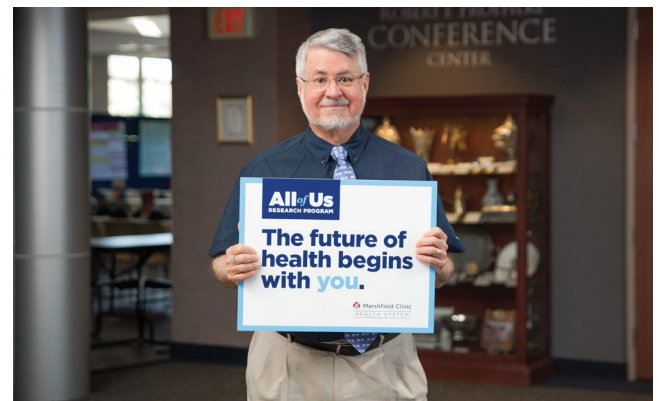
Precision Medicine Research scientists are leaders in their field and have achieved national and international recognition, serving on national planning boards for the National Institutes of Health and other granting agencies, editorial boards and international forums in Switzerland, Ireland, United Kingdom, Spain and China.

Precision Medicine Research was awarded \$60 million over five years by the NIH to recruit more than 100,000 Wisconsin participants in support of the national *All of Us* Research Program. As the lead site, Marshfield Clinic Research Institute has enlisted the University of Wisconsin School of Medicine and Public Health, Froedtert Health/Medical College of Wisconsin and the Blood Center of Wisconsin, Part of Versiti, to recruit rural and urban populations reflecting the rich diversity of the state and national population.

*All of Us* Wisconsin and the national program aim to recruit one million volunteer partners to serve as the largest, most diverse resource of its kind for future precision medicine research.

This resource will consist of genetic or DNA samples, electronic health record-linked data, online surveys and data from mobile health technologies.

Multiple other Precision Medicine Research projects were launched in 2018, including implementing pharmacogenomics and genomic medicine in clinical care to prevent adverse drug reactions and anticipate and treat disease early. Other projects were aimed at customizing treatment options for multiple sclerosis based on the gut microbiome and utilizing the genetic profile of patients to study and develop new cancer treatments. The synergy of clinical care and research will help position Marshfield Clinic Health System to the forefront of precision medicine.



**Murray Brilliant, Ph.D.**  
Interim Director  
Center for Precision Medicine Research

#### Genomic medicine prevention and treatment effectiveness

Scott Hebbring, Ph.D., employs genetic testing as part of clinical care to identify people at increased risk for cancer, cardiovascular and metabolic diseases and to prevent adverse drug reactions (supported by donations and Security Health Plan).

#### Gut microbiome and multiple sclerosis

Sanjay Shukla, Ph.D., and Paula Aston, M.D., received a Clinician-Scientist Collaborative Research Award to investigate the role of gut microbiome in multiple sclerosis, with the aim of identifying new treatment options.

#### Genetic diversity of glioblastoma tumors

Tonia Carter, Ph.D., and Rafael Medina-Flores, M.D., received a Clinician-Scientist Collaborative Research Award aimed at identifying genes and pathways in glioblastoma tumors resistant to temozolomide to help improve survival rate.

## Center for Clinical Epidemiology & Population Health

Our researchers study cancer care and outcomes, vaccine safety and effectiveness, viral respiratory infections, obesity, diabetes, cardiovascular diseases, and other health issues.

### Rural Engagement in Primary Care for Optimizing Weight Reduction (RE-POWER) Study

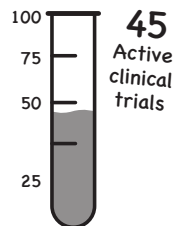
Pending results show about 90 percent of more than 400 enrolled patients lost body weight over the first six months of counseling.



## Clinical Research Center

We support and oversee clinical trials of drugs, devices and biotechnology conducted at the Marshfield campus and at more than 40 regional centers.

We are currently participating in 45 active trials. To date in 2018, we've enrolled more than 450 subjects in 21 different studies, and have conducted more than 1,400 study visits.



## Cancer Care and Research Center

We support and oversee clinical trials of cancer treatments conducted at the Marshfield Clinic Health System cancer centers.

