

NIH Centers of Excellence

Claude D. Pepper Older Americans Independence Centers

Overview

Why the OAICs Were Established

In 1955, the U.S. Surgeon General established five Geriatric Research and Training Centers to advance research on the health care problems of the elderly and to train future academic leaders in geriatrics. In 1989, Congress enacted legislation that redesignated the Geriatric Research and Training Centers as the Claude D. Pepper Older Americans Independence Centers (OAICs), in honor of former Florida Senator and Representative Claude Denson Pepper for his efforts to promote the health and well-being of older Americans. Section 445A of the Public Health Service Act (42 U.S.C. 285e-3) authorizes the OAICs, which NIH funds for 5-year periods, to increase scientific knowledge leading to better ways to maintain or restore independence in older adults (see Table 4-2).

How OAICs Function within the NIH Framework

NIH funding for the OAICs comes from NIA through a center grant mechanism (P30). The ultimate goal of the OAIC program is to translate research on aging to applications and interventions that increase or maintain independence for older persons. NIH currently funds 30 ADCs (see Table 4-1).

As Centers of Excellence in geriatrics research and training, the OAICs provide intellectual leadership in geriatrics research, encouraging and facilitating multidisciplinary and interdisciplinary collaborations in basic, translational, and clinical research relevant to the health and independence of older persons. In addition, each OAIC includes a Research Career Development Core to provide research training and career development opportunities in geriatrics and related fields.

Description of Disease or Condition

Aging research focuses on a range of conditions, including geriatric syndromes—such as involuntary weight loss, dizziness, and incontinence—and diseases and disorders that are more common among older adults—such as cancer, cardiovascular disorders, stroke, and loss of sensory functions, such as hearing and sight.

By 2030, the number of individuals age 65 or older is likely to double to 70.3 million, and this group will comprise 20 percent of the entire U.S. population, in contrast to 13 percent today.

Burden of Illness

Currently, 35 million Americans are older than 65 years. Of these, more than 4 million are older than 85, and approximately 65,000 have reached their 100th birthday. By 2030, the number of individuals age 65 or older is likely to double to 70.3 million, and this group will comprise 20 percent of the entire U.S. population, in contrast to 13 percent today. The number of the “oldest old”—people age 85 or older—is expected to grow to at least 20.9 million by 2050.⁸

Today, half of all Americans older than age 65 show evidence of osteoarthritis in at least one joint.⁹ More than half of Americans older than age 50 have osteoporosis or low bone mass.¹⁰ Cardiovascular disease, cancer, and diabetes remain common among older Americans.

The ratio of older people to other age groups is important to society because older people, particularly the oldest old, sometimes depend on family members, the government, or both for financial, physical, and emotional support. In addition, a large part of older people’s well-being depends on programs such as Social Security and Medicare, which are financed through the contributions of working-age individuals. When the entire population of baby boomers enters older age, around 2030, the challenge to meet their needs through social, governmental, and other health care services will expand markedly.¹¹

As life expectancy increases, the health care system will need new ways to minimize disease and disability during the additional years of life.

In 2006, U.S. health care expenditures totaled approximately \$2.1 trillion, more than in any other industrialized country.¹² Researchers predict that increased longevity is likely to require more financing from Federal health care systems, including Medicare and Medicaid.¹³ As life expectancy increases, the health care system will need new ways to minimize disease and disability during the additional years of life.

⁸ [Federal Interagency Forum on Aging Related Statistics. Older Americans 2008: Key Indicators of Well-Being. Washington, DC: Federal Interagency on Aging-Related Statistics; 2008.](#)

⁹ For more information, see [MMWR Morb Mortal Wkly Rep 2006;55\(40\):1089-92](#). PMID: 17035926.

¹⁰ For more information, see <http://www.nof.org/advocacy/prevalence/index.htm>.

¹¹ [U.S. Department of Health and Human Services. 65+ in the United States: 2005, Current Population Reports, Special Studies. U.S. Department of Health and Human Services/NIH/NIA and the U.S. Department of Commerce/Economics and Statistics Administration/U.S. Census Bureau: December 2005.](#)

¹² For more information, see <http://www.cdc.gov/nchs/products/pubs/pubd/hsu/healthexpenditures.htm>.

¹³ [Spillman BC, Lubitz J. N Engl J Med 2000;342:1409-15](#), PMID: 10805827; Feder J, et al. *Health Aff* 2000;19:40-56,.PMID: 10812780.

