ROCKEFELLER Summer 2019 INSTITUTE at WEST VIRGINIA UNIVERSITY



Then-Governor John D. Rockefeller IV

and his mother, Blanchette Rockefeller.

(Photo: R. Corkery/NY Daily News Archive via Getty Images.)

Dear Friends,

The Rockefeller Neuroscience Institute (RNI) is unlocking mysteries of maladies that can strike at

the very heart of our humanity and affect us to our souls. My sisters and I felt helpless as the ravages of Alzheimer's stripped our mother, Blanchette Hooker Rockefeller, of her ability to appreciate music, art, and loved ones. The disease stripped her of her dignity. It extinguished the light from her blue eyes.

Heart-broken, Hope, Alida, Sandra, and I knew that we must do everything in our power to end that kind of suffering. And, I knew that West Virginia, a place where people are driven by

passion and purpose, was the right place to fulfill that mission. Two decades ago, my sisters and I helped to found an institute that would begin that journey.

Today, we celebrate the promise that is being realized. The Rockefeller Neuroscience Institute

has attracted brilliant minds to Morgantown with the opportunity to engage in purpose-driven work

> with a sense of urgency. Dr. Rezai and the entire RNI team are making groundbreaking progress with first-in-the-world treatments and unprecedented partnerships.

Charles Rockefeller: Clav Marsh, MD: Laurie

Erickson; Gordon Gee, JD, EdD.

The global impact of new treatment options for devastating neurological disorders and the RNI's expanded focus on addiction research can be transformative and life-giving. My vision was that advances in neuroscience would one day bring hope to families like mine. The RNI is taking us there.

Be well,

Jay Rockefeller

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"The Boundless Brain" mural, a depiction of half a million neurons in the human brain, adorns the lobby of the Rockefeller Neuroscience Institute Innovation Center. The mural was created by Greg Dunn and Brian Edwards.

MESSAGE FROM THE EXECUTIVE CHAIR

I was drawn to West Virginia for the incredible opportunity to establish the Rockefeller Neuroscience Institute with the compelling vision and commitment of Senator John D. Rockefeller IV and the leadership of West Virginia University. Deeply rooted in a culture of passion, purpose, and collaboration, the RNI is a unique institute with a bold vision of advancing brain health and innovation in the treatment of neurological disease. We are bringing together the brightest minds in research and patient care, deploying the latest technology solutions, and fostering key relationships with academic, private sector, and governmental partners.

In our inaugural year, we have pioneered clinical trials to treat Alzheimer's disease using focused ultrasound to open the bloodbrain barrier and to help those with chronic pain using a novel non-opioid micropellet drug delivery technology. We have also deployed one of the largest longitudinal machine-learning and predictive data analytics frameworks in neuroscience with over 35,000 individual participants to date.



Rezai, MD

WVUMedicine,

WE ARE IMPROVING LIVES BY ADVANCES IN BRAIN HEALTH.

"We care deeply about our patients and families in West Virginia, across the country, and around the world; our boldest aspiration is to make their lives better, one person at a time."



RNI IN THE NEWS

Collision: No more neurodegeneration?

The British Medical Journal's Ashley McKimm interviewed Dr. Rezai at Collision, North America's fastest-growing tech conference. May 23, 2019

Ali R. Rezai, MD

With the latest technologies, an ecosystem of partners, and a truly integrated approach, we are making tangible progress. Our breakthroughs in neuroscience are strengthening our efforts to combat public health challenges ranging from addiction to Alzheimer's. Our collaboration with elite athletes and members of the military in optimizing human performance are leading to new innovations. We are breaking barriers in research and patient care to better serve the people of West Virginia and beyond.

Learn more about the RNI's first-in-the-world clinical trials and the top-caliber experts joining us in our mission by visiting WVUMedicine.org/RNI

We care deeply about our patients and families in West Virginia, across the country, and around the world; our boldest aspiration is to make their lives better, one person at a time. Our team is passionate about the RNI and the opportunity to break barriers in neuroscience, impacting patient care and tackling the big public health challenges facing us.

