National Institute on Aging (NIA)/National Institutes of Health (NIH): The Dynamics of Health, Aging, and Body Composition

The Health ABC study will identify how increases in body fat and declines in lean mass and bone mineral yield a body susceptible to multiple diseases contributing to disability in old age. 3,075 men and women between the ages of 70 – 79 who are free of disability were selected for this study. Body weight, lean body mass, and body fat are quantified from computed tomography images using software developed by CIT's Biomedical Imaging Research Services Section (BIRSS), Division of Computational Bioscience (DCB).

Lead Agency:

National Institute on Aging (NIA)

National Institutes of Health (NIH)

Agency Mission:

- Support and conduct genetic, biological, clinical, behavioral, social, and economic research related to the aging process, diseases and conditions associated with aging, and other special problems and needs of older Americans.
- Foster the development of research and clinician scientists in aging.
- Communicate information about aging and advances in research on aging to the scientific community, health care providers, and the public.

Principal Investigators:

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Partner Agency:

NIH Center for Information Technology (CIT)
National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK)
National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS)
National Research Council of Italy
American Heart Association
American Diabetes Association
Hologic Inc.

General Description:

The Center for Information Technology is collaborating with the National Institute of Aging to assist in image segmentation and quantification in a clinical research study, the Dynamics of Health, Aging and Body Composition (Health ABC). The Health ABC study will identify how increases in body fat and declines in lean mass and bone mineral yield a body susceptible to multiple diseases contributing to disability in old age. 3,075 men and women between the ages of 70 – 79 who are free of disability were selected for this study. CIT is augmenting the analysis from computerized tomography scans. Lean body mass, and body fat are quantified from computed tomography images using software developed by CIT's Biomedical Imaging Research Services Section (BIRSS), Division of Computational Bioscience (DCB). Manual image segmentation is laborious and subject to inter and intra-observer variability when performing volumetric analysis. An extension of BIRSS' MIPAV software provides researchers with a multistage semi-automatic process for image segmentation, quantification, and visualization.

Excellence: What makes this project exceptional?

The Health ABC study will identify how increases in body fat and declines in lean mass and bone mineral yield a body susceptible to multiple diseases contributing to disability in old age. This should help to address questions of morbidity related to body weight and weight related health conditions in old age.

Significance: How is this research relevant to older persons, populations and/or an aging society?

Older people incur multiple health conditions as they age that affect multiple organ systems. Most studies of aging that had been performed prior to 1998 tended to emphasize the function of one organ system: heart, brain, bone rather than a comprehensive assessment. Health ABC used the principle of weight-related health conditions to organize a multi-dimensional study.

Effectiveness: What is the impact and/or application of this research to older persons?

This research has shown that the same risk factors that cause early declines in function contribute to later, major losses in function and the onset of frailty. This is a powerful prevention message for aging.

Innovativeness: Why is this exciting or newsworthy?

Early interventions on weight, heart disease, diabetes, inflammation, and depression may prevent later declines to frailty in old age.