

Southern Illinois University School of Medicine

6th annual scientific conference

**Healthy Brain Aging:
Alzheimer's Disease Risk and Protective Factors**

May 21, 2013



Sponsored by

 **SIU School of Medicine**

*Center for Alzheimer's Disease
and Related Disorders*

James T. Dove, MD Conference Center
Prairie Heart Institute
619 E. Mason Street
Springfield, IL

About this Conference

Can we build a better brain? Can we decrease the likelihood of developing cognitive impairment as we age? Accumulating evidence indicates that there are a wide variety of lifestyle risk and protective factors that affect brain health and cognitive health. This conference will present useful, empirically-based evidence regarding risk and protective factors for healthy versus unhealthy brain/cognitive aging.

Who Should Attend

This program is designed for clinicians, researchers, and other professionals in health care, wellness and aging; interested others are also welcome to attend. Continuing education credit is available for physicians (*AMA PRA Category 1 credits*[™]), nurses, social workers, counselors and nursing home administrators.

Conference Faculty

Fergus Craik, PhD, FRSC, FRS

Senior Scientist
Baycrest Centre for Geriatric Care
Toronto, Ontario, Canada

Suzanne M. de la Monte, MD, MPH

Professor of Pathology (Neuropathology),
Neurology and Neurosurgery
Alpert Medical School
Brown University and Rhode Island Hospital
Providence, Rhode Island

Arthur F. Kramer, PhD

Director, Beckman Institute
Professor, Department of Psychology
University of Illinois –Urbana-Champaign
Urbana, Illinois

Prashanthi Vemuri, PhD

Assistant Professor of Radiology
Aging and Dementia Imaging Laboratory
Mayo Clinic
Rochester, Minnesota

Ron Zec, PhD, ABPN, ABPP (CN)

Associate Professor, Center for Alzheimer's
Disease and Related Disorders
Departments of Neurology and Psychiatry
SIU School of Medicine
Springfield, Illinois

SIU School of Medicine Course Co-Directors

Tom Ala, MD

Interim Director, Center for Alzheimer's Disease and Related Disorders
Associate Professor of Clinical Neurology

Ron Zec, PhD, ABPN, ABPP (CN)

Associate Professor, Center for Alzheimer's Disease and Related Disorders
Departments of Neurology and Psychiatry

Agenda at a Glance

- 7:30 a.m. - 8:15 a.m. Registration & Exhibits Open
Light continental breakfast available
- 8:15 - 9:20 **Overview of Risk and Protective Factors for Alzheimer's Disease**
Ron Zec, PhD, ABPN, ABPP (CN), SIU School of Medicine, Springfield, Illinois
- 9:20 - 10:20 **Effects of Bilingualism on Cognitive Aging and Dementia**
Fergus Craik, PhD, FRSC, FRS, Baycrest Centre for Geriatric Care Toronto, Ontario, Canada
- 10:20 - 10:35 Break
- 10:35 - 11:35 **Physical Activity and Exercise: Implications for Healthy Brains and Minds**
Arthur F. Kramer, PhD, Beckman Institute, Department of Psychology, University of Illinois –Urbana-Champaign, Urbana, Illinois
- 11:35 - 12:00 Question & Answer Panel
- 12:00 p.m. - 1:00 p.m. Luncheon
- 1:00 - 2:00 **Biomarkers, Cognition, and Cognitive Reserve in Alzheimer's Disease**
Prashanthi Vemuri, PhD, Department of Radiology, Mayo Clinic, Rochester, Minnesota
- 2:00 - 2:15 Break
- 2:15 - 3:15 **Mediators of Brain (Type 3) Diabetes: Contributions of Lifestyles, Genes, and Aging to Alzheimer's Disease Pathogenesis**
Suzanne M. de la Monte, MD, MPH, Alpert Medical School of Brown University and Rhode Island Hospital, Providence, Rhode Island
- 3:15 - 4:00 Question & Answer Panel and Conference Summary

Session Descriptions

8:15 - 9:20 a.m.