180 active clinical trials,  
2,323 patients screened and  
59 enrolled into clinical trials  
(Wisconsin NCI Community  
Oncology Research  
Program, WiNCORP)

2,323  
patients  
screened



$$E(q^2|x; 2n) = \frac{(2n-1)!}{2(2n-x-1)!(x-1)!} \int_0^1 q^{\frac{x}{2}} (1-\sqrt{q})^{2n-x-1} dq$$

## Center for Oral and Systemic Health

Our vision is to be the global leader in discovery, innovation and translation of cutting-edge research, education and best practices to bridge the chasm between medicine and dentistry.

### Diabetes - Oral Health Integrated Care Model (ICM) Initiative

One of our recent projects in two primary care clinics resulted in nearly 5,000 new oral examinations for patients with diabetes, along with over 600 referrals to see a dentist.

## Marshfield Clinic Research Institute



Largest private medical research institute in Wisconsin.

A division of Marshfield Clinic Inc., we were founded in 1959. We are the largest private medical research institute in Wisconsin, with more than 30 Ph.D. and M.D. scientists and 200 other staff. In addition, approximately 150 physicians and other health care professionals throughout

## Office of Research Compliance

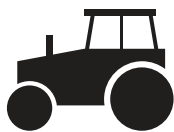
Resource on topics such as FDA, OHRP, NIH regulations, compliant clinical trial billing, investigator conflicts of interest, human subjects protections, good documentation practices, research and HIPAA.

1,325  
compliance-related  
inquiries answered.



## National Farm Medicine Center

Our mission is to improve the health and wellness of rural and agricultural communities through research, education and outreach. Farm Medicine is also home to the peer-reviewed Journal of Agromedicine.



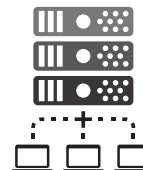
### 38 years

Established in 1981; the largest continuously-operating center devoted to agricultural health and safety in the U.S.

## Center for Computational and Biomedical Informatics

Our scientists study ways to reduce or detect Adverse Drug Events (ADEs) using machine learning.

More than 2 million patients suffer severe ADEs annually in the U.S.



## Institutional Review Board

Approves, monitors and reviews all research conducted within Marshfield Clinic Health System. Protects research participants' rights and welfare.

**357** new and continuing research studies reviewed by the IRB



## Externally-Funded Projects in 2018: \$28 million



the Health System are engaged in medical research.

Our mission is to enrich lives through discovery, translation and application of scientific knowledge that improves health and well being.

$$f(x) = \frac{2^{(1-n/2)} x^{(n-1)} e^{-(x^2)/2}}{\Gamma(n/2)}$$

## Center for Precision Medicine Research

We focus on research on the structure of the human genome and the hunt for genes that influence human health disorders.

**DNA SAMPLES 18,229**

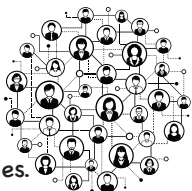


Personalized Medicine biobank: 18,229 unique DNA samples directly genotyped in 2018 for more than 25 million genetic markers.

## Clinical Medicine & Research

An indexed journal (<http://www.clinmedres.org/>) published by Marshfield Clinic Health System; edited within the Research Institute for 16 years.

Received manuscripts from **14** countries and published articles were cited **1,601** times.



$$P(v_n) = \frac{n [F(v)]^{n-1} f(v)}{n}$$

## Integrated Research and Development Laboratory

Supports research projects being undertaken within Marshfield Clinic Health System, as well as with external collaborators in industry and academia.



**20** team members



**318** years combined institutional tenure



### Poor oral health is more complex than a lack of brushing and flossing

Early in my dental hygiene career I came to the realization that my patient's oral health issues, including dental caries, gingivitis and periodontal disease, were not simply from poor brushing and flossing habits.

The lack of improvement in oral disease despite efforts by the patient leave the patient and clinician feeling frustrated, and also contributes to chronic oral and systemic health problems. The nagging feeling that there was more to my patient's oral health than just clean teeth prompted me to seek a master's degree in dental hygiene.

From the clinical perspective, this degree helped me address systemic health issues with dental hygiene patients and improve overall health. Reading research was not enough for me. I also wanted to be involved in the research.