We hope you enjoy learning more about the RNI and look forward to sharing our outcomes as we progress.

Warm regards,

Executive Chair. RNI John D. Rockefeller IV Chair in Neuroscience

WVU MEDICINE AT-LARGE

WVU Medicine is the state's largest health system and private employer. Comprised of 18 hospitals and nearly 100 clinics, the WVU Health System's mission is to improve the health of West Virginians and all the people we serve through excellence in patient care, research, and education.



MEMBER SYSTEM Hospitals

- 1. J.W. Ruby Memorial Hospital, WVU Medicine's flagship hospital in Morgantown
- 2. United Hospital Center
- 3. St. Joseph's Hospital
- 4. Braxton County Memorial Hospital
- 5. Reynolds Memorial Hospital
- 6. Potomac Valley Hospital
- 7. Berkeley Medical Center
- 8. Camden Clark Medical Center
- 9. Jefferson Medical Center
- 10. Summersville Regional Medical Center

MANAGED HOSPITALS

- 11. Wetzel County Hospital
- 12. Jackson General Hospital
- 13. Garrett Regional Medical Center
- 14. Wheeling Hospital
- 15. Harrison Community Hospital

AFFILIATE HOSPITALS

- 16. Davis Health System
- 17. Broaddus Hospital
- 18. Barnesville Hospital

ROCKEFELLER NEUROSCIENCE INSTITUTE STRUCTURE COMPREHENSIVE. INTEGRATED. PATIENT-CENTRIC.

The Rockefeller Neuroscience Institute (RNI) is the premier multidisciplinary institute for patient care, research, and teaching in West Virginia and the region. The RNI's flagship facilities are located on the Health Sciences campus in Morgantown, with more than 1,000 dedicated team members across four departments, patient care units, and research laboratories.

The RNI facilities on the WVU Health Sciences' main campus in Morgantown.



"The RNI is designed to be both a worldclass research institute and a healthcare provider to a diverse patient base. This dual function gives the Institute unparalleled insight into the issues facing real patients, as it works to tackle the world's biggest health challenges."



Albert L. Wright, Jr., PharmD, MHA President and CEO, West Virginia University Health System

RNI BY THE NUMBERS CY 2018



Telemedicine offers patients in remote locations access to world-class care offered at WVU Medicine with the use of telecommunication technology.

The RNI has a rapidly growing telemedicine program that treats three specialty areas:

LOGY TELEN







The RNI recognized the outstanding performance of faculty, trainees, and staff on July 11, honoring each with a 2019 RNI Excellence Award.





Stroke Center 2018 GUIDELINES

The RNI implements personalized, neurosciencebased strategies to oversee the monitoring, assessment, recovery, and improved performance for

MILITARY PERSONNEL AND ATHLETES

MULTIDISCIPLINARY TEAM

Integrated across disciplines

A key strategic initiative for the RNI is the development of multidisciplinary centers with a focus on holistic patient care. In its first year, the RNI expanded the centers listed below, integrating multiple disciplines and forming a team of specialists. The team coordinates a comprehensive approach to optimize the diagnosis, management, and treatments of those impacted by neurological disorders. Planning is underway for future multidisciplinary centers.

MULTIDISCIPLINARY CENTERS 2019





DISORDERS **NEUROMODULATION NEURO-ONCOLOGY SPINE STROKE**

TEAM OF SPECIALISTS FROM:

Administration	Neuroscience	
Anesthesiology	Neurosurgery	
Biomedical	Nursing	
Engineering	Occupational	
Clinical Labs	Therapy	
Computer Science	Pharmacy	
Data Science	Physical Medicine	
Exercise Physiology	and Rehabilitation	
Experimental	Physical Therapy	
Psychology	Physiology	
Neurology	Psychiatry	
Neuropsychology	Social Work	
Neuroradiology	Speech Pathology	

"Innovation in healthcare is important so that we can restore health more quickly and completely - a particularly important task in West Virginia and our region since patients frequently need to Judie Charlton, MD travel far for care. We are getting closer Chief Medical Officer, WVU Medicine to this goal with our innovations." and University Health Associates