Overview of Risk and Protective Factors for Alzheimer's Disease

Ron Zec, PhD, ABPN, ABPP (CN)

In this presentation, the risk and protective factors for dementia of the Alzheimer's type will be discussed, including the lifestyle habits linked to those factors, such as nutrition, exercise, sleep, stress control, accident prevention, toxin avoidance, cognitive stimulation and social support. Also included will be lessons learned from research on the longest-lived peoples. In addition, the putative underlying biological mechanisms for these factors and lifestyle behaviors will be discussed. The incidence and prevalence of AD doubles every 5 years after age 65. AD is projected to double or triple by the year 2050. However, if clinical AD can be delayed by 5 years, the incidence and prevalence would be decreased by 50%. It is thought that the neuropathological changes of AD begin 10 years or more before the first clinical symptoms. It is also now thought by some researchers that treatment strategies need to begin by middle age at the latest, in order to be effective. The "baby boom" generation, born between 1946 and 1964, is the generation that will largely account for the doubling or tripling of AD cases in the coming decades. The "baby boomers" are now middle aged and thus now is the time to implement lifestyle changes that might lower the risk of the later development of AD. Therefore, it is imperative that "baby boomers" be educated regarding the risk and protective factors and associated lifestyle habits that could decrease their risk for the development of dementia.

Following this session, attendees will be able to:

1. Outline the significant environmental risk and protection factors for Alzheimer's disease and related disorders.
2. Discuss the putative biological mechanisms for risk and protective factors.
3. Describe the components of a brain healthy lifestyle and what we have learned from the study of the longest lived peoples.

9:20 - 10:20 a.m.

Effects of Bilingualism on Cognitive Aging and Dementia

Fergus Craik, PhD, FRSC, FRS

Dr. Craik will review recent studies of the effects of bilingualism on aspects of cognitive function in healthy children, young and older adults, and in patients diagnosed with mild cognitive impairment (MCI) and Alzheimer's disease (AD). His Toronto studies have found that bilingualism is associated with an advantage in cognitive or attentional control functions, speculatively as a result of the need to monitor the two languages and exert inhibitory control over the non-selected language. In two studies it was found that bilingualism is associated with a 3-5 year delay in the onset of MCI and AD – a delay that is substantially longer than delays associated with current medications. Thus bilingualism may be one form of 'cognitive reserve' -- lifestyle factors that protect against the onset of dementia. Recent studies, including those at other centers, have found evidence for brain changes associated with bilingualism. Dr. Craik will include a summary of where this research effort stands, suggest lines of further enquiry and practical applications of findings.

Following this session, attendees will be able to:

1. Assess recent studies of the effects of bilingualism on healthy aging across the life span and explain brain changes associated with these effects.
2. Discuss recent studies on the effects of bilingualism on aging and dementia and share critical judgments on the topic.
3. Describe how the results of these studies might be applied in their own clinical settings.

Session Descriptions (con't)

10:35 - 11:35 a.m.

Physical Activity and Exercise: Implications for Healthy Brains and Minds

Arthur F. Kramer, PhD

Populations throughout the industrialized world are becoming increasingly sedentary as a result of the changing nature of work and leisure activities. As a result of these societal changes increases in diseases such as hypertension, diabetes, osteoporosis, and forms of cancer are increasing. Physical activity serves to reduce susceptibility to these diseases. However, increased physical activity also has direct and relatively rapid effects on cognition and brain health, as reported over the course of several decades, in animal studies of physical activity.

Dr. Kramer will review research conducted in his laboratory, and the field in general, which has examined the extent to which fitness training and physical activity enhances cognition, brain structure and function of older adults. The presentation will cover both cross-sectional and intervention studies of fitness differences and fitness and physical activity training. Studies which assess cognition via both behavioral measures and non-invasive neuroimaging measures, such as magnetic resonance imaging, functional magnetic resonance imaging, event-related brain potentials, and the event-related optical signal, will be discussed. Finally, the gaps in the human and animal literature on cognitive and brain health and the manner in which they can be addressed in future research will be explored.

Following this session, attendees will be able to:

1. Discuss state of the art research on exercise and physical activity on cognition.
2. Describe state of the art research on exercise and physical activity on brain function and structure.
3. Discuss state of the art research on exercise and physical activity for both individuals without pathology and those with age-associated neurodegenerative disorders.

1:00 - 2:00 p.m.