While going through the dental hygiene assessment process with my patients, I continuously try to put together the various aspects of their lifestyle, health history and oral presentation to determine if a systemic health issue is affecting their oral health and if a medical referral is warranted.

As a team member with the Center for Oral and Systemic Health, I am able to be part of the research process and contribute clinical experience to research projects. My role includes providing assistance with developing research designs, strategies for data collection and management, conducting protocol assessments, recruitment of human subjects, conducting oral examinations as well as searching for relevant literature, and assisting with writing manuscripts for publication.

With the significant research already contributed by Oral and Systemic Health regarding integrated health systems, allied health cooperation, oral health literacy and improved oral and systemic health outcomes, we can one day close the gap between oral and systemic health care. One of the best parts of being involved with research at Oral and Systemic Health is being able to bring back all of my new-found knowledge to my patients, coworkers and other health providers. Areas in which I have researched, published and presented on include the topics of multiple sclerosis, the oral health of Wisconsin farmers, oral health literacy and detecting sleep quality concerns during an oral examination.

As an advocate for the dental hygiene profession, I encourage allied health care providers to incorporate dental hygienists into their systemic health treatment plans. Hopefully, my excitement and persistence regarding oral and systemic health will help encourage and enlighten patients and health providers on the close connections between the mouth and the body.



**Kelly Schroeder, R.D.H., B.S., M.S.**  
Dental Hygienist – Research  
Center for Oral and Systemic  
Health

### Scientist attends oral medicine workshop in Sweden

Ingrid Glurich, Ph.D. (bottom left) attends World Workshop on Oral Medicine VII Initiative in Sweden.



### Low oral health literacy can lead to emergency visits for dental care

Research conducted by Jeffrey VanWormer, Ph.D., and Amit Acharya, B.D.S., Ph.D., from the Center for Oral and Systemic Health found that patients with a poor understanding of oral health go to the dentist less and the emergency department more, for dental needs.

The study was published in the Journal of Rural Health and was funded by the Research Institute internally through philanthropic support from Marshfield Clinic Health System Foundation's general medical research fund. Study analyses were completed by Sailee Tambe, a master of public health student who took part in the Summer Research Internship Program with the Research Institute.



## Clinical Research Center

### Mobile data collection brings several advantages

This year was the start of exciting changes at the Clinical Research Center. Through participation in recent industry-sponsored trials, we have access to mobile device-based methods of data collection. Patients can now monitor for and report adverse drug events and symptoms to the research team in real time using study-designated smartphones or tablets. Electronic methods of data capture have numerous advantages, including:

- Improved patient compliance with reporting activities.
- Rapid communication among study team members and patients.
- Minimal to no costs associated with printing, mailing and storage of paper forms.
- Reduced costs associated with data entry.

Integrating mobile-based data collection methods in clinical research workflows may serve as a springboard for future enhancements in general practice, particularly in the areas of patient-provider communication and patient monitoring. We anticipate increased use of applications for research use in future studies and are educating providers and nursing staff on the benefits of these technologies for patient care.

Clinical Research staff members continue to leverage our collective expertise and established relationships with clinic and research staff to connect patients to innovative therapies through participation in academic and industry-sponsored clinical trials. As experts in infectious disease, we have been involved in numerous studies in the areas of infectious disease control, antibiotic and probiotic

development, and vaccine safety and efficacy over the past year.

Notable work includes vaccine studies and treatment trials for *Clostridium Difficile* (C. Difficile) as well as efficacy studies for pneumococcal diseases. C. Difficile is a toxin-producing bacterium present in the gastrointestinal tract of at-risk patients that induces gastrointestinal distress and colitis under favorable growth conditions, including during periods of prolonged antibiotic use.

We also work with the staff of the Center for Clinical Epidemiology and Population Health to monitor the safety and efficacy of vaccines through the Centers for Disease Control Vaccine Safety Datalink and collaborate extensively with other Research Institute centers on a variety of studies ranging in focus from rare diseases to system-wide application of novel care delivery interventions.