RNI treated its first esser al tre cused ultrasound, resu nor and marking a 'fi

BRAIN HEALTH FOR EVERYONE

n June 18, 2019,the m

In addition to addressing neurological disorders, the multidisciplinary RNI team is studying the neuroscience of brain health with personalized assessments, prescriptive recovery, and health optimization strategies linked to:

- / Cognitive Enhancement
- / Exercise
- / Meditation and Mindfulness
- / Neuromodulation
- / Nutrition
- / Sleep and Circadian Rhythms
- / Stress and Brain-Body Connections





"Feed Our Brains" Outreach Program



To support their campaign, WVU Neuroscience students launched a t-shirt fundraiser.

DEPARTMENT OF NEUROSCIENCE

A hub for innovation and discovery

The newly created Department of Neuroscience is the RNI's intellectual hub for basic and foundational research and translational applications. Chair Randy J. Nelson, PhD, says, "Building a new home for brain research and education is an incredibly exciting opportunity. We're linking interdisciplinary resources in imaginative and creative ways."

As an example of nimble translation of animal research at the RNI, our team published papers showing the negative effects of dim light at night on animal recovery after stroke or cardiac arrest. Within months, we have started a clinical trial to examine the role of lighting on patient recovery in

the cardiac intensive care unit."

Dr. Nelson leads a team of 18 primary and more than 50 secondary faculty with plans to significantly increase faculty size.

New collaborations, new opportunities

Cross-departmental collaborations exponentially expand reach and scope. "By integrating neuroscience research with other disciplines, we can help patients, create novel opportunities for our staff and students, and provide economic benefits for our state," says Dr. Nelson. "Working closely with our clinical colleagues to translate basic research rapidly to the clinic is a major goal of the new department."

DEPARTMENT CHAIR

Randy J. Nelson, PhD, Director of RNI Basic Science Research, and Hazel Ruby McQuain Chair for Neurological Research

Director of the WVU Neuroscience Graduate Program and recent recipient of the Award for Education in Neuroscience by the Society for Neuroscience. Dr. Nelson studies how disrupted circadian rhythms affect health and disease outcomes.



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Stroke
Addiction
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Human performance

Cognitive decline

Sensorv neuroscience

Circadian rhythms

and sleep



RNI IN THE NEWS **WVU neuroscientist** explores fighting weight gain with

The Associated Press. March 4, 2019

darkness



Candice Brown, PhD. **Assistant Professor** of Neuroscience Studies how sepsis and dementia interact on a cellular and molecular level, potentially making both diseases' symptoms more intense and their onset premature



PhD, John T. and June R. Chambers Chair of Oncology **Research**, Professor of Neuroscience Recipient of three current NIH R01 grants exploring the effects of social isolation on health outcomes ranging from

stroke to cancer

Students in the Department of Neuroscience at the West Virginia University School of Medicine are leading a campaign, "Feed Our Brains," to raise money to pay off overdue student lunch balances at schools in the greater Monongalia County area.

RNI IN THE NEWS

15 Gut Health Research **Breakthroughs** That Could Change Everything

Reader's Digest, May 2019

FACULTY HIGHLIGHTS



Vincent S. Setola, PhD. **Assistant Professor** of Neuroscience

Uses mouse models to better understand the genetics, brain regions, and molecular players involved in drug abuse



Bernard Schreurs. PhD, Professor of Neuroscience

Named the 2018-2019 Benedum Distinguished Scholar Award for his pathbreaking work in learning and memory; much of his work provides the foundational basis for understanding human memory problems including Alzheimer's disease

DEPARTMENT OF **EUROLOGY**

DEPARTMENTS

Broadening our impact with comprehensive care

Neurological care spans many disciplines. "If we can better manage pain through the combination of neurological care, psychological therapies, and neuromodulation techniques, we will have a positive impact in preventing the development of substance abuse problems," says David Watson, MD, department chair.

