



healthy minds,
healthy world



In the United States, **1** out of every **5** Medicare dollars goes to treating Alzheimer's disease. The Center for Healthy Minds is launching new research to look at the emotional underpinnings of the disease in the brain.

“ We live in the most technologically connected age in the history of civilization, yet rates of loneliness have **doubled** since the 1980s...

Loneliness and weak social connections are associated with a reduction in lifespan similar to that caused by smoking 15 cigarettes a day and even greater than that associated with obesity.”
— Former U.S. Surgeon General Vivek Murthy



Globally, more than **300 million** people are affected by depression. In lower income countries, more than **75%** of people with mental disorders receive no treatment compared to **50%** in higher income countries like the United States.



Meditation may **decrease** the risk of heart disease, according to a first-ever statement on the practice issued by the American Heart Association, with contributions from Center founder and director Richard Davidson.



THE RELATIONSHIP BETWEEN emotions and alzheimer's

When Will Clifton went on a road trip out West with his elderly parents five years ago, he quickly realized something was amiss.

“My mother has always been the keeper of directions, but when I handed her the map, she couldn't read it,” Clifton says. “I said to myself ‘She's not tracking this.’ We couldn't tell where we were on the map or where we were going. And then her questions got repetitious.”

Clifton learned his parents had not shared with him his mother's recent diagnosis of Alzheimer's disease. He was heartbroken to learn on the same trip that his father was also experiencing confusion and memory issues.

“I then gave the map to my father, and he thought we were on the wrong side of the Rockies and could also not track things,” he says.

Stories like Clifton's where a loved one has Alzheimer's are unfortunately becoming more commonplace, with the disease becoming one of the top public health crises in the United States and the sixth cause of death. This irreversible, accelerating brain disorder not only impairs memory and thinking, but it can also create emotional hurdles.

Yet such emotional challenges may hold clues for better treatment and prevention — a reality that has inspired Center for Healthy Minds researchers to collaborate with the Wisconsin Registry for Alzheimer's Prevention (WRAP) for a two-year study to examine how emotion may play a role in the development of the disease.

“We're hoping to learn whether people's typical emotional responses seem to be linked to developing Alzheimer's,” says Stacey Schaefer, associate scientist at the Center who leads the research. “The goal is to reveal predictors of Alzheimer's and how we may be able to better develop and target interventions and therapies to help.”

The project, funded by the National Institute on Aging and National Institute of Mental Health, will examine how emotional processes may go awry during early stages of the disease. High rates of depression, anxiety, agitation, irritation and mood swings are frequently reported in patients, and the same networks responsible for emotion in the brain are those that are affected by the disease. Though people with depression have a greater risk of developing Alzheimer's disease, there are many unanswered questions whether emotional responses may be linked to the intensity and timing of the disease, and if one predicts the other.

The team will work with participants between 50 and 85 years of age who have previously participated in multiple WRAP lab visits, where scientists have collected brain imaging data, blood samples, spinal fluid and cognitive measures. Most of these participants have a parent who suffered from Alzheimer's disease.

In addition, Center researchers will measure people's emotional responses to stimuli in the lab — like images of cute animals and children, people in love, accident and war victims, appetizing food, etc. — by measuring their facial muscle and brain responses. The team will also look at how these measures of emotional responses relate to memory and cognition changes, and brain data tracking tau and amyloid levels — the tangled and damaged neurons in the brain that are left in the wake of the disease.

“We want to know whether there are signs earlier in the development of the disease or if there are different emotional styles that might increase the vulnerability to Alzheimer's,” says Schaefer. “This disease's numbers are astounding. Our health care systems can't take care of it. Our hope is to find new information to delay, prevent and take care of people who have it in a much more humane way by understanding their emotional problems.”



your “second brain” and well-being

Melissa Rosenkranz, an associate scientist at the Center, studies how the brain and body communicate. Building on previous work examining how stress increases inflammation in the body, Rosenkranz is studying the role of microscopic bacteria, fungi and viruses — called the “microbiome” — in our physical and mental health.

What is the microbiome and why is it important?

The microbiome refers to communities of microbial cells like bacteria, fungi and viruses that inhabit a specific area — in this case, the human body. Our bodies are teeming with microbes that play a crucial role in everything from our immune responses to digestion and mood. Everyone's microbial signature is different, and what we want to know is whether the composition and diversity of the microbiome affects our well-being. These microbial communities are referred to as your “second brain” because, like the brain, they can interpret information and send signals that direct biological processes in the body.



How are you studying the microbiome in your research?

We've studied people with asthma and discovered that the microbiome in the lungs of people who are chronically stressed is different from people with asthma who do not have chronic stress. Our hypothesis is that the makeup of a person's microbiome may influence the brain's response to stress. We've found that people with high levels of chronic stress seem to have less diversity in their lung microbiome, meaning it may be more vulnerable to be taken over by one or two species. And if a virus comes along that one population is susceptible to, it can wipe out that species, increasing the chances that person will get sick.

For people with asthma and chronic stress, we suspect their microbiome communities to play a role in communicating with the brain and impacting inflammation. We don't know which influences the other, but there seems to be a link.

What effects could this research have for other diseases?

The scientific community is only beginning to understand the importance of a healthy microbiome in different areas in the body, but there's reason to believe it may complement traditional means of managing chronic disease.

WELL AT WORK

Healthy Minds Innovations, an external non-profit affiliated with the Center for Healthy Minds, is launching pilots in companies in Wisconsin and other parts of the country for its new program, Healthy Minds @ Work. The idea is to share well-being practices with the world while collecting data to learn more about the science of a healthy mind.



SAY "CHEESE"

With the Greater Good Science Center and the Templeton Foundation, Center experts offered a photography program for cultivating mindfulness and gratitude in 5th-grade classrooms participating in Center research. Both teachers and students reported enjoying the curriculum, and found it engaging and meaningful.



RE-IMAGINING HUMAN FLOURISHING WITH THE DALAI LAMA

Richard Davidson joined His Holiness the Dalai Lama for the Mind & Life Dialogues this March in Dharamsala, India. Davidson and other experts shared the latest science about child development and the importance of instilling kindness and other prosocial behaviors early and often.

THE PURSUIT OF HAPPINESS

"One of the most powerful ways to promote happiness is to be good. There is a substantial body of research that shows that is true. For example, if we bring people into the laboratory in the morning, and give them \$100 and say, 'You can take this money and buy whatever you'd like for \$100. The constraint is you can only buy stuff for yourself.' The other group is given the same \$100, and the constraint is you can't spend a penny on yourself. At the end of the day, guess which group reports tremendously increased happiness? It suggests that being good and being happy are highly correlated."

— Richard Davidson

Watch the full event, "The Pursuit of Happiness," with Davidson and Wisconsin Public Radio's Anne Strainchamps at this link: bit.ly/2q70Z4D

honoring your lifetime commitment to creating a better world

"Given behaviors we see in society today, there's a lot of good that could be accomplished if the principles of well-being and mindfulness were taught on a larger scale. It could make a difference in how society functions and how the world functions. Toward that end, our legacy gift to the Center for Healthy Minds supports this vision, and we hope to inspire others to think about their legacy along the same lines."

— Stefanie Mortz and Vince Jenkins

Please consider the Center for Healthy Minds in your estate plans by leaving the Center a portion of your estate in your will, or by designating the Center as a beneficiary of your retirement account or life insurance policy.

To learn more, please contact our Director of Donor Engagement, Lorri Houston, at LHouston2@wisc.edu or 608-263-3672. Thank you for ensuring your legacy continues for generations to come.

