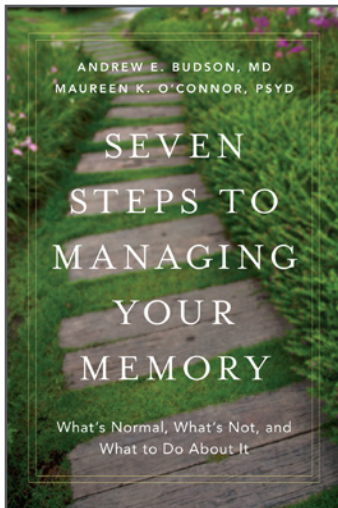


Seven Steps to Managing Your Memory

What's Normal, What's Not, and What to Do About it



DO YOU ever wonder whether your memory is normal or not? Is it OK to have difficulty recalling a name or spending ten minutes looking for your car in a parking lot? How do you know when a slip of memory is a normal part of getting older versus the start of Alzheimer's disease? When should you bring your memory concerns to the attention of your doctor? Drs. Andrew Budson and Maureen O'Connor, Director and Associate Director of the BU ADC Outreach, Recruitment, & Education Core, tackle these and other issues in their new book, *Seven Steps to Managing Your Memory: What's Normal, What's Not, and What to Do About It*. They began writing the book when they realized that most people don't know which memory problems are part of normal aging and which are likely due to a brain disease like Alzheimer's.

"Most people think that if their memory is as good as their neighbor's, then it must be OK. The issue is that memory difficulties are so common, it may be that both you and your neighbor are having serious memory problems and don't realize it," Budson explained. "In the last ten years, there has been an explosion in our knowledge of what causes memory loss and how best to diagnose and treat it. We also know much more about how to keep one's memory strong."

"We've been teaching memory strategies to elders in our groups for more than ten years," O'Connor said. "This book is our opportunity to share those strategies with a wider audience."

One interesting aspect of the book is that there are stories woven throughout it. "We included these stories to illustrate many of the real challenges that people face when trying to sort out whether their memories are normal or not," Budson explained. "But you can read the book without the stories if you just want to focus on the information."

Below you will find a summary of each of the Seven Steps discussed in this book.

STEP 1: Learn what is normal memory

Memories for episodes of our lives are bound together by the memory center of the brain, the hippocampus. Memories fade with time but can be strengthened when they are retrieved. Attention is important when forming and retrieving memories. Even in healthy individuals, memories can become mixed up and distorted over time. Our frontal lobes help us pay attention, store and retrieve information, and organize our memories. Older frontal lobes don't work quite as well as they did when they were younger, requiring us to put in more effort to pay attention, learn new material, and recall information and events.

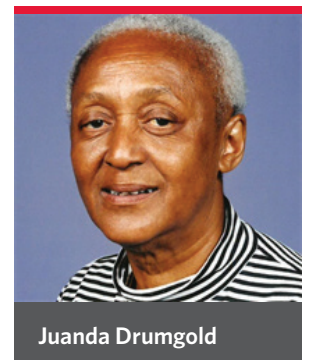
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In loving memory of
BU ADC Advocate
Ms. Juanda Drumgold

"Seniors aren't asking for anything extra; they're asking for what was promised to them."

— Ms. Juanda Drumgold . . 12



Juanda Drumgold

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STEP 2: Determine if your memory is normal

Common memory problems in individuals with Alzheimer's disease include getting lost, losing things, trouble with planning and organizing, and difficulties finding words. Alzheimer's damages the hippocampus, leading to rapid forgetting of information. Even when information is learned well, it may be lost permanently within days, hours, or even minutes. Depression and anxiety are also common in Alzheimer's. Memory disorders are more common as we get older. If your memory problems are interfering with your activities or your function, you should definitely have your memory evaluated. There are many different diseases and conditions that cause memory loss—and some may be treatable—so seeing your doctor is the first step.



STEP 3: Understand your memory loss

There are many causes of memory loss that are potentially reversible, including medication side effects, thyroid disorders, vitamin deficiencies, poor sleep, use of illegal drugs, excessive alcohol, anxiety, and depression. There are also medical problems that can cause memory loss, such as head injuries, hydrocephalus, seizures, and diabetes, as well as Lyme disease and other infections. Dementia is a general term meaning that thinking and memory are impaired enough to cause trouble with day-to-day function. Mild Cognitive Impairment (MCI) occurs when thinking and memory are only mildly impaired, and function is normal. Alzheimer's, Parkinson's, vascular, and other diseases can cause either MCI or dementia depending upon how severe they are.

