

JEAN MAYER
USDA
HUMAN
NUTRITION
RESEARCH
CENTER ON
AGING



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Associate Director and Senior Scientist

About the HNRCA

30 years ago, the HNRCA came into existence because the US Congress found that...

“...there is evidence of a relationship between nutrition and many of the leading causes of death in the U.S.; that improved nutrition is an integral component of preventive health care; that there is a serious need for research on the effects of diet and degenerative diseases and related disorders.”

The HNRCA's mission is to find ways that nutrition promotes healthy aging and prevents chronic diseases.

About the HNRC

Largest research center in the world
studying nutrition and healthy & active
aging

270 scientists, trainees and staff

17 research labs covering a wide range
of nutrition and age-related topics

Collaboration between USDA and Tufts
University

Our research impacts nutritional
recommendations and requirements,
public policy, and clinical healthcare

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graph LR; A[Basic Science/Animal Studies] --> B[Epidemiological Research]; B --> C[Clinical Investigation]; C --> D[Health Policy Recommendations]; D --> E[Public Knowledge]
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**Basic Science/
Animal Studies**

**Epidemiological
Research**

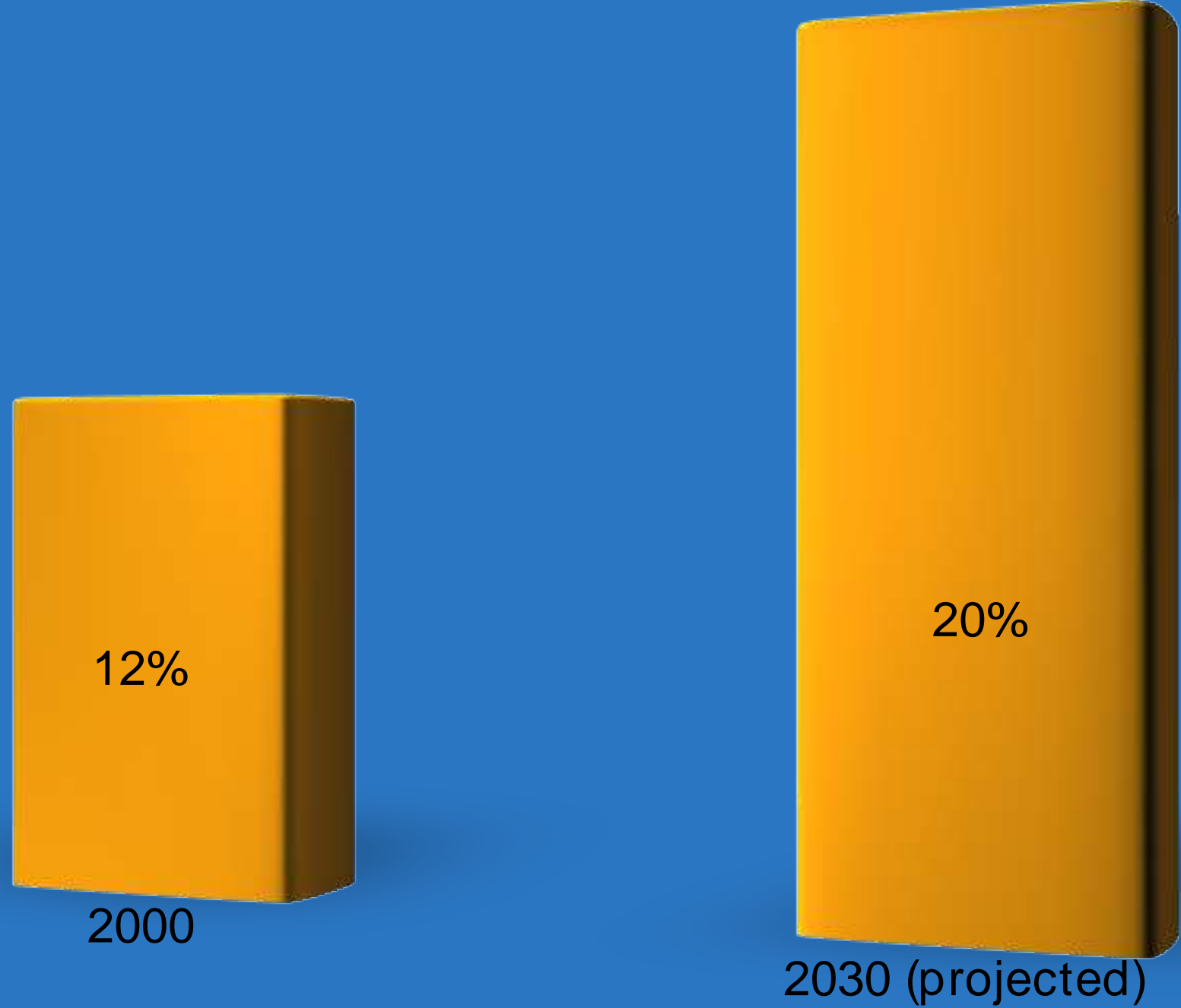
**Clinical
Investigation**

**Health Policy
Recommendations**

**Public
Knowledge**

It is estimated that by 2050, there will be 395 million people living to be 80 years old.