Headache program improves lives

Three Headache Medicine certified neurologists and two nurse practitioners offer thorough evaluation and diagnosis for people with complex headacherelated conditions. They also provide aggressive management, including nonpharmacologic and pharmacologic treatments, nerve blocks, chemodenervation, and various neuromodulation techniques, for debilitating conditions, including cluster headache and migraine. "Headaches co-exist with many other conditions-depression, post-traumatic stress disorder, addiction," says Dr. Watson. "Our efforts are focused on better understanding the unique drivers of headache disease, improving access to care, and finding new treatment options."

Expanding options for research and patient care

Other ongoing research includes investigations into neuromuscular conditions, stroke and cerebrovascular disease, epilepsy, and multiple sclerosis. Fellowships are expanding the team's ability to further train new neurologists, and new faculty in movement disorders, epilepsy, stroke, neurocritical care, and neuroimmunology are joining our team.

With a nationwide shortage of neurologists, "The question becomes, in addition to expanding our programs locally, how can we help people who have difficulties reaching us in Morgantown?" Dr. Watson asks. "We're determined to grow our services into underserved areas by recruiting more neurologists, expanding our telemedicine program, and developing more satellite clinics. In addition to serving West Virginians, our goal is that the RNI becomes a hub of excellence and a national center where people come to get the neurological care they need."



In a rural state, access to highly specialized care can be a challenge, and patients experiencing a neurological event can experience further suffering if not treated quickly. The Department of Neurology provides a lifesaving alternative through its telemedicine program, allowing patients to be evaluated without leaving their communities.



CERTIFICATION Comprehensive

Stroke Center

The WVU Stroke Center

The WVU Stroke Center is the only certified, comprehensive stroke center in West Virginia with advanced capabilities, 24/7 availability of specialized treatments, and staff with the unique education and competencies to care for complex stroke patients.

NEUROINTERVENTIONAL SERVICES

As part of the comprehensive stroke center, three neurointerventional radiologists provide round-the-clock, minimally invasive endovascular therapy for the treatment of stroke and other cerebrovascular disorders.

RNI IN THE NEWS

Neuromodulation as a Treatment for Migraine Umer Najib, MD, FAHS American Headache Society, April 2019

DEPARTMENT CHAIR

David Watson, MD, Director, WVU Headache Center

Chair of the Advocacy Engagement Subcommittee of the American Academy of Neurology and a native West Virginian











RNI IN THE NEWS

The WEB Device for Aneurysms

WV News, April 5, 2019

FACULTY HIGHLIGHTS



Umer Najib, MD, Assistant Professor and Program Director, Headache Medicine Fellowship Leads the development of the transcranial magnetic stimulation (TMS) program



Ann Marie Murray, MD, Assistant Professor and Neurology Student Clerkship Director Movement disorders specialist, West Virginia native, and delegate to American Medical Association



Muhammad Alvi, MD, Assistant Professor and Medical Director, WVU Stroke Program

Stroke neurologist who has worked extensively on understanding and preventing "silent strokes," which often go unnoticed; Develops collaborations across departments to deliver top-notch care to patients at the state's only comprehensive stroke center

SoHyun Boo, MD, Associate Stroke Director for **Endovascular Therapies**

Assistant professor and section chief for Radiology and Interventional Neuroradiology



DEPARTMENT OF NEUROSURGERY

Rapid expansion leading to exciting opportunities

Rapid growth in Neurosurgery is providing exciting possibilities for patients, according to Department Chair Mark Lee, MD, PhD, MBA. "We're creating multidisciplinary options in areas such as epilepsy, chronic pain, interventional neuroradiology, movement disorders, and degenerative conditions, including Alzheimer's disease," says Dr. Lee.

New approaches to patient care are bolstering the program's growth, as experts in neurovascular, epilepsy, neuromodulation, pediatric neuroscience, and complex surgical techniques are pioneering novel treatments. "For an increasing number of patients, we are the destination to help with difficult, chronic neurological conditions," says Dr. Lee.

Technology incubator catalyzes solutions

In 2019, the Department will launch a new technology incubator for trainees and researchers in partnership with the MBA program in the WVU John Chambers College of Business and Economics. "We will be instrumental in identifying patient issues and providing ideas, support, and resources to create solutions," says Dr. Lee.