STEP 4: Treat your memory loss

Alzheimer's disease and other causes of memory loss can be treated. Today, cholinesterase inhibitors (such as donepezil/ Aricept) can improve thinking and memory by turning back the clock on memory loss by six to twelve months. New medications, currently available only in clinical trials, have the potential to slow down the deterioration caused by Alzheimer's. Although a cure may be unrealistic, the goal is to make Alzheimer's something you can live with, like any other chronic disease. It is common to feel anxious about changes in your memory and to feel sad if you have been diagnosed with a memory disorder. It is important to deal with these emotions, as feeling anxious or sad can worsen or actually cause memory problems. There are different pharmacological treatments for anxiety and depression, and studies have found that aerobic exercise, meditation, relaxation therapy, and support groups can all help.

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About Us

The Boston University Alzheimer's Disease Center (BU ADC) aims to reduce the human and economic costs of Alzheimer's disease through the advancement of knowledge. We conduct cutting-edge Alzheimer's research and provide education about aging and dementia to professionals and communities in Boston and beyond.

The BU ADC Education core publishes the *BU ADC Bulletin* twice per year. It includes stories about research findings, new studies, and more.

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STEP 5: Modify your lifestyle

Diet can impact brain health. There isn't one single food item that can improve memory, but rather it is important to focus on overall dietary health. Mediterranean-style diets that emphasize increased consumption of the following foods have been proven to be most beneficial to brain health:

Fish • Vegetables • Olive Oil • Avocado • Fruits • Nuts • Beans • Whole Grains



Exercise can strengthen your memory and thinking. Exercise improves your physical health by increasing cardiovascular fitness, promoting weight loss, improving sleep, and reducing the risk of strokes and falls. Exercise also improves your mood by releasing neurotransmitter brain chemicals that can make you feel good. Importantly, exercise releases growth factors in your brain that can enhance your thinking and memory, and the release of these growth factors can even increase the size of your brain!

STEP 6: Strengthen your memory

There is currently not enough evidence for online and computerized brain-training games to justify the investment of time and money. Engaging in mentally stimulating activities may be beneficial for brain health—particularly those that are novel and challenging such as learning a new hobby. Social activities and having a positive mental attitude about aging can improve emotional well-being and provide the motivation needed to make healthy lifestyle changes (such as exercising and eating healthy) that can improve memory, thinking, and brain health. There are a number of strategies and aids you can use to help improve memory in everyday life, including practicing active attention, repeating information spaced over time, making connections, creating visual images, testing yourself, and using pillboxes and calendars. When using a memory aid, follow the three golden rules: Don't delay, Keep it simple, and Make it routine.

STEP 7: Plan your future

There are a few life changes that are important to make if you are having memory problems. Give away guns and power tools. Take advice from family and friends when it comes to investing, managing money, and deciding if you should have a driving evaluation. Find a paid or volunteer job that you enjoy and that memory issues won't interfere with. Talk with friends and family about your memory so that they can understand and be supportive. Make sure your living situation is right for you and get help if you need it. Lastly, everyone should have legal documents such as a living will and power of attorney in place now—don't wait for a crisis to occur! Don't let concerns about your memory become overwhelming or disabling. Be proactive about memory problems.

If you would like to learn more about the Seven Steps to Managing Your Memory, the book is available from Amazon and your local bookstore.

NIH renews Boston University Alzheimer's Disease Center's multi-million-dollar grant

The National Institutes of Health and the National Institute on Aging renewed a three-year \$5.4 million research grant for the Boston University Alzheimer's Disease Center on Aug. 25. The grant will allow the center to continue its research on ways to manage and reduce the effects of Alzheimer's disease.

The ADC will be using the grant money over the course of the next three years for three different but interconnected purposes:

We will continue our collaboration with national and international projects aimed at better understanding the cause of Alzheimer's disease ... and most importantly, working toward treatments and cures for Alzheimer's disease.

Secondly, our center will continue to focus on finding ways to better understand Alzheimer's and the potential treatment options. For example, Dr. Andrew Budson's laboratory is using computer-based memory tests to develop new strategies and memory aids that can improve memory in individuals' day-to-day lives.

And thirdly, the grant will allow researchers from the BU ADC and the CTE Center, which is inside the BU ADC, to continue their pioneering work on understanding the cause and features of chronic traumatic encephalopathy.

Check out page 6 for Currently Recruiting BU ADC Studies and Clinical Trials and Page 8 for BU ADC Research Updates!

Chronic Traumatic Encephalopathy (CTE) Found in 99 Percent of Former NFL Players Studied

On July 25th, 2017, **Dr. Ann McKee, MD**, Director of the CTE Center, and her team released the largest and most methodologically rigorous case series of individuals diagnosed with CTE ever published in the *Journal of American Medical Association (JAMA)*. The JAMA study more than doubled the number in their previous CTE case series from 2013, and all the participants were exposed to a relatively similar type of head trauma while playing football. Dr. McKee and her team of neuropathologists, using defined diagnostic criteria, made the diagnosis of CTE without any knowledge of the clinical history.

Dr. Jesse Mez, Associate Director of the Clinical Core at the BU ADC and first author of the study, performed standardized and comprehensive interviews with family members while blinded to the pathological findings and reviewed the findings with a team of clinicians.



