Thank you for making FY 2018-2019 another remarkable year for the MUSC Center on Aging! This year marked another successful year of service, outreach, and research for the Center, as laid out in our annual report. This annual report is a true testament to the commitment and compassion of MUSC, the Executive Committee, and our community partners.

A few highlights from this year:

• Hosted our 3rd Annual Senior Expo for seniors, family members, and caregivers in North Charleston, SC. Over 500 participants enjoyed free clinical screenings, exercise demos, and learning about community resources available to our senior population.
• Sponsored and chaired the 3rd annual Meals on Wheels Holiday Harvest Gala, in which $17,000 was raised to benefit over 200 seniors in need of warm and healthy meals.
• Continued our support of aging-related research by providing pilot funds for three research projects being conducted at MUSC.
• Provided the necessary expertise and resources for participation in community education events, such as the City of Charleston Lunch and Learn Series, and the Ending Elder Abuse in Later Life Project. Center on Aging participation in these events are vital to provide geriatric awareness and education to our community.

As you will see, the Center on Aging is flourishing and we look to continue to grow within the MUSC and greater Charleston communities for years to come to continue our mission of improving the health, longevity, and quality of life of our SC seniors.

Overview

The Center on Aging (CoA) is a research, service, and education center at the Medical University of South Carolina. Dr. Heather Boger was appointed by the Provost as Interim Director in July 2016. Dr. Boger and her team are committed to executing the Center on Aging’s strategic plan to promote health, longevity and improving the quality of life for South Carolina’s seniors.

Strategic Goals

• To serve as the center for interdisciplinary aging research and education across all colleges within MUSC.
• To optimize current and new technology and innovations for older adults in South Carolina.
• To promote communication and interaction with local and state-wide organizations to improve healthcare access and research in the field of aging.
• To cultivate public and private partnerships to expand collaborative and entrepreneurial efforts in aging services.
• To connect the MUSC community of students, researchers, and practitioners.

Staff

Kelly Franklin
Administrative Coordinator
Public Relations Chair, Lowcountry Senior Network
MUSC is dedicated to engaging community members in all aspects of the research process to promote health, reduce the risk of illness and disease, and build community resilience to help transform health care.

### Aging interests at MUSC and beyond

#### CoA EDUCATION

- Organize interprofessional symposiums around age-related topics and concerns.
- Initiate interprofessional, collaborative opportunities across all MUSC colleges.
- Expand geriatric education.
- Support volunteer opportunities for MUSC students in the field of senior services.

#### CoA RESEARCH

- Strengthen the network of aging research and healthcare at MUSC.
- Establish interdisciplinary relationships with research teams at MUSC in conjunction with community partners.
- Develop a world-class aging center to generate innovative research.
- Create career development opportunities for young and mid-career faculty in areas of aging under the guidance of academic leaders.
- Collect community feedback to address need and explore various funding opportunities.

#### CoA SERVICE

- Host age-related symposiums for the local and state community.
- Conduct active, hands-on workshops to address the concerns of the community seniors.
- Serve as a trusted resource for information related to aging research, education, and healthcare.
- Expand education and outreach for community programs.
- Curate a list of expert speakers to educate the community.

---

## CoA Executive Committee

- **Vanessa Hinson, MD, PhD**
  - CoA Deputy Director
  - Professor
  - College of Medicine
  - Department of Neurology
  - Director of Movement Disorders

- **Annie Simpson, PhD**
  - CoA Deputy Director
  - Associate Professor
  - College of Health Professions
  - Department of Healthcare Leadership and Management

- **Federica del Monte, MD, PhD**
  - Associate Professor
  - College of Medicine
  - Division of Cardiology

- **Addie Middleton, PhD, DPT**
  - Assistant Professor
  - College of Health Professions
  - Division of Physical Therapy

- **Katie Deerin**
  - Affiliations Coordinator
  - Senior Living and Non-acute Care