Biomarkers, Cognition and Cognitive Reserve in Alzheimer's Disease

Prashanthi Vemuri, PhD

Both CSF and imaging indicators of disease (biomarkers) that closely reflect the underlying pathology provide an independent measure of pathology based only on biology in contrast to clinical diagnosis done on the basis of clinical examination and neuropsychological tests. In the first part of the talk, we will discuss how different biomarkers could be used to measure different aspects of Alzheimer's disease (AD) pathology and how they can aid in answering several important questions – early diagnosis of AD; predicting the risk of future progression in mild cognitive impairment; differential diagnosis of dementia sub-types; measuring the efficacy of therapeutics and providing mechanistic inferences into the disease process. In the second part of her talk, Dr. Vemuri will talk about the concept of cognitive reserve and how it affects the relationship between biomarkers and cognition. Cognitive reserve is the term often used to explain why about 30% of cognitively normal subjects with AD pathology do not show any cognitive symptoms. Included will be findings from the Mayo Clinic Study of Aging.

Following this session, attendees will be able to:

1. Discuss the role of biomarkers in Alzheimer's disease.
2. Describe the concept of cognitive reserve.
3. Explain the effect of cognitive reserve on Alzheimer's disease biomarkers.

Session Descriptions (con't)

2:15 - 3:15 p.m.

Mediators of Brain (Type 3) Diabetes: Contributions of Lifestyles, Genes, and Aging to Alzheimer's Disease Pathogenesis

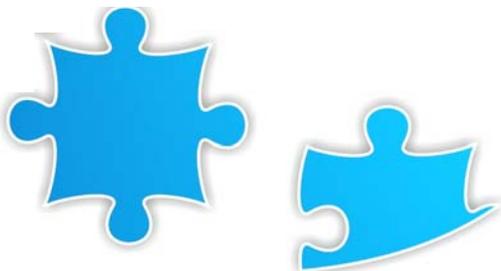
Suzanne M. de la Monte, MD, MPH

Alzheimer's disease (AD) is the most common cause of dementia in North America. Despite 30+ years of intensive research, gaps remain in our understanding of AD pathogenesis and approaches to treatment. However, the recent rapid shift to a paradigm that focuses on the roles of metabolic dysfunction and insulin and insulin-like growth factor (IGF) resistance as causal agents of cognitive impairment and neurodegeneration, holds promise.

The overarching hypothesis, that AD is a brain diabetes (Type 3), accounts for the impairments in neuronal survival, myelin maintenance, energy metabolism, synaptic integrity, and plasticity, and the well-recognized neuropathological processes including, tau hyper-phosphorylation, amyloid-beta (APP β -A β) accumulation, oxidative and endoplasmic reticulum stress, and cerebral microvascular disease. Growing evidence suggests that the current AD epidemic is linked to combined effects of aging, lifestyle choices, peripheral insulin resistance diseases, including obesity, type 2 diabetes mellitus, non-alcoholic fatty liver disease, and metabolic syndrome, nitrosamine exposures, and familial/genetic factors as mediators of brain diabetes, cognitive impairment, and neurodegeneration. Experimental data suggest that neurodegeneration can be initiated and propagated by the buildup of agents consequential to peripheral insulin resistance, i.e. toxic lipids (ceramides), and predicts that toxic ceramides generated in liver or visceral fat, cross the blood-brain barrier and cause brain insulin resistance, stress, and inflammation. This extrinsic mechanism of neurodegeneration accounts for the strikingly concurrent and overlapping increases in prevalence of all insulin resistance diseases. Yet, there is evidence that AD/Type 3 diabetes occurs as the dominant or only manifestation of insulin resistance. The predicted intrinsic pathway of neurodegeneration is nearly identical to the extrinsic pathway, except its underlying basis is direct metabolic injury to the brain. Familial AD-associated mutations and gene variants accelerate the trajectory to brain insulin resistance with aging. Treatment strategies will likely require multi-pronged approaches to tackle brain insulin resistance and its consequences, which themselves cause injury.