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Register Today!

BU Chronic Traumatic Encephalopathy Continuing Medical Education Course

Dates: November 9th and 10th, 2017

Location: Boston University, Metcalf Trustee Center, 1 Silber Way, Boston, MA 02215

The Boston University Alzheimer's Disease and Chronic Traumatic Encephalopathy Center will be holding a Continuing Medical Education Course on November 9th and 10th, 2017. During this two-day course participants will learn about all aspects of CTE, including its pathology, pathophysiology, genetics, biomarkers, imaging, clinical syndromes, clinical criteria, differential diagnosis, impact on veterans and implications for the family, and what it is like to live with or worry about the disease. We will be joined by distinguished presenters from our center and from around the world, as well as athletes who will talk about their experience playing contact sports.

Continuing Medical Education Credits will be provided. Please refer to the conference website for details. www.cteconference.com

About the Athlete Panelists



Mike Adamle played six years as a running back in the NFL for the Kansas City Chiefs, New York Jets and Chicago Bears. He was a fourth-round pick out of Northwestern in 1971, where he was team captain and the Big 10 MVP in 1970. During his nearly 40-year distinguished broadcasting career, he has covered the NFL, USFL, and Summer Olympics, and announced WWE, American Gladiators, and many other sports and entertainment events. In February 2017, Adamle publicly disclosed he had been diagnosed with dementia and revealed that doctors had told him his dementia is likely caused by Chronic Traumatic Encephalopathy (CTE).



Ted Johnson is a former New England Patriots linebacker and 3-time Super Bowl winner. After 10 seasons in the NFL, Johnson retired in 2005, having sustained many diagnosed and undiagnosed concussions during his career. In 2008, Johnson became the first athlete to pledge to donate his brain to the VA-BU-CLF Brain Bank for CTE research. Presently, Johnson hosts a radio show in Houston, TX.



Kevin Stevens is a two-time Stanley Cup Champion, two-time 100-point scorer, and former left wing for the Pittsburgh Penguins and Boston Bruins. Stevens' promising career was derailed in 1993 when he suffered a concussion after a hit that resulted in him losing consciousness in the air and landing face-first on the ice, unable to brace his fall.

The case series involved 202 American football players at all levels whose brains were donated to the BU-VA-CLF Brain Bank for research. Eighty-seven percent of the brain donors were diagnosed with CTE using strictly defined pathological criteria, including 3 of 14 high school football players (21%), 48 of 53 college football players (91%), and 110 of 111 NFL players (99%). The brains analyzed were from players as young as 23 and as old as 89, and every position on the field was represented – quarterbacks, running backs, linebackers, and even a place-kicker and a punter.

Among the former NFL players, the CTE pathology was often severe. In players with either mild or severe CTE pathology, behavioral, mood and cognitive problems were frequent. Dementia was common among those players with severe CTE.

Such a richness of data regarding the clinical and pathological features of CTE has never been previously compiled.

The study represents an important advance to the medical literature and an enormous scientific advance in our understanding of CTE.

CTE is a progressive degenerative disease of the brain found in athletes and military veterans with a history of repetitive brain trauma, including symptomatic concussions as well as asymptomatic subconcussive hits to the head. CTE is associated with behavioral changes, depression, memory loss, impaired judgment, impulsivity, suicidality, aggression, and, eventually, dementia.

The BU CTE Center research has played a major role in expanding our understanding of mild traumatic brain injury (TBI) and CTE and in changing public awareness about the dangers of repetitive head impacts, including concussion, subconcussion and blast-related injury. The BU CTE Center has been essential in establishing the neuropathological diagnostic criteria, developing a pathological staging scheme for the severity of CTE pathology, and delineating the clinical pathological correlations of CTE.

The overarching goal of the CTE Center is to create a safer environment for all contact-sport athletes, military personnel and other individuals exposed to repetitive head impacts.

For more information about participating in research and about CTE in general, please visit <https://www.bu.edu/cte/>.



Dr. Ann McKee, M.D.



Dr. Jesse Mez, M.D.

Community Events & Programs

The BU ADC holds many educational events and programs for community members, and its faculty speak at a variety of community education events throughout Massachusetts and southern New Hampshire. We also conduct numerous educational activities for health care professionals and researchers.

To request a speaker for a community education event, get in touch!

E: JoinADC@bu.edu | P: 857-364-2140

Honorary and Memorial Contributions

The Boston University Alzheimer's Disease Center is involved in a variety of clinical, research and educational activities. Research study participants, families and community leaders often wish to contribute to the fight against Alzheimer's disease. We welcome honorary and memorial donations. These gifts are an excellent way to honor a family member or friend while contributing to the advancement of Alzheimer's research. **To make a donation, please call Suzanne Maselli in the BU Development Office at 617-638-5676 or visit us online: www.bu.edu/alzresearch.**

The BU ADC would like to recognize the following private donors for their greatly appreciated contributions, which were made between January 2017 and August 2017. Please note that anonymous donors are not listed.

