Brain Health Research Reveals Timing of Brain Oxygen Delivery Is Vital to Health Cognition

Ka Cotter to Lead Center for BrainHealth Advisory Board

Expert Insights from The Brain: An Owner’s Guide Lecture Series Speakers

INSIDE THIS EDITION OF BRAINMATTERS

- BrainHealth Research Reveals Timing of Brain Oxygen Delivery Is Vital to Health Cognition
- Ka Cotter to Lead Center for BrainHealth Advisory Board
- Expert Insights from The Brain: An Owner’s Guide Lecture Series Speakers

Coming Up at the Center for BrainHealth®

APRIL 12
Sips and Science
The Power of Observation
6:30 PM RECEPTION, 7 PM LECTURE
Bonnie Pitman
Director of Art-Brain Innovations
centerforbrainhealth.org/calendar

MAY 3
Sips and Science
The Science of Emotional Intelligence
6:30 PM RECEPTION, 7 PM LECTURE
Bill Benjamin

MAY 3
Reprogramming the Brain to Health Symposium
Measuring Brain Health
7:30 AM TO 5 PM
In partnership with the Helen Wills Neuroscience Institute at U.C. Berkeley
For cognitive scientists, neuroscientists, physicians, psychologists, rehabilitation specialists, researchers, educators and students.
centerforbrainhealth.org/research-symposium-2018

MAY 5
RSVP for the TAG Derby Party
Young Professionals Supporting BrainHealth
May 5th, 10 AM to 3 PM
DALLAS ARBORETUM
2018 funds support a cognitive training collaboration with the Dallas Police Department.
centerforbrainhealth.org/tag

MAY 19
Highland Capital Warrior and First Responder Reunion Celebration
Flour Corporation Lecture
6:30 PM RECEPTION, 7 PM LECTURE
John Tioghen
Co-author of 13 Hours: The Inside Account of What Really Happened in Benghazi
centerforbrainhealth.org/calendar

JUNE 11 TO 22
Register Now for Summer Camp
Teen SMART Camp
9:30 AM TO 2:30 PM, MONDAYS THROUGH FRIDAYS
For students entering grades 6 to 11.
centerforbrainhealth.org/programs

Donor Profiles:
Bea Wallace
Capital for Kids
The Folsom Family
Moozie Foundation
Kim Hiett Jordan
Garry Allen Weber

Where ‘Self’ Lives in the Brain

Dr. Vince Calhoun: The Jane and Bud Smith Chair

Center for BrainHealth’s Brain Matters Newsletter

Q1 2018
Mrs. Cotter played a pivotal role in growing the Staubach Company from a one-office real estate firm in Dallas to a global real estate advisory company that was acquired by Jones Lang LaSalle in 2008. Now she advises high-growth companies, small businesses and community leadership.

In addition to her four years on the Center for BrainHealth advisory board, she also serves on the boards of the Perot Museum, Aword.org and WINGS for Women (formerly YWCA).

“Mrs. Cotter is an impressive organization that is well on its way to changing the way people think about and care for their brains,” said Ka Cotter. “It is my pleasure to be able to help leverage our board to expand the reach of this noble cause.”

As the new advisory board chair, Mrs. Cotter is charged with energizing the Center’s 90-member board. Comprising some of the city’s most active philanthropists and community leaders, the Center welcomes recent board members including Stacey and Dan Branch, Amy Burgher, Susan Garcia, Brill Garrett, Marena and Roger Gault, Heather Gilker, Elizabeth Hughes, Dr. Eric Klidebeck, Shirley and Bill McIntyre, Keana Meyer, Amanda and Anson Reilly, Phil Ritter and Bob White.

Mrs. Francis, Mrs. Cotter’s predecessor, served as chair for more than 15 years. Expressing her high esteem and support for Mrs. Cotter, as well as her continued commitment to the cause of brain health, Mrs. Francis said, “One: you are in highly, HIGHLY capable hands, and two: I am not going anywhere.”

Mrs. Francis will remain on the board but will turn her focus to fundraising for Center for BrainHealth’s newest initiative, BrainHealth 2027 – a global effort to double brain performance in the next 10 years. Fellow advisory board member Patty Huffines is co-leading that effort.