**Matthew Hall, M.D.**  
Infectious Disease  
Marshfield Clinic Health System



**Ray Haselby, D.O.**  
Emeritus Researcher  
Clinical Research Center

### Clinical trials of new epilepsy treatment performed at Research Institute

A new device that reduces seizures in epilepsy patients was approved by the Food and Drug Administration in April, some 13 years after clinical trials were held at Marshfield Medical Center by the Research Institute.

Neurologist Dr. Evan Sandok and his research team found seven participants for the study, which was tied for the third most out of the 13 centers participating in the research.

### Research Institute contributes to Cardiovascular Inflammation Reduction Trial

We were an integral part in research that found taking

low-dose methotrexate does not reduce additional cardiovascular events in patients with either diabetes or metabolic syndrome. The Cardiovascular Inflammation Reduction Trial (CIRT) was a 5-year study conducted by the National Institutes of Health. Dr. Mateen Abidi and Dr. Shereif Rezkalla were investigators on the study.

## National Farm Medicine Center

### Collaborating for safety, connecting farm and medicine

I was very proud to serve on the Executive Committee for Farm Technology Days – Wood County, helping facilitate Farm Medicine’s role in this summer’s grand event. Farm Tech Days and Farm Medicine came together for the largest presence of agricultural health and safety demonstrations in the 60-year history of the event. This successful collaboration was built on quality connections with local farm families, rural fire departments and other partnerships Farm Medicine cultivates.

We provided families with hands-on demonstrations of safe play areas, agricultural youth work guidelines and general safety for rural homes in the Future Generations area. These demonstrations disseminated evidence-based practices developed in the National Children’s Center for Rural and Agricultural Health and Safety (a CDC Center of Excellence housed in Farm Medicine).

Rescue demonstrations for grain entrapment and tractor rollover were especially popular, drawing more than 100 spectators at times, including dignitaries such as the host farm families and Governor Scott Walker. Chief Jerry Minor organized and led five local fire departments in these activities. Alongside the rescue demonstrations were injury and illness prevention demonstrations. This paired very well with the tractor rollover rescue demonstration and Farm Medicine’s rollover protection structure rebate program.

This collaboration would have not been as successful without Farm Medicine’s meaningful, long-term connections with the Sternweis farm and family, the Heiman farm and family, and Nasonville Dairy. These farm families and their businesses have been generous philanthropic supporters of our research and outreach efforts for many years.



*Bendixsen (center) with colleagues and Farm Technology Days committee co-chairs Maree Stewart (left) and Melissa Ploeckelman (right).*

They also have helped facilitate important research projects ranging from child injury prevention to the exploration of the dairy microbiome.

Farm Medicine’s ongoing and multi-faceted collaboration with Minor and the Pittsville Fire Department proves to be an invaluable connection time and time again. Minor organized the five volunteer fire departments and the materials needed for each rescue demonstration. This also included an eye-grabbing ladder-truck with an overhead camera display, allowing guests to have an up-close view of how grain engulfment rescues work. My work with Minor has grown over the years, continuing to build on our shared belief that rural fire and EMS can do more in the prevention of agricultural injuries.

There were many other important connections that helped make this collaboration possible and I sincerely appreciate their support.

**Casper Bendixsen, Ph.D.**  
Research Scientist  
National Farm Medicine Center

#### Journal of Agromedicine

The Journal of Agromedicine, edited by the National Farm Medicine Center since 2004, is accessible to 2,600 institutions worldwide. The journal received a record 17,158 article downloads the past year and posted its best-ever Impact Factor of 1.322, making it the world’s leading source of peer-reviewed agricultural safety and health information.

#### Inaugural child agricultural injury prevention workshop draws nationally

The National Children’s Center for Rural and Agricultural Health and Safety hosted the inaugural Child Agricultural Injury Prevention Workshop in Marshfield, Aug. 14-15, 2018, sponsored by John Deere and ProVision Partners. The successful event drew participants from across North America. Farm organizations, insurance companies, health

care systems, Extension, government agencies, media and agribusinesses were represented. “By working with other organizations we can get the information and resources to farmers and ranchers, enabling them to implement safety strategies,” said Marsha Salzwedel, M.S., workshop director. Westfield Insurance announced it will help support three 2019 workshops in Iowa, Kentucky and Pennsylvania.