Following this session, attendees will be able to:

1. Explain the role of insulin resistance and neurodegeneration.
2. Discuss the causes of brain insulin resistance.
3. Describe therapeutic approaches for brain insulin resistance in neurodegeneration



About the Presenters

Fergus Craik, PhD, FRSC, FRS, obtained his B.Sc. from the University of Edinburgh in 1960, and his PhD in psychology from the University of Liverpool in 1965. He was on the faculty of Birkbeck College, University of London from 1965 – 1971 before moving to the University of Toronto in 1971, where he was a faculty member until he retired in 2000. He chaired the Department of Psychology at Toronto from 1985 – 1990 and was appointed University Professor in 1997. He has been associated with the Rotman Research Institute of Baycrest in Toronto since 1988, and was appointed Senior Scientist at that institute in 2000. Dr. Craik's research work involves the experimental study of human memory processes; other interests are cognitive aging, and the effects of bilingualism on cognitive functions in health and disease. Dr. Craik held the Glassman Chair in Neuropsychology and Aging from 1996 – 2000; he received honorary doctorates from the University of Bordeaux 2 in 2006, and from the University of Edinburgh in 2012. He is a Fellow of the Royal Societies of Canada (FRSC) and of London (FRS), and in 2000 was one of four Canadians awarded the Killam Prize for Science.

Suzanne M. de la Monte, MD, MPH, received her undergraduate degree from Cornell University, MD from Cornell University Medical College, and MPH from The Johns Hopkins Bloomberg School of Public Health. She completed an Anatomic Pathology residency at Johns Hopkins Hospital, and Neuropathology fellowship at the Massachusetts General Hospital/Harvard Medical School. She developed her academic career in basic and translational research working at the Mass General, and in 2000, she joined the faculty at Rhode Island Hospital and the Alpert Medical School of Brown University, where she is currently Professor of Pathology (Division of Neuropathology), Neurosurgery, and Neurology, and holds an appointment in the Dept. of Medicine. Dr. de la Monte's research is supported by several grants from the NIH. Her major research efforts are focused on mechanisms and consequences of brain insulin resistance, particularly in relation to neurodegeneration. Her research helped lead to the novel concept that Alzheimer's is a form of brain diabetes. Apart from her research, Dr. de la Monte directs courses in molecular neuroscience, neuropathology, and research methodology, and serves on a number of academic committees at Brown and the Rhode Island Hospital.

Arthur F. Kramer, PhD, is the Director of the Beckman Institute for Advanced Science & Technology and the Swanlund Chair and Professor of Psychology and Neuroscience at the University of Illinois. He received his Ph.D. in Cognitive/Experimental Psychology from the University of Illinois in 1984. He holds appointments in the Department of Psychology, Neuroscience program, and the Beckman Institute. Professor Kramer's research projects include topics in Cognitive Psychology, Cognitive Neuroscience, Aging, and Human Factors. A major focus of his labs recent research is the understanding and enhancement of cognitive and neural plasticity across the lifespan. He is a former Associate Editor of Perception and Psychophysics and is currently a member of six editorial boards. Professor Kramer is also a fellow of the American Psychological Association, American Psychological Society, a former member of the executive committee of the International Society of Attention and Performance, and a recent recipient of a NIH Ten Year MERIT Award. Professor Kramer's research has been featured in a long list of print, radio and electronic media including the New York Times, Wall Street Journal, Washington Post, Chicago Tribune, CBS Evening News, Today Show, NPR and Saturday Night Live.

About the Presenters (con't)

Prashanthi Vemuri, PhD, Dr. Vemuri is an Assistant Professor at the Aging and Dementia Imaging Laboratory, Department of Radiology, Mayo Clinic Rochester. She has a Masters and Doctorate from the Department of Electrical Engineering at University of Utah, Salt Lake City with a major in Medical Imaging. She completed a fellowship with Dr. Clifford Jack at the Mayo Clinic in imaging of neurodegenerative diseases. She is a recipient of the NIH K99/R00 Pathway to Independence grant from the NIA, Alzheimer's Association New Investigator grant award and was recently awarded the AFAR-GE healthcare junior investigator award for excellence in aging and imaging research. Dr. Vemuri's areas of research are developing and validating biomarkers to improve the understanding and management of Alzheimer's disease and related disorders and utilize biomarkers to improve our understanding of cognitive reserve, i.e. the disconnect between pathology and cognitive performance in individuals.