The increase in the number of Americans over the age of 65



What we do



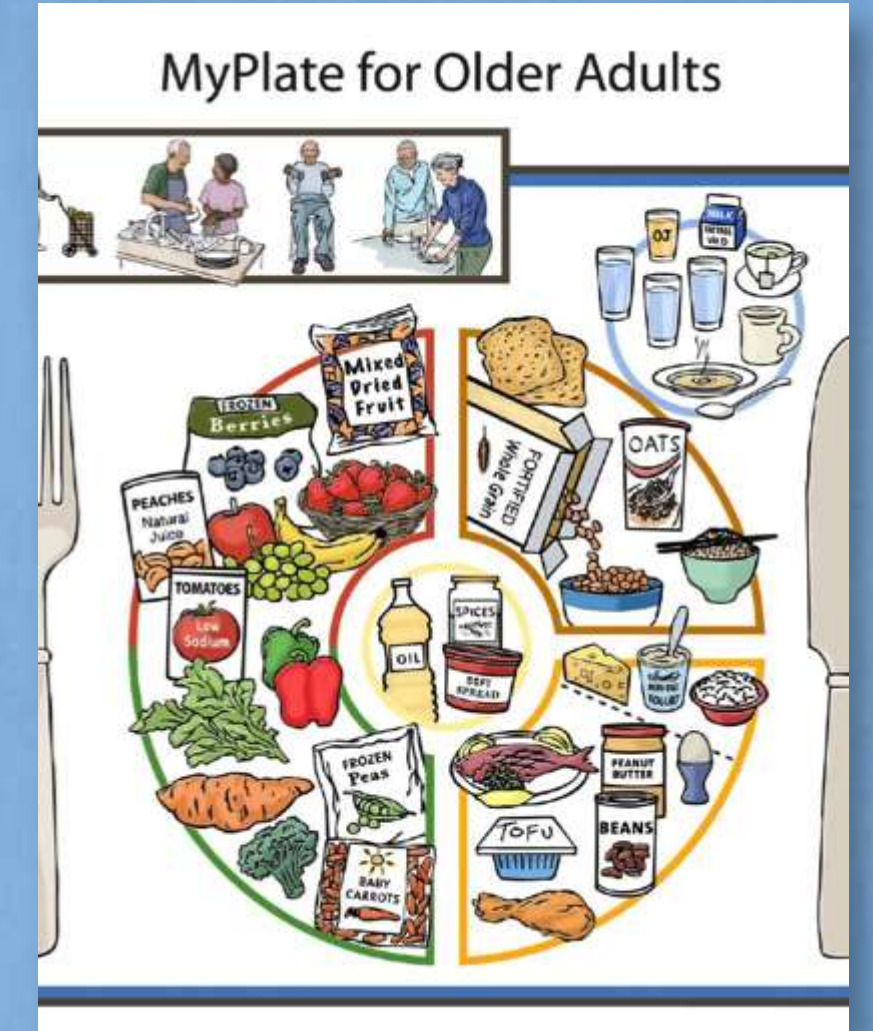
14-story research facility in downtown Boston