The executive conference room at the Brain Performance Institute™ has been named in honor of Debbie Francis and her tenure as advisory board chair.

Mrs. Cotter will be the Center’s third advisory chair. Prior to Mrs. Francis, founding chair Shelia Schlosberg was the first to grace the leadership role in 1999.

Fellow advisory board member Patty Huffines, Mrs. Francis’ successor, will officially take the reins as Center for BrainHealth advisory board chair on April 1. Center for BrainHealth founder and chief director Dr. Sandra Bond Chapman, and current advisory board chair Debbie Francis, made the announcement in February at the advisory board meeting.

“One: you are in highly, HIGHLY capable hands, and two: I am not going anywhere.”

Welcome Our New Board Members

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Amy Burgher
Susan Garcia
Brill Garrett
Marena and Roger Gault
Heather Gilker
Elizabeth Hughes
Dr. Eric Klidebeck
Shirley and Bill McIntyre
Keana Meyer
Amanda and Anson Reilly
Phil Ritter
Bob White

For a list of current advisory board members, visit centerforbrainhealth.org/advisory-board

AL HILL, JR.
In Memoriam

Boundless curiosity and compassion for others informed the life of Al Hill, Jr. A proud Texan, oilman, developer and top-flight amateur tennis player, Mr. Hill enthusiastically shared his broad range of interests, and his love of knowledge, by generously giving his time and resources.

“Al was particularly interested in brain plasticity and would often send us articles – he had a very inquisitive mind,” said Dr. Sandra Bond Chapman, chief director, Center for BrainHealth.

In addition to notes and articles, Mr. Hill sent books. A favorite, The Miracle of Stem Cells, is considered a classic in the field. It illustrates both his interest in gene therapy and his relentless pursuit of ideas, insights and innovation.

An early advocate of brain health, Mr. Hill was a long-time supporter of the Center, contributing to various research and capital projects, including the Brain Performance Institute.

The oldest grandson of legendary Texas oilman H. L. Hunt, Mr. Hill lives on through his family’s philanthropy. His daughter Heather Washburne and her husband Ray, along with Mr. Hill’s sister Lyda Hill, share his passion for brain health and continue to support the Center for BrainHealth generously.

Mr. Hill is also survived by daughter Elisa Summers, sister Alinda Wikert, and nine grandchildren.

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Supports Brain Performance Across the Lifespan

BrainHealth supporter. “The brain has skills that are still unknown to us.”

At a dinner almost 20 years ago, Beatrice “Bea” and Ray Wallace met Dr. Sandra Bond Chapman. Sometimes before dessert, Dr. Chapman shared with them her vision for advancing brain health.

As Ms. Wallace remembers, it was an ambitious plan. “I was so intrigued that she would take on such a big health care issue. That she would be exploring brain health, a part of the body that had been overlooked for years, was intriguing to me,” said Ms. Wallace.

Inspired by the pioneering research and new technologies aimed at advancing the science, Ms. Wallace says brain health is one of the last frontiers in medicine. “It’s a fascinating area and one that deserves support,” said Ms. Wallace.

Through the years, Bea Wallace and her late husband Ray joined other private donors to help turn Dr. Chapman’s vision into a reality. As their friendship developed into partnership, the Wallaces’ philanthropy has become concrete – and glass.

“The subject of a 2008 book entitled A Renaissance Woman, Ms. Wallace grew up on an Oklahoma ranch during the Great Depression, and later attended the University of Oklahoma. Among her many accomplishments, she was the first woman to chair the National Fish and Wildlife Foundation, and the first woman to serve on the Texas Parks and Wildlife Commission.

Today, Ms. Wallace is still ranching and actively supporting a variety of artistic and scientific efforts, including the advancement of brain health. Referring to the rapid growth of research initiatives at the Center for Brain Health, she commented, ‘I’m so glad we went to that dinner years ago.’

Bea and Ray Wallace

The stock market provided its share of excitement in the first quarter of 2018, but Garry Weber, the CEO of Weber Financial Inc., has seen it all before. With decades of experience in the financial services industry, the former Dallas County judge, who also served on the Dallas City Council, has a long history of investing his time and money in community service and philanthropic efforts.