In Honor of Ginny Timmons

James Morse and Roni Morse
Andy Stephens and Jeanne Stephens
Ruth N. Stuart
Gregory Timmons and Colleen Timmons
Mary Wirken

In Memory of Doreen A. Croke

Robert D. Manchester and
Shirley A. Manchester

In Memory of James Harmon

Heidi S. Kimball and John Kimball
Christy Weiss

In Memory of John T. Miller

John W. Anderson and Carol J. Anderson
Mark E. Florennce and Lynn Hendrickson
Richard J. Simmons and Anne C. Simmons

In Memory of Katherine A. Finnigan

Dassie Bheechan
Boston Latin School
Sandra Christison
Darryl A. Forgione and Norma L. Forgione
Friends of Kay Finnigan
Patricia A. Kelleher
Richard W. Pugsley and Mary A. Pugsley
Maryann F. Sava
Frank Scanlon and Kay Scanlon
Staff of James J. Chittick School

In Memory of Rose Marc

Robert Pipich

Actively Recruiting Studies

AD = Alzheimer's Disease; MCI = Mild Cognitive Impairment

STUDY TITLE	STUDY DESCRIPTION	STUDY AGE RANGE	CURRENTLY RECRUITING
Health Outreach Program for the Elderly (HOPE)	HOPE is the main registry of participants. People who join HOPE attend a yearly visit in which their memory and thinking abilities are evaluated. They also participate in other BU ADC-affiliated studies.	65 or older with or without memory concerns or 50 or older with memory concerns.	Healthy Adults, MCI, AD
Alzheimer's Disease Neuroimaging Initiative 3	ADNI 3 aims to determine the relationships between the clinical, cognitive, imaging, genetic and biochemical biomarker characteristics of the entire spectrum of Alzheimer's disease (AD).	55-90	Healthy Adults, MCI, AD
Feasibility of using physical activity monitoring for enhancing cognition in healthy seniors	This study is investigating the effects of exercise on cognitive functioning. The goal is to examine whether digital self-monitoring of physical activity can improve cognition and functional fitness compared to an aerobic exercise program of the same duration.	55-85	Healthy Adults
Aerobic Exercise, Neurotrophins, and fMRI of Hippocampal Function and Structure	This study is investigating the effects of exercise on cognitive functioning. The goal is to compare two groups (cardio and flexibility) and their respective effects. A central aim is to better understand the effect of exercise on brain function and several proteins in the blood.	18-35 & 55-85	Healthy and Sedentary Adults
Subclinical Paroxysmal EEG Abnormalities in Alzheimer's Disease	The purpose of this research study is to find out if patients with early Alzheimer's disease have periods of abnormal brain activity, such as seizures, that might explain some of their memory problems.	50-90	Healthy adults, MCI, LD
DAYBREAK	The DAYBREAK study is a clinical research study in mild Alzheimer's disease. The study will examine an oral investigational drug called LY3314814. The drug may have some effect on the brain changes associated with Alzheimer's disease. The study is designed to find out whether this investigational drug (or "study drug") can slow down the decline in memory and mental functioning.	55-85	Probable AD
Near Infrared Spectroscopy and Electroencephalography of Brain Function	This study is designed to research a new system designed to measure brain activity by taking a series of measurements while a variety of tasks are performed.	65-74	Healthy Controls and MCI
Diagnostics, Imaging, And Genetics Network for the Objective Study and Evaluation of CTE	This new project entitled Diagnostics, Imaging, And Genetics Network for the Objective Study and Evaluation (DIAGNOSE) of Chronic Traumatic Encephalopathy (CTE) is looking to develop diagnostic criteria for CTE. Dr. Stern is the contact PI (other PIs are J. Cummings, E. Reiman, and M. Shenton) of this \$16 million, multi-center, multi-disciplinary, 7-year grant to further his initial work on the development of in vivo biomarkers for CTE and clinical diagnostic criteria. This study is funded by the NIH/ NINDS and will begin recruitment in summer 2016. Former NFL players, former college football players, and "control" participants between the ages of 45 and 74 will be recruited for examinations to be held at one of four locations (Boston, New York, Las Vegas, Scottsdale/Phoenix).	45-74	Control
A Phase 2b/3 Randomized, Double-blind, Placebo-Controlled, Parallel Group, Multicenter Study Investigating the Efficacy and Safety of JNJ-54861911 in Subjects who are Asymptomatic At Risk for Developing Alzheimer's Dementia	This study examines the effects of a BACE inhibitor on preventing cognitive decline in participants with no cognitive impairments. The primary objective of this study is to determine whether treatment slows cognitive decline compared with a placebo treatment, as measured by a composite cognitive measurement, the Preclinical Alzheimer Cognitive Composite (PACC), in amyloid-positive subjects who are asymptomatic at risk for developing Alzheimer's Dementia.	50-85	Control
Metal Exposure and Alzheimer's Disease	The primary aim of this project is to determine whether environmental metal exposure increases risk of Alzheimer's disease (AD). Draw less than two tablespoons of blood from the participants' veins. This will take about 5 minutes. The blood will be tested for metal and dementia-related proteins and genes, including ApoE4, which has been shown to be a risk factor for Alzheimer's disease.	50-100	Controls & Probable AD

Interested? Contact the BU ADC recruitment coordinator at 617-414-1077 or joinADC@bu.edu.