Lab science

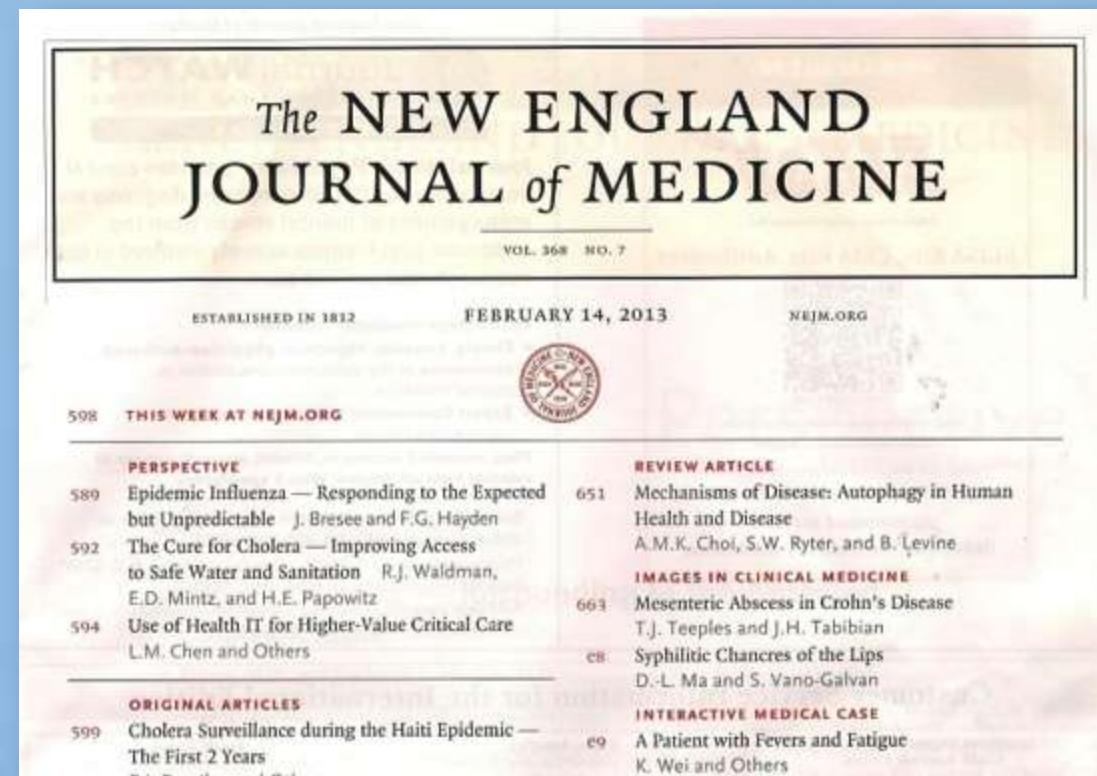


Volunteer studies



Outreach of research

Our Impact



At least 170 scientific publications yearly



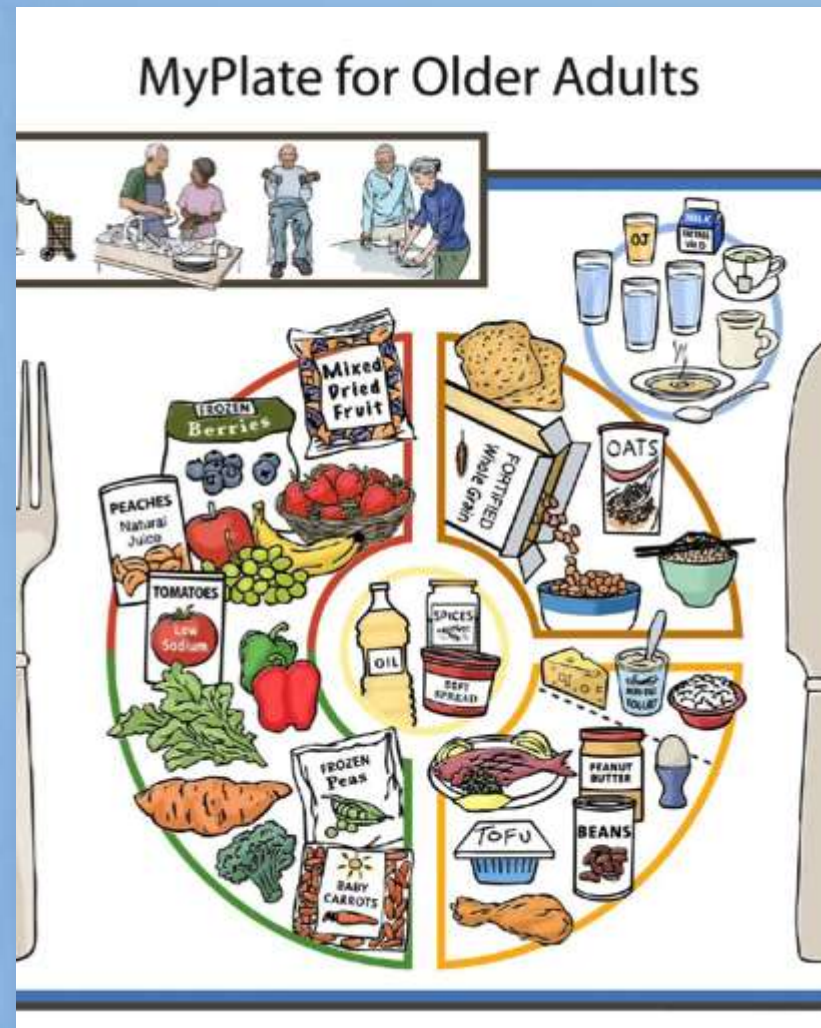
730 media mentions in 2013



Community engagement

Translating our research to the public...