## Integrated Research and Development Laboratory

### Team collaboration highlights a successful year

The past year in our lab has been filled with memorable landmarks and accomplishments. We are privileged to count among our team Wayne Frome who has dedicated 50 years to Marshfield Clinic Research Institute. A graduate of the University of Wisconsin-Stevens Point, he celebrated this accomplishment in January 2018. The faces and methods have changed in those years, but Wayne's dedication, attention to detail and passion for research have not faltered. I can only humbly say thank you.

Service and commitment run deep within the laboratory. Our need to adapt to new methods in an increasingly regulated environment required adding infrastructure into our leadership team with the hiring of project manager, Brooke Olson. Among her responsibilities are to implement quality laboratory management principles into all aspects of laboratory science conducted in the laboratory. Brooke is working closely with some of our team leads including Steve Kaiser, Tammy Koepel, Lynn Ivacic, Elisha Stefanski, Sherri Guzinski, Nan Pan and Rachel Schoone to implement such practices.

The Research and Development Laboratory also successfully recruited an expert microbiologist with more than a decade of experience to help us bring new collaborative opportunities advancing laboratory medicine. Cory Pike joined our team in September and is helping with several studies conducted collaboratively with colleagues in Marshfield Labs. We are building a strong team with Erin Donnerbauer and Nidhi Mehta supporting these collaborations.

Our work on infectious diseases of importance to our patients continues with Dr. Anna Schotthoefer leading the charge in tick-borne diseases. My own research in blastomycosis continues with the tremendous scientific input from Jennifer Anderson who also happens to be the key individual along with Thao Le in our next generation sequencing technology.

Our work and support of the *All of Us* Research Program is being supported by the efforts of Lisa Ott, Kai Qi Zhang and Ram Shrestha. This work leverages our long history of supporting genetics research at the Research Institute.

I cannot thank Pat Stockwell enough for being our "equipment whisperer". Pat makes sure our equipment is in top notch running condition through coordination of service agreements, arranging service or digging in himself to get a piece of stubborn equipment back online.

While individual efforts are recognized in specific areas, make no mistake our teams are complex and staff are managing multiple projects on a daily, weekly and seasonal basis. I am honored to lead this group and look forward to more great work in 2019.



**Jennifer Meece, Ph.D.**  
Director  
Integrated Research and  
Development Laboratory

#### **Lyme disease scientists participate in biobank**

As the only Midwest health care system in the national Lyme Disease Biobank, the Research Institute enrolled patients suspected to be in the early stages of Lyme disease to aid in the research of this disease that frequently infects Wisconsin residents.

#### **Clinical Research Unit provides valuable research space**

The Clinical Research Unit provides a convenient location for patients to participate in research studies and clinical trials. Located within Marshfield Medical Center in Marshfield, the Clinical Research Unit provides a clinical setting for participants to consent for studies, have

samples collected and undergo physical examinations that are required of study participants. This location was home to the *All of Us* Research Program, and many clinical trials including those originating in many of our centers. This resource is invaluable to our ability to compete for grants and contracts and greatly improves our patient experience.

## Office of Research Support Services

### Inaugural year leads to completion of important initiatives

This was the inaugural year for the Office of Research Support Services. Established as one of the three shared service offices, we provide the basis of research administration and support helping those engaged in health sciences and community outreach.

Furnishing key support areas such as Sponsored Programs, the Institutional Review Board/Human Subjects Protection, Scientific Writing, Publications, Research Navigation and Project Management, the essence of Research Support Services is providing and promoting connectivity, collaboration and communication to enhance our research mission.

I became director of the Office of Research Support Services in February 2018. What I gained was a well-established team of motivated professionals. I have been involved in research administration for more than 20 years and have worked at several research organizations including Johns Hopkins University, University of North Carolina, Chapel Hill and most recently, University of Wisconsin, Extension. What I have found here is admirable. The level of professionalism and the dedication to integrity among scientists, research staff and administrative staff is top notch.

#### KEY INITIATIVES FOR 2018:

##### Connections

- Continued development of administrative support electronic systems to enhance performance, reporting and efficiency in conducting research.
- Maintained or enrolled staff into professional organizations.

- Worked with Division of Education to align resources for resident research.
- Completed a review of compliance needs related to uniform guidance.
- Began development of the research navigator program to assist investigators in launching new research projects.