Ron Zec, PhD, is a Fellow in the National Academy of Neuropsychology, and a former Senior Staff Fellow at the National Institute of Mental Health. He is board certified by the American Board of Clinical Neuropsychology (ABCN), the American Board of Professional Psychology (ABPP) and the American Board of Professional Neuropsychology (ABPN). Dr. Zec has a B.A. from Rutgers University and an M.A. and Ph.D. from the University of Kansas. He has made numerous presentations at national and international scientific meetings and has published extensively in his field. Dr. Zec currently serves as an Associate Professor at Southern Illinois University School of Medicine where he has been a faculty member since 1984. He teaches in the Departments of Psychiatry and Neurology, and is on the faculty of the Center for Alzheimer's Disease and Related Disorders. His research concentrates on the neuropsychology of aging, Alzheimer's disease, and other disorders associated with cognitive impairment, including severe closed head injury, Parkinson's disease, depression, and schizophrenia. Dr. Zec maintains a busy clinical neuropsychological practice.



Continuing Education

To receive continuing education credit or a certificate of attendance, sign in at the Continuing Education desk before 2:15 p.m.

Accreditation

The SIU School of Medicine is accredited by the Accreditation Council for Continuing Medical Education to provide continuing medical education for physicians.

Physicians

The SIU School of Medicine designates this live activity for a maximum of 6.25 *AMA PRA Category 1 credits*[™]. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

Physician Assistants

American Academy of Physician Assistants (AAPA) accepts certificates of participation for educational activities certified for *AMA PRA Category 1 Credit*[™] from organizations accredited by the ACCME. Physician assistants may receive a maximum of 6.25 hours of Category 1 credit for completing this program.

Nurses

SIU School of Medicine is preapproved as a continuing nursing education provider pursuant to Section 1300.130, subsection c), 1), B) and P) of the Illinois Department of Financial and Professional Regulation Nurse Practice Act. Nurses may receive a maximum of 6.25 contact hours for completing this activity.

Counselors/Clinical Counselors

Nursing Home Administrators

Social Workers

SIU School of Medicine is a licensed provider for continuing education for nursing home administrators (6.25 hours), social workers (6.25 hours) and professional counselors/clinical counselors (6.25 hours).

General Certificate of Attendance

A general Certificate of Attendance/Participation for 6.25 hours will be available.

Conference Planning Committee

Tom Ala, MD, SIU School of Medicine, Springfield, IL
Sandy Burgener, PhD, University of Illinois School of Nursing, Urbana, IL
Greg Kyrouac, MEd, SIU School of Medicine, Springfield, IL
Maggie Schaver, MPA, SIU School of Medicine, Springfield, IL
Ron Zec, PhD, SIU School of Medicine, Springfield, IL

Conference Information

Who Should Attend

This program is designed for clinicians, researchers and other professionals in wellness, health-care and aging. This includes physicians, physician assistants, nurse practitioners, nurses and others in internal medicine, neurology, psychiatry, gerontology, and family practice, as well as social workers, counselors, administrators and interested others.

Registration

Register on or before April 30th and receive the discounted early-bird rate. There are two options for registration: Register online with credit card payment or complete a registration form and mail with payment. Registration confirmation will be sent electronically to those who provide email addresses (preferred). Other registrants will be mailed confirmations within two weeks or as time allows.

Registration fees include light continental breakfast, lunch, conference materials, and continuing education credit as applicable.

Cancellation Policy

Registrants who must cancel may receive a refund, less a \$25 processing fee. Refunds must be requested within two days after the conference by calling the Conference Registrar, Office of CME, at 217.545.7711.

Special Assistance

SIU School of Medicine strives to assure that its activities are accessible to all. The conference venue is fully accessible. Additionally, if you need any of the services identified in the Americans with Disabilities Act, please contact us at 217.545.7711 at least 10 days in advance.

Disclosure Policy

It is the policy of SIU School of Medicine to ensure balance, independence, objectivity and scientific rigor in all our educational programs. All participating faculty are requested to disclose to the program audience, any real or apparent conflict of interest related to the content of their presentation.

Conference Location

The conference location is the James T. Dove, MD Conference Center, located in the Prairie Heart Institute (PHI), 619 E. Mason, Springfield, Illinois. Complimentary parking is available in the Mason Street parking ramp directly across from the PHI main entrance.