STUDY TITLE	STUDY DESCRIPTION	STUDY AGE RANGE	CURRENTLY RECRUITING
Memory in AD	This study looks at participant responses to certain cognitive testing. Research suggests that patients with different types of brain problems perform differently on certain tests. The goal of this study is to better understand how different brain problems affect perception, thinking and memory, hopefully leading to better diagnostic evaluations.	65-90	Healthy Adults, MCI, AD
Optical Spect Study	This study is looking to detect changes in the brain associated with aging and cognitive impairment using near infrared spectroscopy (NIRS).	65-85	Healthy Adults, MCI, AD
Risk Evaluation and Education of Alzheimer's Disease – the Study of Communicating Amyloid Neuroimaging	REVEAL-SCAN is an NIH-funded, multisite clinical trial that will explore the impact of learning amyloid imaging results among asymptomatic older adults, and how to safely communicate these results and educate on the risk of developing Alzheimer's disease (AD). Participants will receive a personalized AD dementia risk assessment based on these known factors, though APOE status will not be disclosed. Half of the participants will be randomized to the "initial disclosure arm" to also learn their scan result at that time, while the other half in the "delayed disclosure arm" will learn their scan result at the end of the study. Psychological, neuropsychological and behavioral outcomes are collected pre-randomization and at 6 weeks and 6 months post disclosure.	65-80	Control
Home-Based Electronic Cognitive Rehabilitation	This study examines how repeated training on tests of language, attention, and memory can help improve thinking in patients with mild cognitive impairment and patients with Alzheimer's disease. The tasks will be administered on an iPad device, and participants will be asked to complete these tasks over the course of several months. During this time, we will monitor performance on the tasks. All sessions for this experiment will be completed in the home.	50 - 90	AD or MCI
Utility of EEG in a Memory Disorders Clinic	Study investigating the use of event-related potentials to diagnose AD in the clinic. The funding of \$150,000 over three years allows extension of the project to include amyloid PET scans for participants as well as quantitative MRI techniques. Ultimately the project will compare the diagnosis of AD using event-related potential techniques to amyloid PET techniques as a gold standard.	50-100	Anyone with a Memory Disorder

Interested? Contact the BU ADC recruitment coordinator at 617-414-1077 or joinADC@bu.edu.

Val Nolen, BU ADC Community Liaison

"I passionately believe there is power in knowledge. The BU ADC is committed to maintaining and sustaining partnerships that encourage and promote timely outreach and knowledge to families and communities." Val Nolen, Senior Facilitator/Community Liaison

Val Nolen, BU ADC Community Action Council Leader and Community Liaison, was chosen to sit on a panel at A Map Through the Maze (MAP), a conference held by the Alzheimer's Association, titled: Diversity and Dementia: Latino/Hispanic, African American and Asian Perspectives of Individuals with Dementia and Their Caregivers. MAP offers professionals a unique opportunity to learn current and cutting-edge information on a wide range of Alzheimer's-related care topics, including meaningful engagement, the latest on treatment and medications, research updates, working with families, hands-on care techniques and much more. Cultural competency and understanding clients' norms and values are an important part of dementia care. This workshop provided a general understanding of three distinctive cultural aspects of persons with dementia and their caregiving approach.



Research Updates

Dr. Jesse Mez, MD, MS, Clinical Core Associate Director of the BU ADC and Assistant Professor of Neurology at BUSM, leads the clinical arm of Ann McKee's Understanding Neurologic Injury and Traumatic Encephalopathy (UNITE) study and was co-first author on the *Journal of American Medical Association (JAMA)* manuscript (see page 6). His work focuses on several aspects of CTE, including deciphering the clinical and pathological correlation, understanding how exposure to repetitive head trauma relates to CTE risk, and investigating gene-environment interaction. He also has several ongoing projects investigating the genetics of Alzheimer's disease, including identification of genetic risk loci associated with variation in neuropsychological performance among those with AD. His work is funded by the National Institutes of Health, the Alzheimer's Association, the Department of Defense and the Concussion Legacy Foundation.

Dr. Katherine Turk, MD, Instructor in Neurology at BUSM and Physician Scientist pursuing fellowship training at the Veterans Affairs (VA) Boston Healthcare System, was awarded the Alzheimer's Association Clinical Fellowship Award under the mentorship of Dr. Andrew Budson. She will focus her efforts on a study investigating the use of event-related potentials to diagnose AD in the clinic. The funding of \$150,000 over three years allows extension of the project to include amyloid PET scans for participants as well as quantitative MRI techniques. Ultimately, the project will compare the diagnosis of AD using event-related potential techniques to amyloid PET techniques as a gold standard. During Dr. Turk's first year of this project, over a hundred participants have had their EEGs captured, and data analysis is underway.