Resulting device development and other enterprises will create intellectual property and commercialization

opportunities for the

Institute and state.

addiction May 8, 2019

Startups can generate more entrepreneurial research, educational options, and opportunities for commercial spinoffs.

Educational expansion for more specialized care

Over the past several years, additional residents and fellows have joined the expanding program. Specialty areas include: focused ultrasound, endovascular interventional neuroradiology, critical care and functional neurosurgery, neuromodulation, and a novel neurosurgery entrepreneur track. "Our trainees are a big part of our future, and we're working on tremendous opportunities for them," says Dr. Lee.

"There is enormous energy and vision here to support greatness and success. It feels like the very beginning of big things to come."

RNI IN THE NEWS

Doctors eye deep brain stimulation to treat opioid

The Associated Press,

FACULTY HIGHLIGHTS



The WVU Medic

Hospital and Birthir scheduled to open in 202⁻

> Robert Marsh, MD, PhD, Assistant Professor/ Section Chief, Neurotrauma Fits patients with cutting-edge artificial disks, allowing quick recovery from injury and increased flexibility



Cara L. Sedney, MD, MA, BC, FAANS, Assistant **Professor/Assistant Program Director** Specializes in spine surgery and completed her medical degree and orthopaedic spine surgery fellowship training at the WVU School of Medicine



Ansaar Rai, MD, Professor and Vice Chair, **Clinical Operations**

Specializes in endovascular neurosurgery for minimally invasive treatment of cerebrovascular disorders



Nicholas Brandmeir, MD, Assistant Professor Clinical research includes exploring the clinical impacts of postural instability on people with movement disorders

Becoming a **Destination Center**

The Pediatric Neurosurgery program provides state-of-the-art care for infants, children, and adolescents with problems of the brain and spine. Among the many conditions treated is epilepsy, for which there are many surgical options.

Dr. Mark Lee and his team are working toward making the program at the RNI a on center for pediatric epilepsy, providin West Vi but across the nation.

DEPARTMENT CHAIR

Mark Lee, MD, PhD, MBA

Joined the RNI from the Dell Seton Medical Center at The University of Texas, Austin, and previously served as the Allen Distinguished Chair in Neurosurgery at the Medical College of Georgia, Augusta

DEPARTMENTS

DEPARTMENT OF VIORA **PSYCHIATRY**

Expanding access, fostering hope

The RNI's Behavioral Medicine and Psychiatry team offers the full range of services from inpatient and outpatient programs, residential treatment, satellite clinics, and tele-psychiatry to patients across the lifespan from young children to elderly adults. In addition to direct patient care, it extends the reach of quality behavioral health treatment into rural communities using remote video-based consultation and mentorship to local providers.

Groundbreaking research conducted by the team includes harnessing the power of emerging technology to combat devastating brain disorders. Such research includes focused ultrasound, deep brain stimulation, and transcranial magnetic stimulation for opioid use disorder. The department is an active partner with public and private agencies and receives grant funding from the National Institutes of Health, the Substance Abuse and Mental Health Services Administration, the Health Resources and Services Administration, and the Patient-Centered Outcomes Research Institute.

A national model for addiction treatment and recovery

The team has been at the forefront of addressing the national addiction epidemic. In the early days of the opioid crisis, it developed the group-based Comprehensive Opioid Addiction Treatment

(COAT) program to provide the essential biological. psychological, and social elements of recovery treatment to thousands of patients. The COAT program has gained a national reputation of excellence, and

providers from across the country have come to Morgantown to see the team at work.

New fellowships, a dedicated team

In addition to treatment and research, the department has a vital role in training the next generation of behavioral healthcare providers. The team recently welcomed the first fellow in addiction medicine to its complement of 34 residents and fellows, whose specialties include general psychiatry, child and adolescent psychiatry, and forensic psychiatry, plus two psychology interns and three psychology fellows.

"We see many patients who are struggling mightily," says Dr. Berry. "But through the efforts of our institution's leadership, faculty and staff, and the people of our state, we have an opportunity to turn the tide on suffering. I'm confident we will."