Community Outreach



My Plate



Lobby Garden



Talk and Taste



Fit-4-Life

Issues impacting quality of life in older adults



genetics



lifestyle



environment



rate of aging



disease



Longevity
(healthspan)

Annual health care spending



Proper nutrition contributes to deterring these conditions.

A significant portion of older population in USA have nutritional problems exhibited as both under-nutrition (micronutrient deficiencies) and over-nutrition (obesity).

Compromised micronutrient status/intake observed in older adults in the USA

Vitamin D → bone and muscle strength, etc.

Calcium → bone and muscle strength

Vitamin E → protects cells from free radical damage

B12 → nerve and blood health

B6 → metabolism

Folate → cell division

Zinc → immune system

Selenium → fights infection

Iron → oxygen transport

Modification of extrinsic factors



nutrition



lifestyle



exercise

combined with



psychosocial

create

Healthy aging

improved functionality
improved quality of life

WEIGHT

More than one-third of U.S. adults (35.7%) are obese.

Obesity-related conditions include heart disease, stroke, type 2 diabetes, certain types of cancer, and contribute to nutrient deficiencies in older adults.

WEIGHT

Restaurant calorie counts are inaccurate

When you eat may be as important as what you eat.

Mediterranean diet

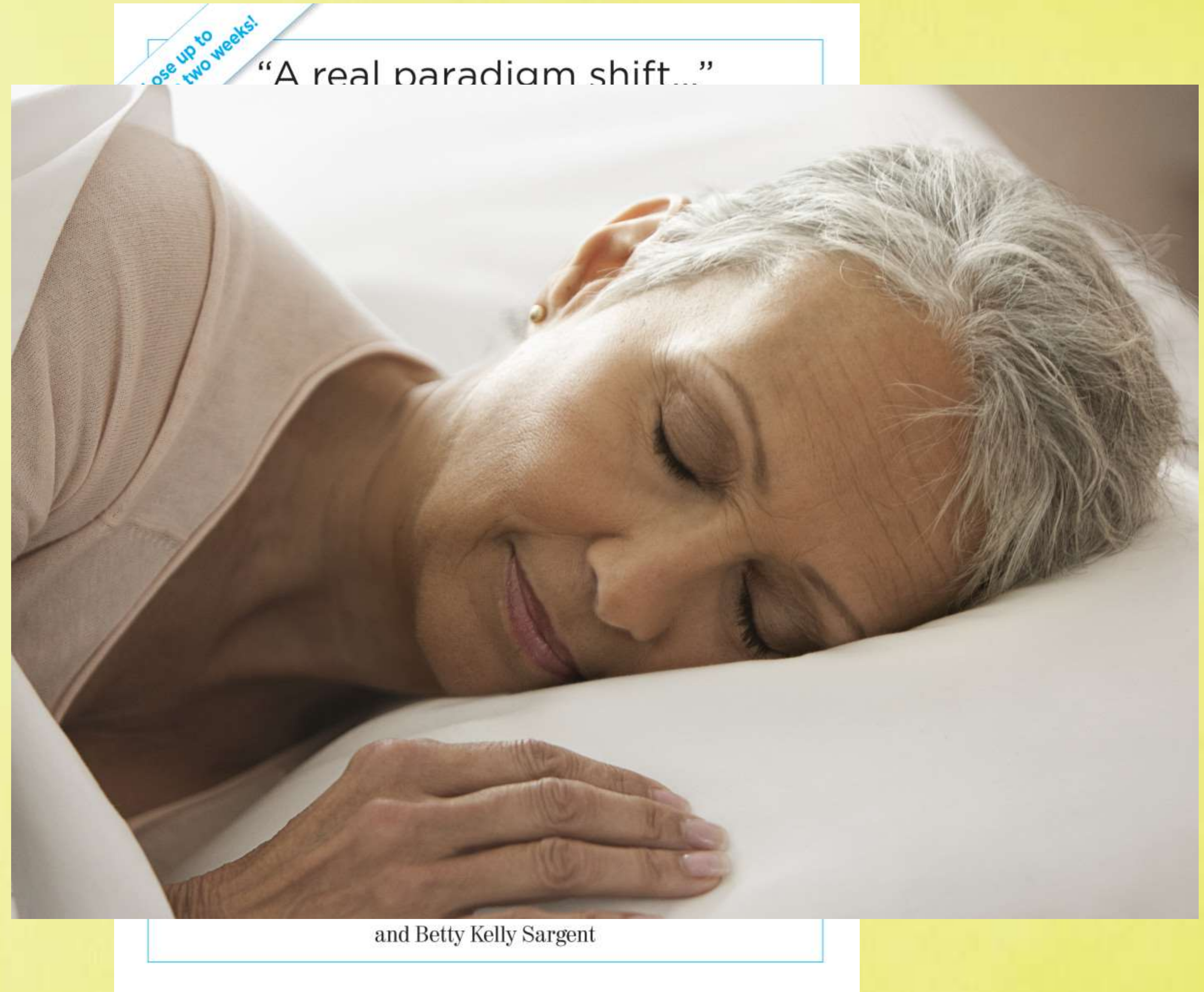


WEIGHT

Increased fiber intake can decrease appetite (*The iDiet*)

Consuming yogurt can reduce weight gain over time.