2017-2018 Alzheimer's Association Grant Award Winners

Dr. Karin Schon, PhD, and colleagues were awarded a new Alzheimer's Association Research Grant: "Perceived racism as a chronic stressor and cognition in Black Seniors." This funding will enable Dr. Schon to examine whether chronic stress due to daily and lifetime experiences of discrimination related to racial minority status — racism — negatively affects brain function in two subgroups of Black seniors that differ in their exposure to racism. A larger percentage of African Americans than Americans of European ancestry have Alzheimer's disease. The reasons for this health disparity are unclear. Discrimination related to racial minority status is a known chronic stressor that contributes to health disparities in some cardiovascular disease risk factors, such as obesity and hypertension. The Alzheimer's health disparity may, in part, be explained by differences in racism-related chronic stress. Experiences of racism are common among African Americans, the largest minority group in the continental United States. The hippocampus, a brain area critical for memory formation, is impacted by both Alzheimer's disease and chronic stress. Dr. Schon's research team, led by PhD student Michael Rosario, will investigate whether African American seniors who experience higher levels of chronic stress due to racism will show poorer cognition and hippocampal function, and elevated salivary cortisol, a physiological marker of the stress response, independently of other stressors, such as those related to socioeconomic status and poverty. ***The new pilot study has two aims: first, in collaboration with Dr. Lynn Rosenberg and Dr. Yvette Cozier of the Black Women's Health Study (BU Slone Epidemiology Center, SPH), Dr. Schon's group will examine whether racism-related chronic stress in African American seniors could lead to poorer cognition, elevated cortisol, and a dysfunctional hippocampus. Second, in collaboration with Dr. Aletha Baumann of the University of the Virgin Islands (UVI) on St. Croix, United States Virgin Islands, they will compare African American seniors living in the City of Boston, where African Americans are members of the racial minority, with African American seniors living on St. Croix, where they are members of the racial majority, on cognitive function and cortisol level.*** This work could generate a new hypothesis: individuals experiencing racism-related chronic stress may show accelerated cognitive decline consistent with the amnesic presentation of Alzheimer's dementia. Michael Rosario, a new PhD student in BU's Graduate Program in Neuroscience, is an alum of BUMC's Summer Training Research Program (STaRS) and has a Bachelor of Science degree in Psychology from UVI. He was born and raised on the Caribbean island of St. Croix.

Dr. Michael Alosco, PhD, a BU ADC Investigator, along with **Dr. Lin Alexander, PhD**, who is the head investigator at the primary study site at Brigham and Women's Hospital, received a new Alzheimer's Association Grant. ***Their study will use enhanced arterial spin labeling (eASL) and magnetic resonance (MR) two-dimensional J-resolved spectroscopy (2D-JPRESS) to test whether individuals at high risk for chronic traumatic encephalopathy (CTE) exhibit patterns of cerebral blood flow (CBF) and glutamate (Glu) metabolism that are distinct from aging and Alzheimer's disease (AD) dementia.*** This study will further examine whether CBF and Glu may be involved in the pathogenesis of CTE through testing their correlations with PET p-tau and clinical function. They will use cutting-edge eASL technology (transit-insensitive perfusion quantification) and novel MRS methods (2D-JPRESS provides specific characterization of brain metabolites) to improve understanding on the relations among CBF, Glu, and neurodegeneration in general and CTE and AD dementia in particular. This study will utilize resources

from a NINDS-funded U01 (NS09334; Lead PI: Stern, investigator of this study) examining biomarker development for CTE, and from the NIA-funded Boston University Alzheimer's Disease Center. It will include 15 former male NFL players (ages 45-74) at high risk for CTE and 15 same-age male NC from the U01, and 15 same-age males with AD dementia from the BU ADC. In addition to existing medical, cognitive, neuropsychiatric, and neuroimaging protocols, all subjects will complete eASL and 2D-JPRESS for the proposed study. This study will provide initial support for eASL and 2D-JPRESS as practical tests to detect CTE during life and distinguish it from AD dementia, and facilitate research on risk factors, mechanisms, prevention, and treatment of neurodegenerative disease in general and CTE in particular.