Scope of NIH Activities: Research and Programmatic

OAICs are designed to develop or strengthen each awardee institution’s programs in a key area of aging research, contribute to greater independence for older persons, and offer opportunities for training and career development in aging research for young scientists. The program’s ultimate goal is to enhance translation of basic and developmental research on aging to applications and interventions that increase or maintain independence for older persons.

NIH expects each OAIC, in its selected area of focus, to:

- Provide intellectual leadership and innovation in geriatrics

- Stimulate translation of basic and clinical research in aging
- Facilitate and develop novel multidisciplinary and interdisciplinary research strategies to address current issues in geriatrics care
- Stimulate incorporation of emerging technologies, methods, and scientific advances into research designs
- Serve as a source of advice and collaboration to other institutions regarding technology, methodology, analysis, or other expertise relevant to research in aging
- Provide research training and career development for future leaders in geriatrics research

NIH Funding for FY 2008 and FY 2009

Actual NIH funding for the OAICs was \$14.0 million in FY 2008 and \$14.3 million in FY 2009, including \$0.4 million from ARRA funds.

FY 2008 and FY 2009 Progress Report

Programmatic and Research Activities and Outcome

- The **University of Florida OAIC** focuses its aging research on sarcopenia (age-related muscle loss), including biological mechanisms and contributing factors, as well as the prevention and rehabilitation of disability resulting from sarcopenia. University of Florida researchers examine these issues from interdisciplinary perspectives across the entire spectrum of biomedical investigation, including molecular biology, animal studies, clinical research, behavioral and social sciences, and epidemiology. One ongoing project is evaluating interventions that change fat concentrations in aged rats to assess their effects on physical function, inflammation, damage to cells from free radicals (destructive molecules), cell death, and sarcopenia. This study could lead to testing of other interventions to lower fat concentrations in animals and to study the effect of reduced fat on age-related outcomes. Another project could help in the development of a novel, safe, and practical intervention to reduce muscle loss among older people by improving muscle function without high-intensity exercise.
- The **Boston Medical Center at Boston University** recently received a grant to establish an OAIC in collaboration with Tufts University, the Joslin Clinic, and the New England Research Institute. The central research theme of the new OAIC is to develop therapies that improve muscle function. Currently, few if any drugs or therapies are available to improve muscle strength, mobility, and physical function for frail older people. The OAIC at Boston University will foster collaborations among the university's multidisciplinary team of investigators to improve physical mobility by covering the entire spectrum of drug discovery, from target identification to clinical trials and function-promoting therapies. For example, one project will recruit frail, elderly, vitamin D-deficient women to determine whether vitamin D supplements improve outcomes.
- The **University of Pittsburgh OAIC** provides support and resources for investigators to study balance disorders in the elderly. This OAIC provides an integrated, multidisciplinary approach by pulling resources from five schools at the University of Pittsburgh. The center's long-range goals are to incorporate into clinical care and wellness programs in diverse settings effective interventions to maintain or improve balance and reduce the negative consequences of balance disorders. In addition, the center aims to further define an approach to identify factors that contribute to balance disorders for use in prevention and treatment.

Growing evidence indicates that aging and functional decline might involve changes in the body's

physical and chemical processing of lipids, or fatty substances, but scientists do not yet understand these changes. One current project is enhancing the ability to analyze lipid processing in body fluids and tissue samples from animals and people.