Effects of sleep on weight loss



MUSCLE AND BONE FUNCTION

Falls are the leading cause of fatal injury among older adults.

Falling is not an inevitable result of aging.

MUSCLE & BONE FUNCTION

Importance of vitamin
D/calcium in falls and
osteoporosis

Consume neutral or alkaline
food for better bone density.

Eat vitamin K.



Physical Activity Guidelines Advisory Committee Report, 2008

“Strong consistent *observational* evidence indicates that mid-life and older adults who participate in regular physical activity have reduced risk of moderate or severe functional limitations and role limitations (disability).”

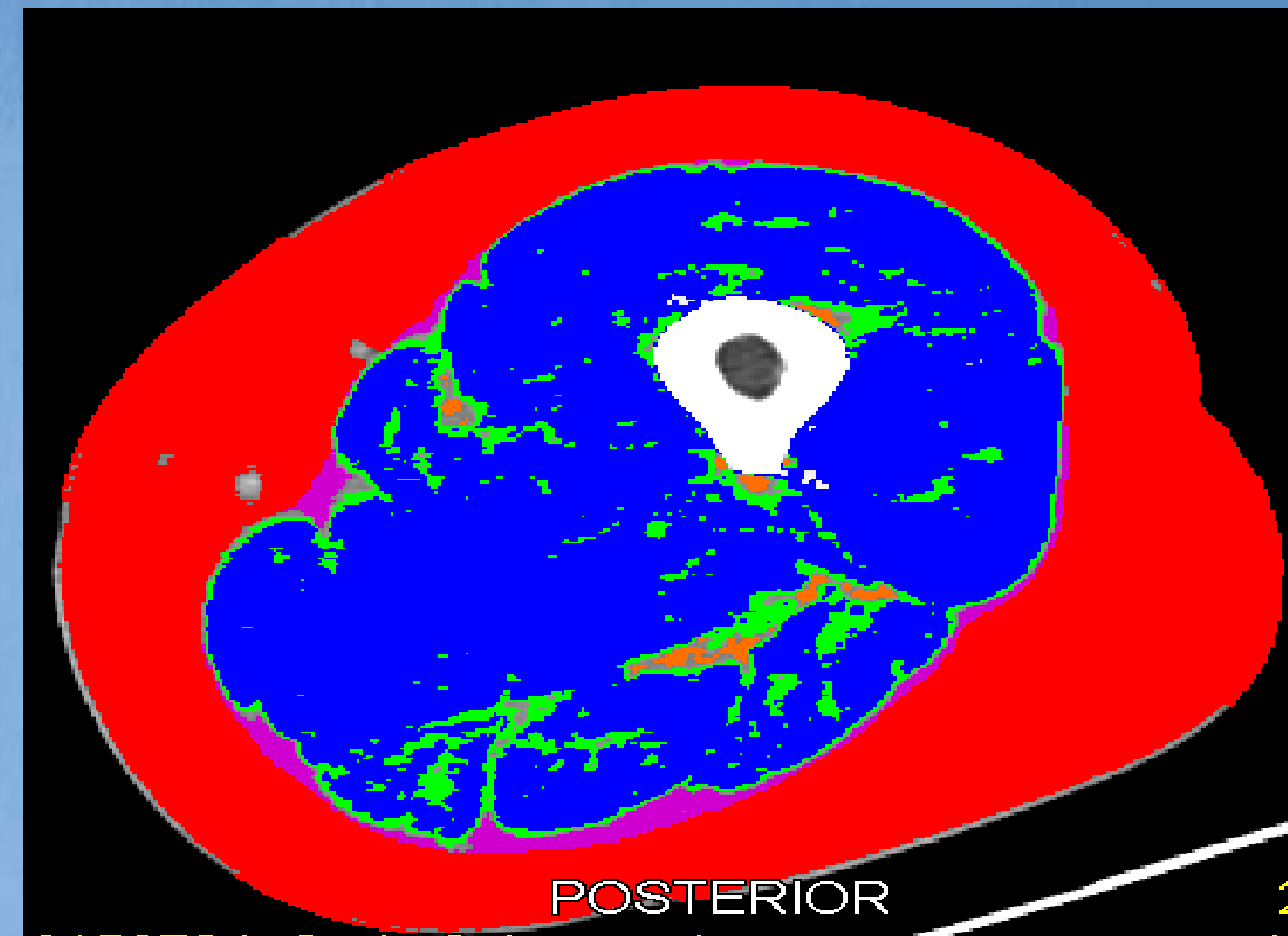
- “Future research needs to focus on large-scale well-designed trials to ascertain whether physical activity programs can prevent disability and role limitations as people advance into old age.”