- **Mary Catherine Dubois**
  - Social Worker
  - Palliative Care Program

- **Mark Newbrough, MD**
  - Associate Professor
  - College of Medicine
  - Division of Internal Medicine

- **Amanda Overstreet, DO**
  - Assistant Professor
  - College of Medicine
  - Division of Internal Medicine

- **Chris Gregory, PhD**
  - Associate Professor
  - College of Health Professions
  - Department of Health Sciences and Research

- **Kathryn Van Ravenstein, APRN, PhD, FNP-BC**
  - Assistant Professor
  - College of Nursing
  - Office of Academic Affairs
Center on Aging: Education

City of North Charleston Lunch and Learn Speaker Series
Ongoing
The CoA partnered with the City of North Charleston Mayor’s Office to arrange MUSC speakers for their 2018-19 Lunch and Learn Series for the Senior Center at Dorchester Road and the Senior Center at Northwood.

August 8, 2018 – Advanced Care Planning
Mary Catherine Dubois

September 12, 2018 – Mild Cognitive Impairment
Dr. Anya Benitez

October 10, 2018 – Nutrition for Caregivers
Dr. Elaine Amella

November 14, 2018 – Yoga Breathing
Dr. Sander Balsubramanian

December 12, 2018 – Dental Health
Dr. Joni Nelson

February 13, 2019 – Heart Disease
Dr. Katie Muscella

March 13, 2019 – Hearing and Aging
Lois Matthews

April 10, 2019 – MUSC Urban Farming
Carmen Ketron

May 8, 2019 – Human Brain Presentation
Dr. Heather Boger

June 12, 2019 – Senior Mentor Program
Dr. Heather Boger

Dorchester County Senior Lifestyle Fair
August 31, 2018
The Lieutenant Governor’s Office on Aging joined Dorchester Seniors with speakers from different agencies to provide program topics such as fire safety, senior scams, etc. There were also tables from local exhibitors and lunch for Dorchester Senior members.

NY Times featured the MUSC Senior Mentor Program
October 12, 2018
The MUSC Senior Mentor Program was referenced in The New York Times article, “Every Older Patient Has a Story. Medical Students Need to Hear It” by Paula Span for its value in preparing young physicians to care for an aging population. https://tinyurl.com/y4d5bpbw

MUSC Living with Parkinson’s Disease Symposium
November 10, 2018
A symposium for patients and families living with Parkinson’s Disease. Educational sessions will be led by members of the MUSC Health Movement Disorders Program team and invited guest speakers, including Dr. Vanessa Hinson.

Health Focus: Aging in Place Interview
November 20, 2018
Bobbi Coneer interviewed Dr. Heather Boger about aging in place on the Health Focus - a production of the Medical University of South Carolina in partnership with South Carolina Public Radio.

Geriatric Fellowship Program
November 27, 2018
Under the leadership of Dr. Mark Newbrough, the new Geriatric Medicine Fellowship program is a foundational building block for the institution’s plan to grow and develop a sustainable geriatrics workforce. This one-year fellowship program provides trainees with in-depth experiences that cover the full spectrum of patients, problems, and settings that geriatricians are likely to encounter across a variety of clinical settings. Upon successful completion of the program, fellows may take the American Board of Internal Medicine Geriatric Medicine Certification Exam.

Human Brain Presentation for Respite Care Charleston
December 12, 2018
Dr. Heather Boger spoke about brain health with Alzheimer’s patients and their caregivers.

Human Brain Presentation for Daniel Point
January 12, 2019
Dr. Heather Boger spoke about brain health with residents of Daniel Point retirement community.

Franke at Seaside Alzheimer’s Panel of Experts
February 26, 2019
Dr. Heather Boger participated on the Franke at Seaside Alzheimer’s Panel of Experts to answer audience questions from residents and caregivers on the latest in research related to Alzheimer’s disease and dementia.