Diagnostics, Imaging, And Genetics Network for the Objective Study and Evaluation of Chronic Traumatic Encephalopathy (DIAGNOSE CTE) Research Project

The DIAGNOSE CTE Research Project is a \$16 million, 7-year, multi-site study, funded by the National Institutes of Health, led by **Dr. Robert Stern, PhD**, Clinical Core Director of the BU ADC, with co-principal investigators at the Cleveland Clinic, Banner Alzheimer's Institute, and Harvard Medical School. The project is entering the second year of enrollment. CTE is a progressive degenerative brain disease, similar to Alzheimer's disease, which is associated with repetitive hits to the head, such as those experienced in football and other contact sports. Currently, CTE can only be diagnosed after death. ***The major goal of this research project is to develop methods of diagnosing CTE during life and to examine risk factors for the disease.*** The study is looking for volunteers ages 45-74 who are either former NFL players, former college football players, or healthy men who have never participated in contact sports. For more information, go to www.diagnosecte.com or contact the Recruitment Coordinator at 617-414 1193/diagnose@bu.edu.

Supporting Caregivers through Research

Dr. Maureen O'Connor, PsyD, and colleagues finished collecting their caregiver study data and were able to analyze their results. There were several findings highlighted below that they found very interesting.

During their first project, Dr. O'Connor sought to understand the changes in emotional perception that take place in individuals diagnosed with Alzheimer's disease and the role that these changes play in the experience of spousal caregivers. They were interested in understanding whether changes in emotional perception would contribute to caregiver distress, caregiver burden and the quality of the marital relationship, hypothesizing that there would be more negative outcomes for those who have spouses with greater changes in emotional perception. ***Findings revealed that individuals with Alzheimer's disease exhibit changes in their ability to interpret the emotions of others through facial expression and tone of voice compared to healthy older adults. Surprisingly, O'Connor and colleagues found that the preservation of emotional perception in patients is related to worse outcomes for caregivers!*** This is an incredibly interesting and novel finding that suggests that the focus should be on treating couples early in the disease process, when emotional perception remains well-preserved, in a manner that allows couples to better manage emotional interactions to maintain intimacy and reduce frustration, anger, and irritability that can erode the marital relationship.

In their second study, conducted in collaboration with Dr. Renee Beard, ***they conducted in-depth interviews with couples in which one spouse had a diagnosis of Alzheimer's disease to better understand the experience of spouses trying to manage the disease.*** Through an analysis of the data, they identified a unique pattern: spousal caregivers tend to take a "We-Us" (we are in this together) or "I-Me" (I am caring for my spouse by myself) approach to caregiving. In this first study, they simply identified these two styles to approaching caregiving, without yet understanding what they might mean or how stable or fluid they might be throughout the caregiving experience. So, for example, while it is tempting to consider the "We-Us" approach a "better" or "more loving" approach, there may actually be some protection offered by distancing oneself from a spouse with Alzheimer's disease (the "I-Me" approach) and benefit from relieving that spouse of some of the burdens of partnership.

The next step in their research is to focus on their study #2 findings (We-Us vs I-Me approaches to caregiving). Dr. O'Connor is currently developing a measure to help identify which of these two approaches caregivers take. This will allow her to answer a number of questions, such as "How are these approaches associated with caregiver variables like burden and stress?"; "Do these approaches change longitudinally?" (for example, as patients become more impaired, do some couples move from We-Us to I-Me in order to distance in preparation for patient death?); "Do spousal caregivers differ in their approach compared to other groups of caregivers, such as adult children?"; and "Is one approach associated with better patient outcomes?" Understanding the issues involved in how dyads afflicted with Alzheimer's disease experience their relationship will allow professionals to work more productively with caregivers in an effort to maximize the relationship between caregiver and care recipient and improve caregiver and patient outcomes.

Longest Day By Nicole Gullotti, Recruitment Coordinator

On June 17th, the town of Watertown came together to honor and commemorate the hours and energy that an Alzheimer's caregiver puts in each day. Several members of the BU ADC had the privilege of joining in the day.

The fearless team made up of over 100 members, known as This Is Our Life, participated in over 16 hours of community activities to raise awareness and funds for Alzheimer's disease. The Alzheimer's Association's "The Longest Day" was originally designed to take place on June 21st, the summer solstice and the longest day of the year, though participants are welcome to partake on any day of their choosing. On June 17th, This Is Our Life kicked off their event with a walk around Victory Field. The children of the families who attended the walk did a lap on their own, representing the future and our hope: a world without Alzheimer's disease. The rest of the team joined in before departing for the day's festivities. The kids hosted lemonade stands around town, another group competed in a horseshoe tournament, and the rest retreated back to Quirk Street for games, food, and a day spent together.

Around 5pm, all reunited to create "the longest dinner table." A string of 8-foot tables were connected end to end, prepared to seat the 50 people expected for dinner, but around 5:15pm neighbors came bustling out of their houses with food for the potluck, and many more familiar faces came bouncing down the street. By 6pm, 120 people had contributed to the table with food, wine, and conversation. It was a testament to the community surrounding the families affected and a true spark of hope to cap off the day.