As part of his advocacy for brain health awareness, Garry Weber has participated in a BrainHealth® Physical, a unique assessment that provides a benchmark of cognitive performance and promotes personalized recommendations to enhance brain performance.

“I’m not retired, and still very active in investments. You gotta be sharp in this business,” he explained.

Judge Weber also nurtures his brain health through spending time outdoors when the markets are closed. He has a commitment to wildlife that he lives out, in part, through board commitments to the Whale Trust Advisory and National Geographic Society.

“I’m impressed with the work and how much attention brain research seems to be getting in a short period,” said Judge Weber. “I’ve talked to many people about the importance of brain health and how it’s often a neglected part of overall health and wellness.”

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KATHRYN (KIM) HIETT JORDAN

Supports Brain Performance Across the Lifespan

I feel the brain has more to do with our lives than we understand,” explained Kim Hiett Jordan, Dallas philanthropist and long-standing Center for BrainHealth supporter. “The brain has skills that are still unknown to us.”

Ms. Jordan is a proponent of creative and intellectual exchange, faithfully supporting the arts and education. Her deep commitment to empowering the community and its members is evident; for example, she has endowed the nation’s largest annual prize that supports emerging leaders in the humanities. At the Brain Performance Institute, her generosity has helped hundreds of military veterans and active-duty service members participate in the Center’s science-based cognitive training – at no cost to them.

“I feel for those with invisible wounds of war,” said Ms. Jordan. “I was floored when I learned about the suicide rate of our warriors. I wish everybody understood what our warriors go through.”

Thanks to her generosity and the philanthropic support of many other individuals and foundations, more than 3,100 veterans, military spouses and first responders have learned new tactics to better manage tasks, focus their attention and think creatively – a practice that has been shown to help decrease symptoms of depression, anxiety and stress.
Scientists recently conducted a review of literature positing a new way to quantify the “self.” Published in Trends in Neuroscience, the article is a departure from the self-introspection and personal narration typical of Freud. Their focus was on quantifying the self through neural activity in the brain. The review—co-authored by Dr. Xiaosi Gu, head of the Computational Psychiatry Unit at the Center for BrainHealth, and Dr. Jie Sui of the University of Bath—highlights study findings related to changes in brain activation that occur when situations affect a person’s own self and self-interest versus another person’s self and his or her self-interests.

“There are many unanswered questions when it comes to quantifying how the brain computes ‘self,’” said Dr. Gu. “Better understanding this could lead to breakthroughs in psychiatric disorders that involve aberrant self-processing such as anorexia nervosa, schizophrenia, autism spectrum disorder, major depression, and borderline personality disorder.”

Citing studies that used quantitative measures of the self vs. others, a simple example looked at the differences in processing speed. When shown information related to strangers, friends and themselves, participants were able to process information and make decisions much more quickly when it related to themselves instead of others.

Drs. Gu and Sui also cited studies in which areas of the brain associated with decision-making acted very differently in a mock investment situation depending on who and how much was at risk.

Depending on whether the person was making his or her own investment or watching someone making their investments, researchers observed differences in the anterior cingulate cortex. Activity in another region of the brain, the insula cortex, correlated with the amount of the investment. For people with borderline personality disorder, insula activity was flat compared to typical individuals when observing the other, but normal in the self-case. The opposite was true for people on the autism spectrum in the study. They showed normal activity in the other case and diminished activity in the self-case.

Drs. Gu and Sui concluded, “Thus, the paradigms and models reviewed here could potentially provide valuable insights into the mechanisms of mental illness.”
Autism Intervention Study Shows Brain and Social Change

Pilot study findings published in Autism Research from Center for BrainHealth, in collaboration with co-leading authors at George Washington University and Yale, have demonstrated that a clinician-driven virtual learning platform, tailored to young adults on the autism spectrum, improved social competency. Findings reveal that increases in socio-emotional and socio-cognitive abilities correlate with brain change. Results included increased activation in the brain’s socio-cognition hub with gains linked to improvement on an empathy measure.