2008 US Dept. of Health and Human Services

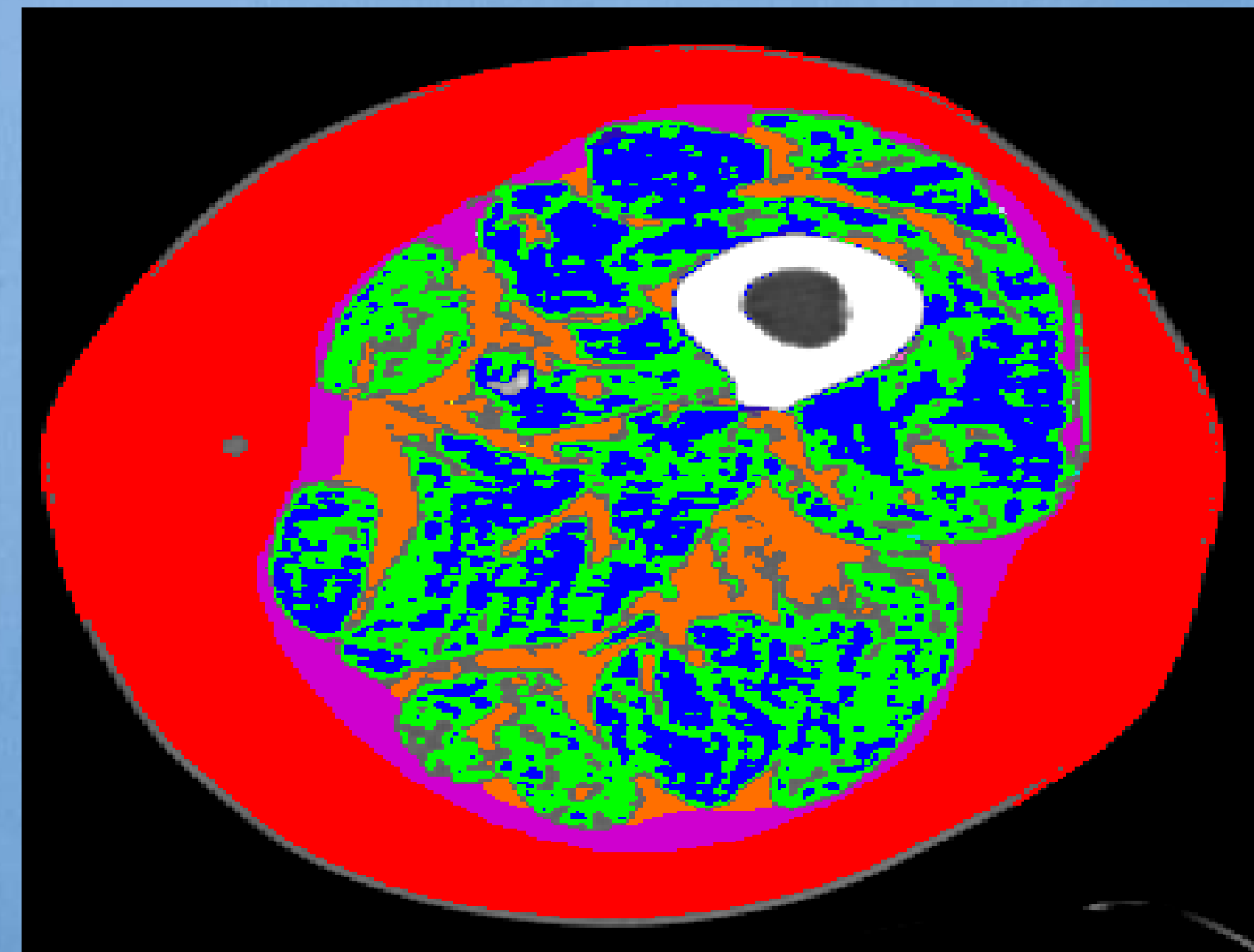
MUSCLE & BONE FUNCTION

Sarcopenia:
Age-associated loss in
muscle mass and
function

Female 70 yrs.
BMI = 23.3



Female 85 yrs.
BMI = 24.6



MUSCLE & BONE FUNCTION

a total of 1,635 recruits included in final study

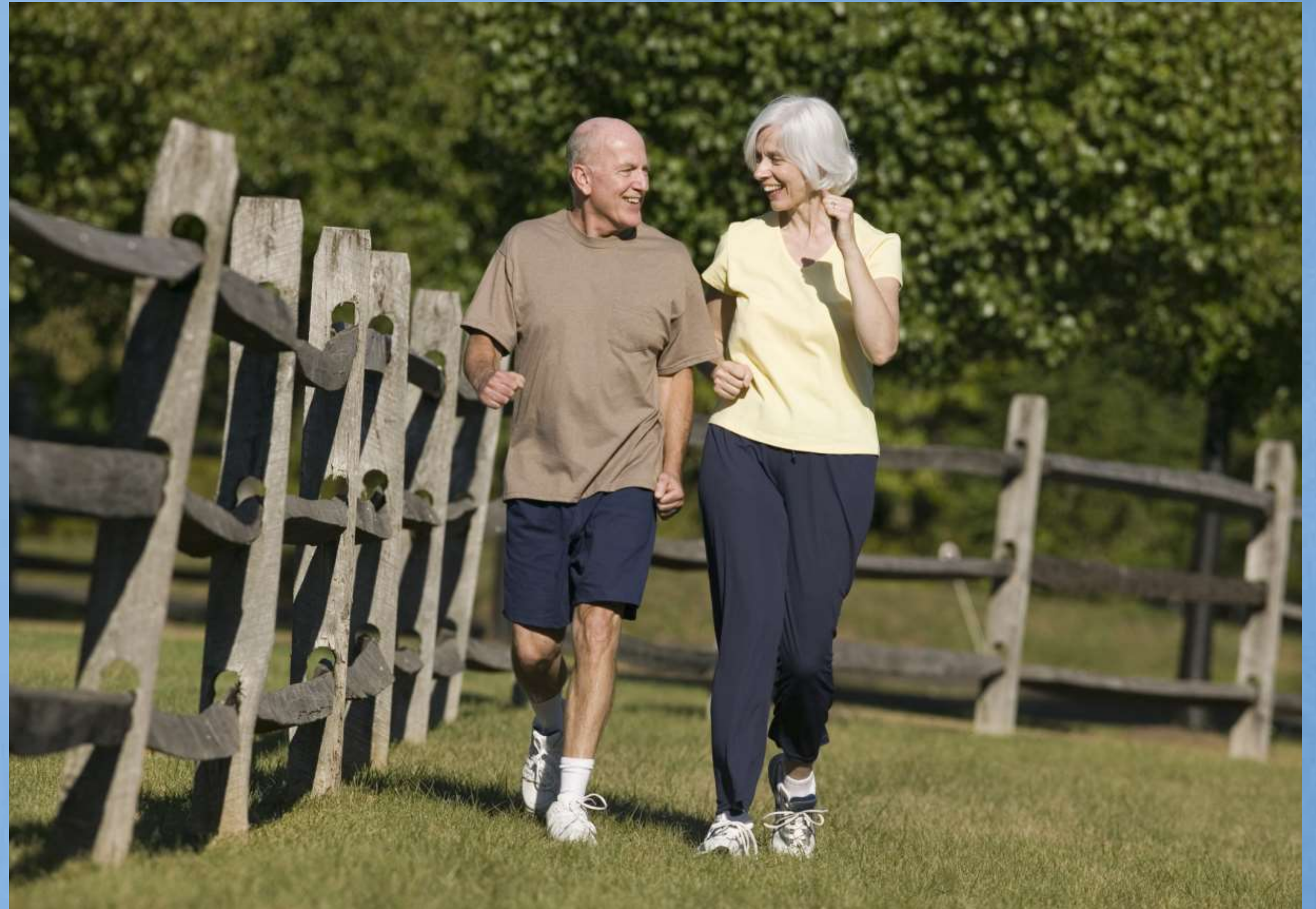
The LIFE STUDY

A structured moderate intensity physical activity program, compared with a health education program, reduced major mobility disability over 2.6 years among older adults at risk of disability

MUSCLE & BONE FUNCTION

Lift weights (all major muscle groups) at least 2 times a week to retain muscle.

Weekly: Do 150 min. of moderate intensity aerobic physical activity or 75 min of vigorous intensity aerobic activity.



HEART HEALTH

A common problem related to aging is “hardening of the arteries,” called arteriosclerosis.

HEART HEALTH

Have plenty of fiber.

Try eating an oily fish twice a week instead of fish oil pills.



COGNITION

All aging humans will develop some degree of decline in cognitive capacity as time progresses.