When the sun began to set, all convened in a large circle for the closing ceremony. Each person held a glowstick that they would individually add to the center of the circle, one by one sharing what brought them there. In closing, the hosts shared what they call their battle cry:

So to you, Alzheimer's, we say this:

We have had enough. We are coming to end you, and it will happen because we are the relentless ones, an unforgiving mob, and we start this revolution by removing the mask you've worn for too long, hiding from the public eye. The light is on you now, and we are fiercely united by our shared goal of a world without you in it. – R. Martin

To all the familiar faces we saw that day and all of the new friends we made: Thank you for sharing this event with us, and thank you for being such a driving force in the fight to end Alzheimer's disease.

Food for Thought

Community members participated in an event titled "Food for Thought" at the New England Center for Arts & Technology on May 6th, 2017. Presenters Dr. Maureen K. O'Connor and Dr. Robert Stern highlighted the following topics: Lifestyle Factors & Brain Health, Current Understanding of Alzheimer's Disease, and Current and Future Research.

Following the presentations, participants enjoyed a delicious Mediterranean cooked meal. The Mediterranean diet has been proven in research to support memory and brain health.

Learn more about the Mediterranean diet on page 3.

BU ADC joins the Walk to End Alzheimer's

What a beautiful day for an Alzheimer's Association Walk! On September 24th in Cambridge, MA, the Boston University Alzheimer's Disease Center proudly walked together with

our partners at Senior Living Residences' Boston communities to help raise awareness and funds towards Alzheimer's research and supportive/educational services. The BU ADC staff and faculty raised **\$5,992.25**.



The BU ADC team supported the Alzheimer's Association at the Greater Boston Walk to End Alzheimer's in Cambridge.

BU ADC Happenings

Welcome

The Boston University Alzheimer's Disease Center (BU ADC) and its affiliate, the Chronic Traumatic Encephalopathy Center (CTE Center), would like to extend a warm welcome to new faculty members and employees:

BU ADC Staff

Laney Evers, Neuropathology Core & CTE Center Research Assistant, received a Bachelor of Science in Biology and minor in Chemistry from Duke University in Durham, North Carolina in 2016. As an undergrad, Laney worked in a genetics lab studying wing mutations associated with the IP3K2 gene in fruit flies. She joined the CTE Center in September 2016 as a research assistant and plans to attend medical school in the future.

Audrey Hildebrandt, BU-VA-CLF Brain Bank & CTE Center Research Assistant, received a Bachelor of Arts in Neuroscience from Mount Holyoke College in 2016. During her time at Mount Holyoke, she worked as a student researcher in a lab studying the biomechanics and proprioception involved in toad landing. Following her work in systems biology, she joined the VA Brain Bank in November 2016, where she assists in collection and distribution of CNS tissue and histological preparation of CTE and PTSD cases.

Goodbyes Many thanks and best wishes to departing BU ADC and CTE Center staff:

Christine Chaisson, MPH, BU ADC Data Core Director, left to pursue a new professional opportunity.

Patrick Kiernan, BU ADC Neuropathology Core & CTE Center Research Assistant, left to pursue her medical school degree at Midwestern University Arizona College of Osteopathic Medicine.



Grove Hall Seniors Found Their Groove with the BU ADC

Dr. Schon, BU ADC Investigator, and her research students educated seniors at Grove Hall Senior Center in Dorchester, MA about the importance of exercise and what has been learned through their research. Research has shown that exercise is good for you whether you're 49 or 94. An ideal exercise program includes at least thirty minutes daily of aerobic exercise plus additional exercise for strength, balance, and flexibility each week. It is important for you to check with your doctor before starting a brand-new exercise program. Research has also shown that exercise reduces the risk of strokes, helps prevent you from falling, improves sleep and mood, releases growth factors that produce new brain cells, improves thinking, memory, and quality of life.

If you're interested in learning more about participating in Dr. Schon's research studies, see page 8 for details. To learn more about the importance of exercise, please see page 3.



***In Loving Memory of Juanda Drumgold,
BU ADC Community Action Council Member & Advocate***

Ms. Juanda Drumgold, 82, of Dorchester, passed away on October 4, 2016, and has been missed ever since. Originally from Brockton, Ms. Drumgold initially moved to the South End neighborhood of Boston where she and her sister, Patricia Drumgold, worked to raise their family before moving and settling into the Franklin Field Public Housing Development. She worked with the City's Elderly Commission, took an active role in Age-Friendly Boston, and appeared on the television show *Seniors Count*. She also volunteered through Grandparents Raising Grandchildren and Boston University Alzheimer's Disease Community Action Council.

Ms. Drumgold was known for her ability to put a smile on the faces of all the BU ADC Community Action Council (CAC) members. She told us exactly what her seniors in Boston needed and came up with great ideas for how we could help them. She will also always be remembered for her ability to provide a fun exercise break at the BU ADC HOPE Brunches.

Mayor Martin J. Walsh, Boston Housing Authority Administrator Bill McGonagall, and the Franklin Field community honored the late Ms. Juanda Drumgold, a longtime resident in the public housing development. The Franklin Field Senior Center on Ames Street was renamed in memory of Ms. Drumgold.