The present findings are among the first to demonstrate neural changes that are associated with significant behavioral gains in young adults with high-functioning autism.

The social cognition virtual reality training, now available under the name Charisma™ through the Center for BrainHealth’s Brain Performance Institute, demonstrated that study participants with autism shifted their attention from non-social information – a behavior commonly displayed in autism – to social information, a skill that is meaningful to social exchanges.

“Brain change is a big deal in adults with autism. Many people implicitly believe that brain changes are unlikely for adults with autism, which might affect how they interact with those adults. This study challenges that very notion and has profound implications in the way people would view, interact and treat adults with autism,” said Daniel Yang, PhD, assistant research professor at George Washington University.

BrainHealth® Research Reveals Timing of Brain Oxygen Delivery Is Vital to Healthy Cognition

The Center for BrainHealth at The University of Texas at Dallas announced the results of a new study investigating how brain activity and brain blood flow work together to help us think quickly and efficiently. Study results appearing online ahead of publication for NeuroImage indicate that intact communication between brain cells and blood vessels forms the basis for fast, efficient cognition in young, healthy adults.

Researchers believe declines in this brain cell and blood vessel communication system might explain the reductions in cognitive speed seen in aging and disease.

Led by Dr. Bart Rypma, associate professor at UT Dallas, the research team approached the problem of cognitive decline through the lens of multiple sclerosis. Thirty to 70 percent of MS patients report slowed cognition. While prior research has focused on myelin – part of the brain’s white matter that protects neurons, speeds communications and is known to be damaged in MS – Rypma’s team focused on glia.

Glia are also known to be damaged in MS. They are a type of cell that acts as a kind of middleman, allowing myelin to communicate with blood vessels when they need oxygen. When glia are damaged, they can neither effectively relay the needs of brain cells to blood vessels nor can they help transport oxygen and nutrients from blood vessels to brain cells.

Using functional MRI, the team measured the brain blood flow response over time, noticing the wave shape it created. Results show that, compared to healthy individuals, delays in the time it took for the brain blood-flow response to reach its peak are correlated with how much MS-related cognitive slowing occurred.

“Our research shows that MS-related damage is not limited to lesioned regions of the brain, and instead represents widespread dysfunction,” explained first author Monroe P. Turner, doctoral student at the Center for BrainHealth. “We hope that by elucidating the mechanisms of glia and their differences in disease states such as MS, we can help further knowledge of not only the MS brain, but the healthy brain as well.”

This study was supported by the Dianne Cash Predoctoral Fellowship, the Friends of BrainHealth and the Linda and Joel Roebuck Distinguished New Scientist endowments, the National Multiple Sclerosis Society, and the National Institutes of Health.

New Funding for Multiple Sclerosis Pilot Study

Dinesh Keran Sivakolundu, MD, a doctoral student in Dr. Bart Rypma’s NeuroPsychometric Research Lab at the Center for BrainHealth, was awarded $44,000 in pilot funding from the National Multiple Sclerosis Society.

The research team will use novel methods that use caffeine to study the support cells in the brain of MS patients. To the team’s knowledge, this is the first time a study will be looking into the functioning of these support cells and how its dysfunction could lead to MS-related cognitive impairment. In addition, they will also be employing a novel imaging method, which will help researchers understand blood flow to the specific regions of the brain and nerve cell metabolism. Findings could have major implications for the development of MS biomarkers and treatment strategies for MS-related cognitive dysfunction.

This study identified three significant brain-behavior changes:

**THEORY OF MIND**
Theory of mind, or the ability to realize the intention of others, is often lacking in individuals with autism. After the intervention, the part of the brain associated with socio-cognitive processing showed an increased activation of social stimuli compared to non-social stimuli.

**SOCIAL-EMOTIONAL PROCESSING**
The brain area responsible for socio-emotional processing showed individual gains in emotion recognition, with decreased activation to social versus non-social stimuli. Thus, those that showed increased recognition of emotions paid more attention to social stimuli than non-social stimuli.

**ATTENTION TO SOCIAL STIMULI**
The part of the brain for visual attention showed significantly decreased activation to non-social versus social stimuli across all participants.
I was so impressed with the brain health classes, and soon after my father was diagnosed with Alzheimer’s disease, I heard Dr. Chapman speak and decided to take my dad to the Center,” said Diane Folsom Frank. “Since then, my brother, sister and I have been extremely involved.”