##### Collaborations

- Established key relationships between centers, Health System administration and Health System shared services.
- Initiated a relationship with UW-Extension to establish support for business technology and development.
- Engaged scientific and clinical experts as new reviewers and editors for Clinical Medicine & Research, our peer-reviewed, medical research journal.

##### Communications

- Initiated a SharePoint site to provide resources allowing staff and colleagues easy access to pertinent research information.
- Established a communications committee to oversee and review process and publication of information.



**Jordon Ott**

Director  
Office of Research Support  
Services

### Research symposium shows off research completed by interns

It has become an annual tradition that is eagerly anticipated at the Research Institute. Every August, the Summer Research Internship Program (SRIP) concludes with a showcase of the interns' research through a symposium format in Marshfield Medical Center's Froehlke Auditorium.

This year's symposium, held on August 9, marked an end to an eventful summer for 11 interns.

The summer internship provides an experience tailored to each student's skill level and is related to ongoing research within Marshfield Clinic Health System. The program enables students to put their education into practice as they work side-by-side with scientists and

clinician-researchers who are experts in their fields.





## Office of Research Computing and Analytics

### Collaborating with universities to provide web-based data collection

The Office of Research Computing and Analytics enriches lives through superior health care informatics, technology, application and service. We strive to be the primary resource for technological innovation, analysis and service for all Marshfield Clinic Health System research.

Since 2014, we have been able to utilize a tool developed by Vanderbilt University, through our Clinical and Translational Sciences Award, called Research Electronic Data Capture or REDCap. REDCap is a web application for designing data collection instruments, surveys and databases. Our REDCap administrators, Leila Deering and Chris Kadolph, are actively involved in the worldwide REDCap consortium, which is comprised of 3,085 institutions in 125 countries.

REDCap was designed by researchers and can collect all types of data needs including 21 CRF Part 11, FISMA and HIPPA-compliant environments. Researchers have the power to control access to their REDCap databases through the user rights. User rights can restrict access to specific forms and to data exports.

REDCap has many features to allow researchers the capability to design and build their custom data collection solutions for research. REDCap also has advanced features that allow the user to use calculated fields, file uploading, auto-validation, branching/skip logic and survey stop actions. Research Computing and Analytics has been involved with expanding REDCap functionality using custom development and plug-ins to help users use REDCap as a case management tool. REDCap can be used for many purposes

including survey administration, multi-site study collaboration, operational support, data collection, adverse event tracking and longitudinal studies.

Two of our custom efforts include the build-out and support of the Community Connections Team database for Marshfield Clinic Health System and the HOPE Consortium health information exchange platform funded by a grant made to Family Health Centers from the state of Wisconsin. Community Connections Team uses REDCap to connect patients in need to various local resources. Research is conducted on patient improvement in labs and emergency department visits before and after Community Connections Team interventions. The HOPE Consortium is using REDCap to track visits for patients diagnosed with opioid use disorder. Research will be conducted to look at patient interventions and outcomes using the collected data.

In 2018, Research Institute instances of REDCap housed 204 production projects, 96 development projects, 197,840 records and 224 active users. To learn more about REDCap, you can visit [www.projectredcap.org](http://www.projectredcap.org) or contact a Research Computing and Analytics representative.



**Joe Ellefson**  
Director  
Office of Research Computing  
and Analytics

### Research Institute donates clothing to Best First Day

More than 110 new clothing items were donated August 6 to the Best First Day project, which aims to support local families in dressing their children as they begin a new school year.

The vision of Best First Day is to enrich the lives of our future by having every kid dressed with

confidence. This was a project selected by one of the 2017/18 Leadership Marshfield teams.



### Soup drive for United Way

There were no restrictions at a soup fundraiser for United Way. In fact, it was the antithesis, since the more soup you wanted the better because it was a fundraiser for the Marshfield Area United Way campaign. Because of generous and plentiful consumers, the event raised \$2,100.

## How your gifts support research

Thank you to all who supported Marshfield Clinic Research Institute last year. Your generosity helped raise nearly \$4 million for research in 2018.

Because of you, our scientists can continue groundbreaking research that makes a

real impact to improve health care in the communities we serve.