Senior Mentor Program Presentation at Somerby
May 31, 2019
Dr. Heather Boger introduced Somerby residents to the MUSC Senior Mentor Program and recruited new volunteers.

MUSC Stroke Caregivers Summit
June 8, 2019
Dr. Addie Middleton spoke to attendees at the MUSC Stroke Caregivers Summit and distributed information program information.

World Elder Abuse Awareness Day Resource Fair
June 15, 2019
The CoA planned and promoted Elder Abuse Awareness Panel in conjunction with the College of Nursing Elder Abuse Prevention and Treatment Program and World Elder Abuse Awareness Day.

Podcast Interview
January 25, 2019
Kelly Franklin was interviewed about the Center on Aging initiatives for the Medicare Savings LLC podcast.

Franke at Seaside Alzheimer’s Panel of Experts
February 26, 2019
Dr. Heather Boger participated on the Franke at Seaside Alzheimer’s Panel of Experts to answer audience questions from residents and caregivers on the latest in research related to Alzheimer’s disease and dementia.

Senior Mentor Program Presentation at Somerby
May 31, 2019
Dr. Heather Boger introduced Somerby residents to the MUSC Senior Mentor Program and recruited new volunteers.

MUSC Stroke Caregivers Summit
June 8, 2019
Dr. Addie Middleton spoke to attendees at the MUSC Stroke Caregivers Summit and distributed information program information.

World Elder Abuse Awareness Day Resource Fair
June 15, 2019
The CoA planned and promoted Elder Abuse Awareness Panel in conjunction with the College of Nursing Elder Abuse Prevention and Treatment Program and World Elder Abuse Awareness Day.
Primary Aim 2: To determine the impact of glottal gap size on the response to RMST. The main goal of this pilot study is to acquire data to strengthen our NIH grant proposal for a larger clinical trial. Aim 1a: To determine which intervention is effective for patients with presbyphonia, to establish sample size calculation for future studies. Aim 1b: To determine what effect sizes are to be expected within and between the IMST, EMST, and VE groups.

Primary Aim 3: To determine the impact of annual review on patient adherence and outcomes analysis. The study revealed that inhibition of NFAM1 modulates cytokines that regulate osteoclast formation. NFAM1 knockdown also alters AP-1 signaling and TRAP expression during osteoclast differentiation. Furthermore, NFAM1 inhibition suppresses RANKL and vitamin D3 hypersensitivity of preosteoclast cells. The study revealed that inhibition of NFAM1 stimulation of osteoclast differentiation in Paget’s disease of bone. Sakamuri Reddy, MD

The study revealed that inhibition of NFAM1 modulates cytokines that regulate osteoclast formation. NFAM1 knockdown also alters AP-1 signaling and TRAP expression during osteoclast differentiation. Furthermore, NFAM1 inhibition suppresses RANKL and vitamin D3 hypersensitivity of preosteoclast cells. The study revealed that inhibition of NFAM1 stimulation of osteoclast differentiation in Paget’s disease of bone. Sakamuri Reddy, MD

Transcutaneous auricular Vagal Nerve Stimulation (taVNS) in mild to moderate Parkinson’s Disease (PD)
Vanessa Hinson, MD, PhD