Overnight Accommodations

A limited number of guest rooms has been reserved for the evening of May 20, 2013 at the President Abraham Lincoln Hotel, 701 East Adams, Springfield, IL. The hotel is newly renovated and is located in historic downtown Springfield, approximately 2 blocks from the conference venue. A special rate of \$70 per single and \$85.00 per double room, plus tax, is available for this conference (May 20 & 21 as available). To receive this rate you must make reservations by April 29, 2013 and request the "Healthy Brain/SIU Alzheimer's" conference group rate. Hotel Reservations: 866-788-1860. www.palhacc.com

Information

Registration: Judy Harbison, 217.545.7711 or jharbison@siumed.edu.

Program & Exhibit Opportunities: Maggie Schaver, 217.545.7193 or CADRDevents@siumed.edu.

Registration

ONLINE: www.siumed.edu/cme (go to "CME Calendar/Registration")

**CONFERENCE
REGISTRAR
217.545.7711**

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P.O. Box 19602, Springfield, Illinois 62794-9602

Name _____
(as you wish it to appear on name badge)

Credentials: PHD MD DO PA NP RN SW NHA Counselor Other _____

Mailing Address - Street _____

City _____ State _____ Zip _____

This is my: Home Address Business Address

Organization/Affiliation (if applicable): _____

Daytime Phone: () _____ Email: _____

I will attend lunch: Yes No Vegetarian requested

Check appropriate category/rate.	Early Bird Rate on or before April 30	Regular Rate after April 30
Physician	<input type="checkbox"/> \$95	<input type="checkbox"/> \$110
Other Professional or General Public	<input type="checkbox"/> \$50	<input type="checkbox"/> \$65
SIU School of Medicine (check type & rate) <input type="checkbox"/> Full time Faculty or Staff <input type="checkbox"/> Resident or Fellow <input type="checkbox"/> CADRD Memory & Aging Network provider	<input type="checkbox"/> \$25	<input type="checkbox"/> \$40
SIU School of Medicine Student	<input type="checkbox"/> waived	<input type="checkbox"/> \$25

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Check (payable to SIU School of Medicine)
 MasterCard Visa Discover **Amount \$** _____

Account # _____ Exp. Date _____ 3-digit security code _____

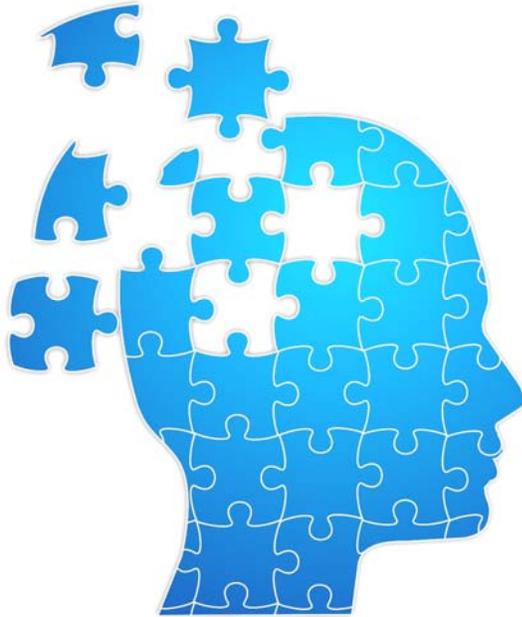
Name (print as it appears on card) Signature

Cancellations

Refunds are available by calling the Conference Registrar on or before May 23, 2013. \$25 processing fee applies.
217.545.7711

Healthy Brain Aging: A Community Education Program

Attention Baby Boomers! Learn what we all need to know about reducing risk for Alzheimer's disease and other dementias.



Wednesday,
May 29, 2013

6:00 - 7:30 p.m.

James T. Dove, MD Conference Center
Prairie Heart Institute
619 E. Mason Street
Springfield, IL

SIU School of Medicine faculty will answer these questions and more:

- What was learned at the SIU School of Medicine scientific conference on Healthy Brain Aging (May 21, 2013)?
- Is there anything we can do to reduce our risk for developing Alzheimer's disease?
- What is really known about diet, exercise, social and mental activities and risk for dementia?
- Are there medical conditions that are linked to increased risk for dementia?

Brought to you by:

 **SIU School of Medicine**

*Center for Alzheimer's Disease
and Related Disorders*

Free and open to the public.

Registration not required.

Inquiries:

(217) 545-7181

CADRDevents@siumed.edu

www.siumed.edu/alz