- The theme of the **Duke University OAIC** is to understand and modify different causes of decline in physical functioning. The Duke OAIC develops and evaluates interventions designed to help older Americans prepare for, cope with, and recover from disability arising from late-life disease and aging. Growing evidence indicates that aging and functional decline might involve changes in the body's physical and chemical processing of lipids, or fatty substances, but scientists do not yet understand these changes. One current project is enhancing the ability to analyze lipid processing in body fluids and tissue samples from animals and people.
- The **Johns Hopkins University OAIC** supports research to determine the causes of and potential interventions to reduce frailty in older adults. To support frailty intervention studies, the university created a clinical translation unit and a registry of older adults who might be willing to participate in research. The Johns Hopkins OAIC has established state-of-the-art infrastructure to generate genetic data and analyses related to frailty and has assembled a multidisciplinary team of experienced investigators. The center also has identified new markers of frailty, identified critical biological causes of frailty, and developed a strain of frail mice that investigators can use for research.
- The **University of California, Los Angeles OAIC** supports the development and testing of interventions to prevent disability. The center emphasizes research that builds bridges between basic biomedical science and clinical science. Current projects are addressing the underlying causes of bone loss in osteoporosis and the effects of stroke on nerve-repair genes in the aged brain.
- The **University of Maryland, Baltimore OAIC** is studying rehabilitation approaches involving exercise and motor learning. The goal is to improve the recovery of older adults who have suffered a stroke, hip fracture, or other chronic debilitating disease. The center plans to translate these findings into effective community-based rehabilitation programs. A current study is determining the functional, physiological, and metabolic changes in men and women who fracture a hip.
- The **University of Texas OAIC's** research focuses on age-related sarcopenia, a progressive loss of muscle mass that leads to muscle weakness, limited mobility, and increased susceptibility to injury, and the contribution of sarcopenia to loss of independence in older persons. OAIC researchers have identified protein changes in upper leg muscles associated with hemiparetic stroke (affecting one side of the body). Other studies are assessing the effects of bed rest on muscle function. New technologies under development at the University of Texas OAIC will make it easier to identify damaged proteins in aged tissues, which will help scientists understand the effects of aging on muscle function.
- The **Wake Forest University OAIC's** mission is to assess the risk factors of physical disability in older adults and to develop and test effective prevention therapies. The Cooperative Lifestyle Intervention Program is an 18-month randomized, controlled trial to assess the effectiveness of physical activity, with and without weight loss, in the treatment of mobility disability. The 288 participants are older, overweight, or obese men and women who have cardiovascular disease or metabolic syndrome (a group of medical problems that increase heart disease and diabetes risk).
- The **Yale University Center OAIC's** research theme is the investigation of geriatric health conditions that have several causes. This focus includes single conditions resulting from several contributing factors or affecting several outcomes, and multiple conditions occurring at the same time. One study area is falls among the elderly. The Yale Precipitating Events Project includes monthly assessments of participants' functional status over 10 years. In a landmark clinical trial, investigators from the Yale OAIC demonstrated that functional decline among frail older persons can be prevented through a prehabilitation program targeting underlying impairments in physical capabilities. Future research by this group will develop and test two strategies to restore the ability of older persons living in the community to bathe themselves as well as develop approaches to preventing mobility disability.

In a landmark clinical trial, investigators from the Yale OAIC demonstrated that functional decline among frail older persons can be prevented through a prehabilitation program targeting underlying impairments

in physical capabilities.

- The **University of Michigan Center OAIC**, the first OAIC funded by NIH, advances research on health care problems of older adults. One of the Michigan OAIC's projects is determining whether deficiencies of dopamine (a chemical brain messenger) in older people contribute to gait imbalance and falls. The study investigators hope to demonstrate that L-DOPA, an agent that is converted to dopamine in the brain, could be an effective treatment for older adults who are experiencing problems with walking and falls.

Recommendations for Improving the Effectiveness, Efficiency, and Outcomes of the OAICs

The OAIC Coordinating Center at Wake Forest University facilitates information exchange and research collaborations among OAICs. The Coordinating Center helps develop and implement projects in shared areas of interest. The Coordinating Center's major activities are coordinating and enhancing OAIC training programs and organizing seminars and other activities for trainees at the OAIC Annual Scientific Meeting.

Evaluation Plans

NIH program staff review the progress of each OAIC at the end of each award cycle, typically every 5 years. In addition, a panel of experts external to the OAICs conducts a formal mid-cycle review 2 to 3 years into the funding cycle of each center. This review assesses the OAIC's progress in meeting the goals in its application and identifies areas of concern to address prior to the next competing renewal. NIH staff provides a written summary of the review to each OAIC principal investigator for use in directing the center.

Future Directions

NIH plans to continue to fund new and existing Claude D. Pepper OAICs. Because the number of qualified applicants for OAIC sites continues to grow, a new OAIC site is planned by FY 2010, bringing the total number of OAIC sites to 12.

Table 4-2. Claude D. Pepper Older Americans Independence Centers (OAICs)

Institution and Location	Year Established
Duke University, Durham, NC	1955 ¹⁴

University of Michigan, Ann Arbor, MI	1989
University of California, Los Angeles, CA	1991
Wake Forest University, Winston-Salem, NC	1991 ¹⁵
Yale University, New Haven, CT	1992
University of Maryland, Baltimore, MD	1994
University of Texas Medical Branch, Galveston, TX	1999
Johns Hopkins University, Baltimore, MD	2003
University of Pittsburgh, Pittsburgh, PA	2004
University of Florida, Gainesville, FL	2007
Boston University, Boston, MA	2008

¹⁴ The only remaining Geriatric Research and Training Center.

¹⁵ NIH added a Coordinating Center to the OAIC program in 2005 to promote scientific collaborations among Pepper Center investigators and to facilitate the sharing of unique resources across all sites. The Coordinating Center is currently located at Wake Forest University.