Parkinson’s disease affects approximately 1 in 100 people over age 65. Unfortunately, existing treatment strategies for PD are purely symptomatic and incompletely address symptoms, often with intolerable side effects. Recent MUSC, neuroscience laboratory pre-clinical studies indicate potential for symptomatic as well as disease modifying benefit of vagal nerve stimulation (VNS) in PD. Our collaborators have conducted safety, tolerability, and feasibility trials of taVNS and tested optimal stimulation parameters that mimic cervical implanted VNS in both parasympathetic response and brain effects. taVNS in PD is a 2-week, randomized, sham controlled, double blind trial of taVNS effects on motor symptoms in patients with mild to moderate PD. Recruitment goal is 30 patients (15 active taVNS and 15 sham stimulation) to undergo 10 days of 1-hour stimulation session (5 days treatment, 2 days off, 5 days treatment). Non-invasive electrical stimulation to the auricular branch of the vagus nerve is given at 200% perceptual threshold, 500 s pulse width, 25Hz for 60s ON, 30s OFF cycles, with replicated sham stimulation on the earlobe. Primary outcome measure is the videotaped pre and post stimulation modified MDS-UPDRS part III (baseline/ mid-point/completion) in OFF PD medication state with rater blinded to group/condition. Secondary outcome measures include non-motor PD symptom scale, full MDS-UPDRS, multiple cognition and behavioral domains pertinent to PD, serum monitoring of BDNF, TNF-alpha, and IL-6, as well as taVNS safety and tolerability assessment in PD patients. Study includes an exploratory global composite of motor and cognition outcomes analysis.

Milestones reached:
1. Protocol finalized
3. Procurement of equipment
4. Start of patient screening procedures 8/2018
5. First patient enrolled 10/1/2018
6. Number of patients enrolled: 15
7. Number of patients completed: 14
8. Interim analysis on first 8 patients performed (see below)
9. No cost extension requested from COA to complete study over next 12m

Adverse events: none to date
Interim analysis shows 8/8 randomized PD patients completed the study. The study is ongoing to complete the anticipated 30 subjects. taVNS/sham procedure was feasible and well tolerated with no clinically meaningful changes in HR or BP. Preliminary analysis of modified MDS-UPDRS part III scores at baseline (mean active group: 24; mean sham group 22) and after 10 days of stimulation (mean active group: 21; mean sham group 21) suggests a small but clinically meaningful benefit. A large effect was observed for reduction of self-reported ADHSD symptoms, and small effect observed for improvement of self-reported applied cognition in the active taVNS group compared to sham.

Barriers to success:
Slower than expected pace of recruitment, availability of exam rooms at our research office, and availability of coordinator time have been barriers to the throughput of this study thus far.

Possible solutions:
Brain Stimulation Lab has offered to lend RA to help with throughput. We are training this person now.

Publications:
Abstract: “Design of a novel pilot trial of Transauricular Vagal Nerve Stimulation in Parkinson’s Disease” Presented at:
1) Parkinson’s Study Group 32nd Annual Symposium on the Etiology, Pathogenesis, and Treatment of Parkinson Disease and Other Movement Disorders.
2) Parkinson’s Foundation 2019 Centers of Excellence Leadership Conference

Follow-up grants:
Should we establish safety and obtain a signal for efficacy, will seek further funding for multi-center study from MJF versus NIH and engage PSG. Had discussion with PSG leadership confidentially on this topic on 9/7/19 at PSG meeting.

NFAM1 stimulation of osteoclast differentiation in Paget’s disease of bone
Sakamuri Reddy, MD

The study revealed that inhibition of NFAM1 modulates cytokines that regulate osteoclast formation. NFAM1 knockdown also alters AP-1 signaling and TRAP expression during osteoclast differentiation. Furthermore, NFAM1 inhibition suppresses RANKL and vitamin D3 hypersensitivity of preosteoclast cells.

Scientific Presentations

Publication
• Purushoth Ethiraj, Anna Alford, Brandon Wright, Allie M. Ottinger, Jessica Hathaway-Schrader, Reddy SV. NFAM1 knockdown modulates osteoclast differentiation. (Manuscript under preparation)
MUSC Student Research Day
November 1, 2018
Each year, on the first Friday in November, MUSC holds its annual Perry V. Halushka Research Day (RD). RD is run like a major meeting and gives presenters a chance to practice delivering oral or poster presentations in a “safe” environment. MUSC RD is open to all undergraduates (high school, college), students in all six colleges, postdoctoral fellows, clinical fellows and residents, as well as staff scientists and research specialists who performed research in the year leading up to RD. The Center on Aging offered an award for student abstracts with a focus on aging research and selected the following recipients out of over 30 applicants:

1st Place James Dias
“Age-Related Spatial Hearing Difficulty Predicted by the White-Matter Integrity of the Auditory ‘Where’ Pathway”

2nd Place (Tie) Ahmed ElMansi
“DPP-4-Cleaved SDF-1β Diminishes Migration and Osteogenic Differentiation Capacities of Bone Marrow Mesenchymal Stem Cells”

2nd Place (Tie) Kaitlin Cassidy
“Factors affecting health status in community-residing older adults in low-income communities in the tri-county area: A qualitative study”

South Carolina Alzheimer’s Research Conference
November 9, 2018
The Alzheimer’s Association organized this event to gather national and local experts to speak about the latest scientific findings on AD detection and treatment. Kelly Franklin participated with community members to educate on the CoA’s role at MUSC. Dr. Steve Carroll presented about the Carroll A. Campbell, Jr. Neuropathology Laboratory and Andreana Benitez discussed Early Detection of Alzheimer’s Disease Using Brain Imaging.

MUSC Science Cafe
April 23, 2019
Dr. Heather Boger presented at the Science Cafe series to discuss brain health and the latest research to improve our quality of aging.

South Carolina State Aging Hearing
April 24, 2019
The South Carolina Advisory Council on Aging scheduled a meeting to hear comments and presentations by Aging Network stakeholders. Dr. Heather Boger attended and represented the MUSC Center on Aging and detailed the center’s mission and strategic goals.

Research Study Recruitment and Promotion
Ongoing
Hearing Research Program
Project Quit
Alzheimer’s Imaging Study

“Youth is a gift of nature, but AGE is a work of art.”
- Stainslaw Jerzy Lec
Alzheimer’s Association Walk to End Alzheimer’s  
September 15, 2018  
The CoA compiled a team of walkers to raise money for the SC Alzheimer’s Association and gathered at North Charleston Waterfront Park to raise awareness for the disease.

More Good Days Art Gala and Silent Auction  
October 25, 2018  
Provided planning and promotional support for the Respite Care Charleston More Good Days Art Gala and Silent Auction. RCC provides day programs to those with Alzheimer’s and related dementias to provide respite for their caregivers.

Lowcountry Senior Network Angel Tree  
November 13, 2018  
Kelly Franklin chaired the Angel Tree Program that provided personal gifts for the holidays to nearly 70 seniors in need from seven area senior centers.

3rd Annual Holiday Harvest Gala  
November 29, 2018  
The CoA sponsored and Kelly Franklin chaired the 3rd Annual Holiday Harvest Gala to support Charleston Meals on Wheels through the Lowcountry Senior Network. This event raised nearly $17k to directly benefit the over 200 individuals on the waiting list to receive Meals on Wheels services in Charleston. Over the last 3 years this event has raised over $42k, bringing meals to hundreds of previously unserved homebound seniors.

Lowcountry Senior Network Food Drive  
March 12, 2019  
Supported the LSN Public Relations committee’s project to collect food to be delivered to underserved seniors in the St. John’s community.

Putting for Parkinson’s  
April 27, 2019  
The Annual Coach Putting for Parkinson’s event was started in 2009 to raise awareness of Parkinson’s and to help fund research for Parkinson’s in honor of Coach Tim Touchberry.

Moving Day  
May 18, 2019  
Moving Day is the Parkinson’s Foundation’s annual fundraising walk event. It is a fun and inspiring fundraising event that unites families, friends and communities both large and small in the fight against Parkinson’s disease. This celebration of movement featured a family friendly walk course, a kids area, a caregivers relaxation tent and a special Movement Pavilion featuring yoga, dance, Tai Chi, Pilates, etc. all proven to help manage the symptoms of PD.

Lowcountry Senior Network Cleaning Drive  
June 11, 2019  
Supported the LSN Public Relations committee’s project to collect household cleaning supplies and personal hygiene products for underserved seniors at local senior centers.