The legacy of businessman and former Dallas Mayor Robert Folsom continues today through his family’s generous commitment to the community, and to a very personal cause.

“Soon after my father was diagnosed with Alzheimer’s disease, I heard Dr. Chapman speak and decided to take my dad to the Center,” said Diane Folsom Frank. “Since then, my brother, sister and I have been extremely involved.”

The family’s support includes a capital gift, funding a training room at the new Brain Performance Institute. It is a space in which brain health can touch the community through the Discovery Group — a program for people recently diagnosed with dementia and support for family members, friends and caregivers.

“I was so impressed with the brain health classes, and what they’re doing for our service members. It’s important to work for both individual health and the health of our country,” said Ms. Frank. “Learning what’s going on makes you even more willing to help.” She says her family is optimistic the work at the Center will add substantially to knowledge and advancement of brain health.

Speaking on behalf of her siblings, Debbie Jarma and Steve Folsom, Ms. Frank talked about the relationship between donors and the science they support. “There is a genuine excitement in partnering in an area of science that constantly produces new insights,” she said. “Then getting to see the application of the research in training and healing is wonderful.”

Hoping that someday no family will have to face the pain and challenges associated with watching a loved one struggle with Alzheimer’s disease, the family remains committed to furthering their father’s generous legacy. “We love the Center and will continue to support it,” Ms. Frank said. “It’s so important to us.”

The whimsically named Moozie Foundation is having a serious impact on the advancement of brain health. As one of several foundations associated with the Caroline Rose Hunt family, this foundation is Mrs. Hunt’s way of inspiring the next generation of students.

“We are honored that the Moozie Foundation chose to champion veterans and military service members through brain performance-building programs at the Center for BrainHealth,” explained Leanne Young, Brain Performance Institute’s executive director.

A window-walled training room, named in honor of the Moozie Foundation, now welcomes members of the community and, particularly, military, law enforcement, and first responders, who are there to learn tactics and brain strategies to enhance decision-making and reduce stress-related symptoms.

“The trustees were looking to place a significant gift aligned with our mission,” said Lynn Mahurin, vice president of the Moozie Foundation, who oversees charitable giving. “Assisting people to achieve self-sufficiency is at the core of our funding efforts.”

Caroline Rose Hunt has been a steady supporter of the Center for BrainHealth for many years, through her generosity and other private donations, there is no cost to warrior training participants.

About that name — “Moozie” is the endearing name her 19 grandchildren call her, and the Brain Performance Institute is proud to be a recipient of one of its first donations.

For the past two years, the Center for BrainHealth has benefited from the organization’s break-the-cycle funding, aimed at education and counseling for children in underserved areas.

Executive committee member Dawn Blankenship Hennessy says partnering with the Center for BrainHealth aligns with Capital for Kids’ mission of supporting student achievement. “Training teachers to educate children in a stronger, better way of learning is critical to the students’ chances of success,” said Ms. Hennessy.

Through grants from Capital for Kids, clinicians at the Center for BrainHealth are training middle school teachers to help students with abstract reasoning and deeper-level thinking skills. Support from Capital for Kids is allowing the Center for BrainHealth to expand its MSBY (middle school brain years) program to Dallas schools that are part of Mayor Mike Rawlings’ Grow South initiative, a drive to create more opportunity in the city’s southern section. MSBY has been shown to approximately double commended scores on reading, math, science and social studies.

“Here at the Center, the impact on the advancement of brain health is evident in our students’ test scores. The capital comes from financial industry volunteers who raise money to provide grants to community programs.”

At last year’s Brain Matters Gala, the Moozie Foundation was awarded the Moozie Leadership Award in honor of the Moozie Foundation, who oversees charitable giving. “Assisting people to achieve self-sufficiency is at the core of our funding efforts.”