COAT CLINIC

Since its establishment in 2004, the Comprehensive **Opioid Addiction Treatment** (COAT) clinic has treated nearly 4,000 patients. This nationally recognized model has trained four sites throughout the state, which in turn have trained 14 clinics

United Summit Center (USC) Pregnant and Postpartum Women's Program

Designed to help treat pregnant women with substance use and mental illnesses during pregnancy and postpartum, the USC Pregnant and Postpartum Women's Program offers a long-term substance abuse residential treatment facility. The program provides individualized treatment plans that include long-term recovery, a strong support system, and access to



Behavioral Health and Wellness and **Chief Behavioral Wellness Officer** Previously served at The Ohio State Wexner Medical Center as the Sinsabaugh Professor and Chair of the Department of Psychiatry

John Campo, MD,

Assistant Dean of



rights violations in

civil commitment

diagnosis and substance use in death penalty case appeals and constitutional and Behavioral Health



The new Center for Hope and Healing, which opened on March 1, offers world-class detox and treatment programs for people struggling with substance use disorder.

RNI IN THE NEWS

Addiction: **Discover how opioid** addiction affects the brain and how evidence-based treatments are saving lives

PBS NOVA, October 17, 2018

RNI IN THE NEWS

Rise in suicide rates in U.S. youth, especially girls

Reuters, May 21, 2019

FACULTY HIGHLIGHTS



Richard T. Gross, PhD, Associate Professor, **Psychology Section** Chief, and Clinical **Psychologist**

Dr. Gross has published work on opioid use in patients undergoing rehabilitation for chronic pain and the attendant risks



Laura Lander, MSW, Associate Professor, **Social Work Section** Chief, and Chair of the **Research Committee** Specializes in addiction and substance use disorders in pregnancy



DEPARTMENT INTERIM CHAIR

James H. Berry, DO, Director of Addiction Services

National addiction expert and recipient of the West Virginia Innovation Now Award in 2019 by Addiction Policy Forum

HUMAN PERFORMANCE CENTER

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Our team is committed to discovering, developing, and delivering world-class human performance research, technology, and tools to the scientific community and the populations we serve. We focus on improving readiness and optimizing performance and recovery with:

/ Active Duty Military / Executives / Elite Athletes / Veterans

The foundation for this work is based on a multifaceted, yet unifying framework that's driven by three recursive actions: **monitoring** drives **assessment** and sets the course for **improvement**.

MONITOR

We start by collecting a comprehensive set of validated data consisting of physiological, cognitive, performance, biomarkers, and subjective data generated in both laboratory and natural settings.



Scott Galster, PhD, Vice Chair and Director of Applied Neuroscience



Case Study

2016 Olympic Gold Medalist Ginny Thrasher worked with the RNI to monitor and assess her sleep, heart rate, and heart rate variability to see which improvements would benefit her performance.

The RNI is currently working with every branch of the US Military in research and technology development aimed at optimizing the performance, safety, recovery and health of

27,000+ SERVICE MEMBERS

ASSESS

Collected data is de-identified, secured, then standardized and indexed in the RNI Cloud. The team applies advanced data analytics to help predict outcomes for individuals and groups across populations.



Victor Finomore, PhD, Director of Research, Development, and Data Analytics

RNI Cloud



IMPROVE

Using advanced recovery research, the team is able to prescriptively apply modalities that build resiliency, enhance performance, and accelerate recovery both acutely and chronically through advanced recovery strategies.



Josh Hagen, PhD, Director of Human Performance Innovation Center



COLLABORATORS

RESEARCH AND INNOVATION ECOSYSTEM

The RNI ecosystem leverages the latest innovative technologies coupled with focused strategic partnerships with academia, government, and industry to rapidly accelerate discovery and patient care.



DEEP BRAIN STIMULATION (DBS)

The RNI is working with the National Institute of Drug Abuse (NIDA) and Medtronic in a research partnership investigating the use of DBS in the Nucleus Accumbens for severe, treatmentresistant opioid use disorder. This first-in-the-US study will examine the safety and feasibility of DBS in this population.