Community Impact: Service

Organizations promoted
- Agape Hospice
- Alzheimer’s Association
- Bridges for End-of-Life
- CARTA
- Charleston Area Senior Center - Meals on Wheels
- Daniel Pointe Retirement Community
- Dorchester Seniors
- Fox Rehab
- Franke at Seaside
- Franklin and Associates
- Harleston Neighbor to Neighbor
- Louis Waring Jr. Senior Center
- Lowcountry Food Bank
- MUSC CARES Clinic
- MUSC College of Graduate Studies
- MUSC College of Health Professions
- MUSC College of Medicine
- MUSC Elder Abuse Training and Treatment Program
- MUSC Geriatrics
- MUSC Health Charleston Health and Wellness Expo
- MUSC Health Orthopedics
- MUSC Health Primary Care
- MUSC Health Vision Center
- MUSC Hollings Cancer Center
- MUSC Movement Disorders Clinic
- MUSC Palliative Care
- MUSC Project Quit
- MUSC Research Day
- MUSC Science Café
- MUSC Senior Mentor Program
- MUSC Stroke Recovery Research Program
- MUSC Urban Farm
- Parkinson’s Foundation
- Respite Care Charleston
- The ARK
- Trident Area Agency on Aging
- Wellmore of Daniel Island

Topics
- Aging in Place
- Alzheimer’s disease and other dementia
- Bladder health
- Cancer
- Caregiver support
- Cellular Therapy
- Chronic Liver disease
- Clinical trials
- Cognitive health
- Depression
- Elder Abuse
- End of life
- Fall risk
- Fitness
- Healthcare decisions
- Hearing loss
- Heart health
- High Blood Pressure
- Hip and knee replacements
- Home Safety
- Hunger
- Hurricane preparedness
- Immunizations
- Long-term care
- Lupus
- Memory
- Menopause
- Nutrition
- Opioid addiction
- Palliative care
- Prescription drugs
- Research
- Self care
- Stroke
- Telehealth
- Translational geriscience
- Yogic breathing

Media coverage:
- Lowcountry Live
- Let’s Talk Boomers
- WTNAT Fox 24
- SC Public radio
- LTC University podcast
- All About Seniors
- WCBD News 2
- The New York Times
- The Post and Courier
This was the first year hosting the event at the North Charleston Convention Center and attendance grew to nearly 500 people. Whether guests were interested in taking advantage of free health screenings, or wanted to learn about long term care planning, there were experts on site to help with all of their questions.

With over 100 exhibitors, including non-profit organizations and a wide assortment of local vendors and service providers, guests had the opportunity to get information on not only their health questions, but also local and state resources on housing, equipment, insurance, home care, real estate, and so much more.

MUSC offered free blood pressure and glucose checks, bone density screenings, fall risk and mobility assessments, and more.

Live fitness and dance presentations were a big hit this year and got everyone moving. The Mt. Pleasant Police Department was on site with a prescription drug take back station for guests to safely dispose of unwanted prescription drugs.

Platinum Sponsors: Absolute Total Care, Bintelli Powersports, and Overture 55+ Active Adult Apartment Homes

The next Senior Expo will be held at the North Charleston Convention Center on March 19, 2020.
THE MEDICAL UNIVERSITY OF SOUTH CAROLINA

Founded in 1824 in Charleston, The Medical University of South Carolina is the oldest medical school in the South. Today, MUSC continues the tradition of excellence in education, research, and patient care. MUSC educates and trains more than 3,000 students and residents, and has nearly 13,000 employees, including approximately 1,500 faculty members.

The Center on Aging is a research, service, and education center at the Medical University of South Carolina. The center was approved by the South Carolina Commission on Higher Education December 3, 1987, giving it the status of the oldest research center at the University.

Under the leadership of Interim Director, Dr. Heather Boger, the Center on Aging is committed promoting health, longevity and improving the quality of life for South Carolina’s seniors.