Whether you attended an event, chose to give in honor or memory of a loved one, made a legacy gift or offered continued support, you are enriching lives through research.

## Your gifts helped make the following possible this year:

- New hope for cancer patients...The Cancer Care and Research Center was established to offer patients personalized treatments and access to groundbreaking cancer treatments.
- Personalized care options...Funding for the Center for Precision Medicine Research will allow physicians and scientists to develop treatment plans based on individual patient needs.
- Investing in the future of research...A new postdoctoral fellowship will support up-and-coming scientists as they embark on their careers, as well as enhance innovation throughout Marshfield Clinic Health System. This fellowship is made possible by a gift from the estate of Frank and Betty Koller.
- Caring for our littlest patients...A matching gift and support from the Midwest Athletes Against Childhood Cancer (MAACC) Fund resulted in over \$100,000 of support for pediatric cancer research at the Research Institute.
- Pioneering support for a rare disease... Ongoing support for the Clinical Registry Investigating Bardet-Biedl Syndrome (CRIBBS) has allowed the program to expand to over 400 patients, offering hope and pioneering treatments for this rare disease.
- Caring for rural communities...New research into farmer mental health and agricultural childhood injury prevention will support wellness for rural Wisconsin farmers and their families.



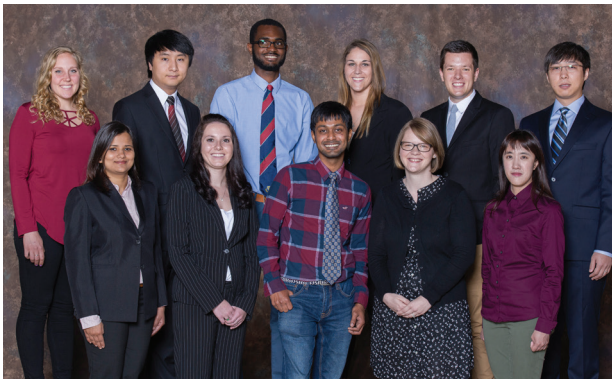
*This year's Auction of Champions raised more than \$260,000 for Farm Medicine, including a record \$55,200 for the Fund-a-Need auction supporting a Mental Health First Aid program for local farmers*



*A legacy gift made by the late Frank and Betty Koller, pictured with their friend Mel Laird, is now funding a postdoctoral research fellowship to advance innovation and education at Marshfield Clinic Health System.*

*"Invaluable support from our donors enables Health System clinicians and scientists to better serve our patients by translating research discoveries into care delivery. Gifts to research have a lasting impact on scientific discoveries, enabling us to better care for our communities."*  
- Dr. Amit Acharya, executive director, Marshfield Clinic Research Institute

- Supporting the next generation of scientists...The Summer Research Internship Program hosted 11 students in 2018. This program pairs students with Research Institute scientists to prepare the students for careers in research. Since 1974, our Health System has hosted over 200 college undergraduate and graduate students. The program is completely donor-funded.



*Marshfield Clinic Research Institute's summer research interns presented at the annual Research Symposium on August 9.*

## Your gifts at work

A dedicated student and athlete, Ryan Dieringer and his family were shocked when Ryan was diagnosed with Ewing Sarcoma, a pediatric bone and soft tissue cancer at just 16 years old. After receiving treatments close to home at Marshfield Medical Center, Dieringer was declared "no evidence of disease" just over one year later and is now a sophomore in college.

Dieringer and his family know firsthand the importance of medical research. Thanks to clinical trials and new treatments available through Marshfield Clinic Research Institute, Dieringer received the support he needed to battle cancer and get back on the basketball court.



**You can make a difference for research through Marshfield Clinic Health System Foundation**

**To support Marshfield Clinic Research Institute, please contact Karen Piel at [piel.karen@marshfieldclinic.org](mailto:piel.karen@marshfieldclinic.org) or 715-389-3868.**

**Learn more about giving to research at [www.marshfieldclinic.org/giving/support-research](http://www.marshfieldclinic.org/giving/support-research)**



# Marshfield Clinic Health System

1000 N Oak Avenue  
Marshfield, WI 54449

[marshfieldresearch.org](http://marshfieldresearch.org)

715-387-5241 • 1-800-782-8581



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