Working closely with the Laboratory of Cognitive Neuroscience at L'Ecole Polytechnique Federale de Lausanne (EPFL) in Switzerland, a systematic series of research projects are underway with intraoperative physiological recordings to further understand the neuroscience of consciousness.



VIRTUAL REALITY

The RNI's partnership with a neurotechnology company uses virtual reality technology in combination with neuromodulation to explore innovative treatment options for stroke, chronic pain, addiction, and cognitive decline.

"The RNI houses one of the most sophisticated integrated human performance laboratories in the world. Focusing on solving critical problems in neurological health and disease today, the RNI collaborates with hand-

selected partners to form a world-class innovation engine to create the field of brain health tomorrow."



Clay B. Marsh, MD Vice President and Executive Dean, WVU Health Sciences



FOCUSED ULTRASOUND (FUS)

In close collaboration with INSIGHTEC, the RNI is conducting cutting-edge FUS studies opening the blood-brain barrier in patients with Alzheimer's disease and glioblastoma tumors. Additional studies are underway using FUS as a neuromodulation tool for the treatment of opioid use disorder.

DATA ANALYTICS FOR POPULATION HEALTH

The RNI team has developed a robust infrastructure for large-scale longitudinal data acquisition across conditions such as addiction, chronic pain, and aging. The team's approach focuses on data streams from multiple sources, including wearable devices, mobile apps, biomarkers, imaging, and functional and clinical status. The RNI cloud links this data to a real time analytic platform using machine learning and predictive modeling to foster the development of personalized and innovative treatments. There are currently millions of data records residing in the RNI Cloud.

TRANSCRANIAL MAGNETIC STIMULATION (TMS)

fellows' training.

In partnership with MAGSTIM, the RNI is exploring the use of TMS combined with rehabilitation to improve motor and cognitive function. Specific projects are examining TMS and interactive gaming for addiction and Alzheimer's disease.



Laura F. Gibson, PhD Associate Dean for Research, WVU School of Medicine In addition to supporting an optimal research infrastructure to nurture innovative science across schools and institutes, Dr. Gibson's team oversees students and postdoctoral

and Education The RNI conducts cutting-edge clinicial trials to solve public health challenges and explore innovations in neuroscience and clinical care.



LEADERSHIP SPOTLIGHT

Marc Haut, PhD **Director, Clinical Research**



Sally Hodder, MD **Director, West Virginia Clinical** and Translational Science Institute (WVCTSI)

The WVCTSI recently received \$20 million in renewal NIH funding to build research infrastructure to improve health outcomes, good clinical practices, and regulatory compliance.

MILESTONES

Driven by an unwavering commitment to West Virginia, the RNI is forging new paths to better connect scientific research with patient care. Over the course of the year, the Institute's commitment has resulted in several firsts, from the launch of its new Innovation Center to several breakthroughs in neuroscience to hosting its first-ever Summit, which attracted more than 300 participants from across the globe. Senator John D. "Jay" Rockefeller IV joined the RNI team to dedicate the new RNI Innovation center in May 2019.

Grand Opening of the RNI Innovation Center

On May 15, 2019, the RNI was joined by nearly 300 attendees as it celebrated the opening of its new Innovation Center, a state-of-the-art facility featuring the latest technology for rapid translational human research. The event kicked off with a dedication ceremony, featuring remarks from Sen. John D. "Jay" Rockefeller IV and WVU President E. Gordon Gee, and was followed by a reception and tours of the Center.







RNI Pioneer Award

ROCKER

NEUROS

WVUMEDIC







"Our physicians and researchers at the Rockefeller Neuroscience Institute continue to produce amazing discoveries that will improve people's lives and change the trajectory of our State's health."

▼ E. Gordon Gee, President, West Virginia University



From top to bottom: Judi Polak and Ian Burkhart were each recognized with the RNI's "Pioneer Award." Pictured from left to right: Terre Burkhart (Ian's mother); Ian Burkhart; Ali Rezai, MD; Judi Polak; and Mark Polak, MD (Judi's husband). Partners Panel discusses improving population health and wellness. Miles O'Brien was the featured moderator. Attendees are welcomed to the Summit.