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Capital for Kids was founded in 2005, raising over $300,000 in its first year. Since then, it has raised $14 million in support of over 100 different organizations. With overhead costs provided by volunteer board members, 100 percent of the dollars raised go directly to support children and students throughout DFW.
Teenagers report at least sometimes doing homework while using another medium, including TV, social media, texting and listening to music. This can negatively affect academic performance and learning. Parents can model positive behavior by eliminating charging stations from bedrooms and limiting technology use during family time and when engaging in activities that require deeper-level thinking.

Getting enough sleep helps your brain problem-solve and process information. If you oversleep on the weekends, if family and friends tell you that you are irritable, if you lack empathy – you are not getting enough sleep. Getting daylight exposure right can help.

Tips for better sleep: If you are a night owl – try and get as much morning light exposure outside as possible – this will advance your body clock and help you get up earlier. However, early risers can benefit from early evening light exposure, which will move the body clock later and help you wake later.

After an Alzheimer’s or dementia diagnosis, it may be tempting, as a caregiver, to remove all decision-making responsibilities from your loved one and limit their interaction with the world. But research shows that it is important to find safe ways to keep them involved and engaged with their lives. Maintaining independence and a feeling of relevance is important to stave off further cognitive decline.

Happiness is defined as the joy you feel as you work toward your potential. It is not a constant smile on your face and overly optimistic outlook. If we sugarcoat the present, we don’t make strides in the future.
The Center for BrainHealth has secured Dr. Vince Calhoun, one of the nation's top brain imaging experts, as the Jane and Henry J. (Bud) Smith chair at the Center for BrainHealth.

Dr. Calhoun's research focuses on novel ways to analyze brain-imaging data and extract meaning from it. Using fMRI data, Dr. Calhoun visualizes how different brain regions talk to one another — producing maps of the brain's functional connectivity.

Deputy director of the Center for BrainHealth, Dr. Daniel Krawczyk calls Dr. Calhoun's work in brain imaging game-changing, “Dr. Calhoun is a world leader in developing new data-analytic techniques for neuroimaging data. He has elegantly applied these techniques toward gaining a better understanding of neurological and psychiatric conditions. We are excited to work with Dr. Calhoun to better define and understand markers of brain health.”

“Dr. Calhoun's research is groundbreaking. Thanks to the support of the Smiths and other philanthropists, we are able to make major advances in understanding the brain,” Dr. Calhoun said.

Dr. Calhoun explained, "The brain is very dynamic, so connectivity patterns need to reflect that. We’re developing tools that will capture the ebb and flow of brain activity throughout a set period of time, so-called dynamic connectivity."

Advancements in brain imaging, in particular, dynamic connectivity, provide a deeper understanding of neurological diseases such as schizophrenia and Alzheimer's, allowing for faster and more accurate diagnosis.

Being a part of new discoveries is what inspired Jane and Bud Smith to get involved with brain health research over a decade ago.

"Jane and Bud are essential because they enable you to push forward in directions that are exciting and visionary. Support like theirs is really jump-starting big ideas that can change the field — areas you may not be able to get grant funding for," Dr. Calhoun said regarding the importance of private philanthropy partners to advancing science.

"A lot of people are interested in the brain now, but we didn't see that back then," said Mrs. Smith. "If you believe in something, and they need help to get it going, then anything you can do financially, like establishing a chair, enables the ideas to be developed."

The Smith chair at the Center for BrainHealth was endowed in 2005. Since then, it has funded many areas of science: from the treatment of military veterans to welcoming people who are taking charge of their brain health at the new Brain Performance Institute to techniques for imaging and analyzing brain functionality.

In recognition of their ongoing support, the Smiths were honored in 2013 with the Center for BrainHealth’s highest tribute, the Legacy Award, and when the Brain Performance Institute opened its doors, the building’s Grand Hall was named in their honor.

Despite advances in brain imaging over the past decade, Dr. Calhoun says, "The brain is still very much a mystery; little is known about how it works. While the science is advancing in various research centers, one of the primary barriers is the lack of technological infrastructure needed to share and analyze data already in the research pipeline."

Dr. Calhoun and the Center for BrainHealth want to help overcome the lack of data-sharing infrastructure and are part of a new consortium that will share and analyze the computerized data of brain imaging research around the world through a shared database. This will help to advance the science and understanding of the brain.