The RNI Inaugural Summit: Breaking Barriers

World-renowned experts from academia, healthcare, private sector, athletics, and government gathered in Morgantown May 15-17 to explore the latest breakthroughs in combating public health challenges, such as Alzheimer's disease and addiction, and optimizing brain health and performance during its Inaugural Summit, "Breaking Barriers." The event featured remarks from:

- Sen. John D. "Jay" Rockefeller IV
- Sam Quinones, bestselling author of DREAMLAND: The True Tale of America's Opiate Epidemic
- Miles O'Brien, PBS NewsHour science correspondent
- Tony Buettner, national spokesperson for Blue Zones
- NCAA coaches from various athletic programs

WVU Rockefeller Neuroscience Institute pioneers promising new alzheimer's therapy

On October 16, 2018, Judi Polak, a former WVU Medicine neonatal ICU nurse practitioner, became the first Alzheimer's patient in the world to undergo a Phase II study using focused ultrasound to open the blood-brain barrier in the hippocampus. A multidisciplinary team of over 30 specialists, in collaboration with INSIGHTEC, a global medical technology innovator, performed the procedure.

According to WVU Health System President and CEO Albert Wright, Jr., "In some ways, this was kind of like the team that put a man on the moon, and I'll always remember that moment."

As of May 2019, three patients with Alzheimer's have been treated with focused ultrasound at the RNI.

RNI IN THE NEWS

Battling **Alzheimer's** through Better **Access to the Brain**

Scientific American, November 2, 2018

RNI IN THE NEWS

Doctors perform promising new **Alzheimer's** therapy

NBC Fort Myers, November 5, 2018

RNI IN THE NEWS

RNI team named 'West Virginian of the Year'

NCWV Media, January 2019



WVU Rockefeller Neuroscience Institute surgeons perform minimally invasive surgery for epilepsy

In November 2018, surgeons at the WVU Rockefeller Neuroscience Institute performed the state's first laser interstitial thermal therapy (LiTT) procedure for drug-resistant epilepsy caused by focal seizures.

"LiTT has the ability to make areas of the brain accessible that previously were not and to provide patients with minimally invasive options that would not exist otherwise," Nicholas Brandmeir, MD, WVU Medicine neurosurgeon, said. "This technology allows us to start moving past the era of open brain surgery for epilepsy and other conditions and toward a future of minimally invasive, outpatient options."

WVU Rockefeller Neuroscience Institute now offering new, non-invasive treatment for movement disorders

The RNI performed its first MR-guided focused ultrasound procedure for essential tremor on June 18, making it the only site in West Virginia and just one of 15 sites in the US utilizing this new, FDA-approved treatment. The first patient was a 71-year-old male who had complete resolution of his tremor immediately following the procedure.



Clinical trial for chronic pain launched utilizing non-opioid micropellet implant

The RNI marked a major milestone in November 2018 by enrolling the first patient in a randomized clinical trial testing the effectiveness of an injectable nonopioid, non-steroid micropellet to treat sciatica. The clonidine micropellet, which is half the size of a grain of rice, is placed in a patient's lower back for extended release of drug-delivery to combat chronic sciatica pain.







Can West Virginia Solve America's Healthcare Problems?

RNI IN THE NEWS

Fortune, March 20, 2018

RNI IN THE NEWS



Becker's Hospital Review, November 2018



Neurointerventional services

In keeping with its tradition of being innovative and a leader in the field. the WVU Neurointerventional and Neurovascular program became one of the first sites in the country to use a new cerebral aneurysm treatment implant called the WEB for Woven Endobridge device. WVU Medicine was also part of a pivotal trial completed two years ago and is leading in the number of cases treated. WVU faculty serve as proctors and are training other physicians across the country to use this new technology.



TEDxWVU: Breaking Barriers In Neuroscience

Dr. Rezai for TedxWVU. March 2, 2019

RNI IN THE NEWS

Pellet Carrying **Blood Pressure Medication Offers New Hope for Sciatica Patients**

CBS New York. February 21, 2019

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