COGNITION

The effects of blueberries and strawberries on neurocognition

Increase folate, B6 and B12 consumption to deter dementia.

Concord grape juice may enhance cognitive function.



VISION

Most of the aged will confront age related vision problems with compromises to quality of life.

VISION

Lower your glycemic index.

Lutein-rich foods can decrease risk of AMD and cataracts.



INFECTION & IMMUNE-RELATED DISEASES

The immune system is one function of the body profoundly affected by aging.

INFECTION & IMMUNE-RELATED DISEASES

Wolfberry or goji berry and
possible flu protection

White mushrooms and food-
born pathogens

Cranberries prevent UTIs



Things to look for in the future in nutrition and aging...

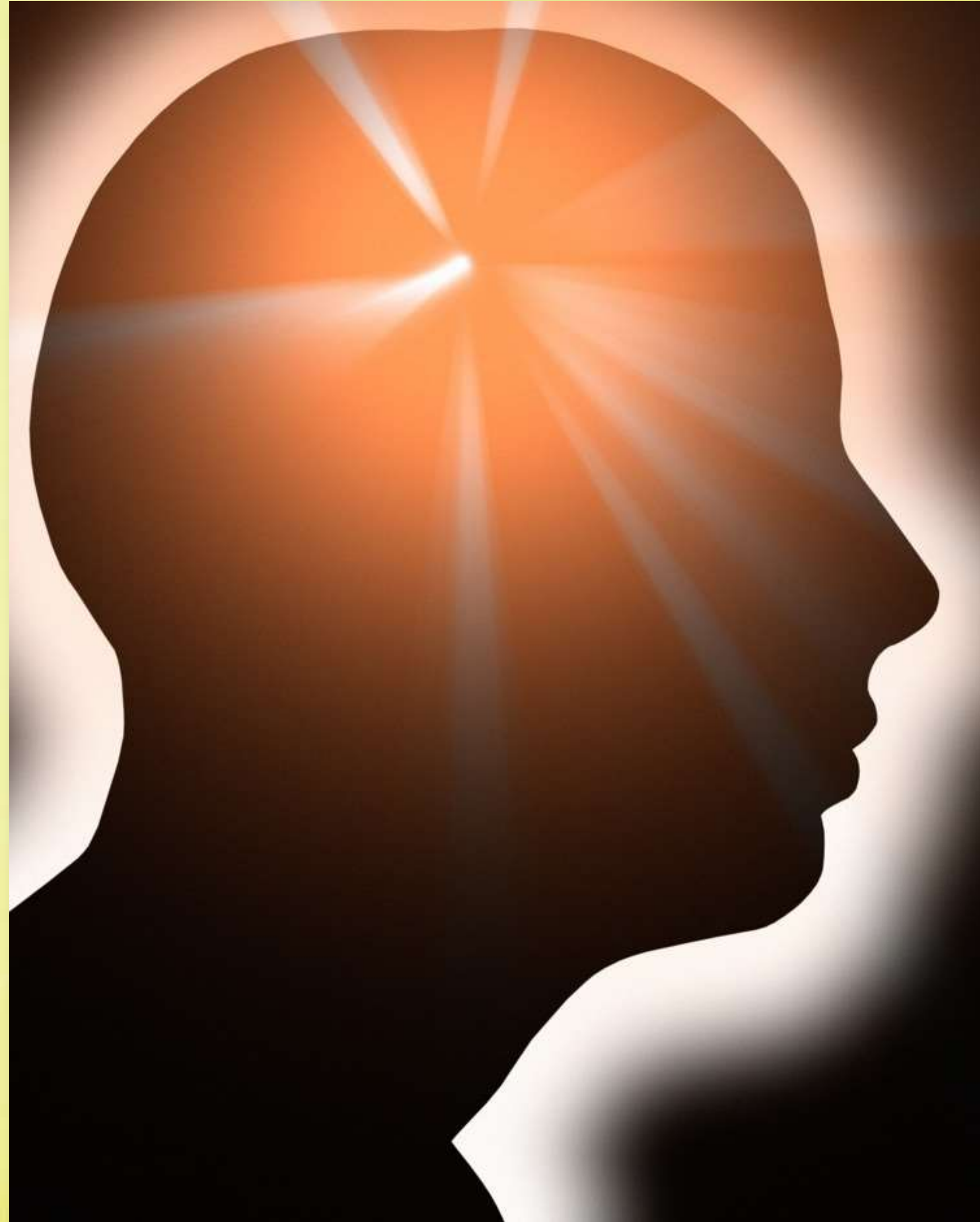
developing
diets that
complement
genetic
makeup



Neurobiology of aging

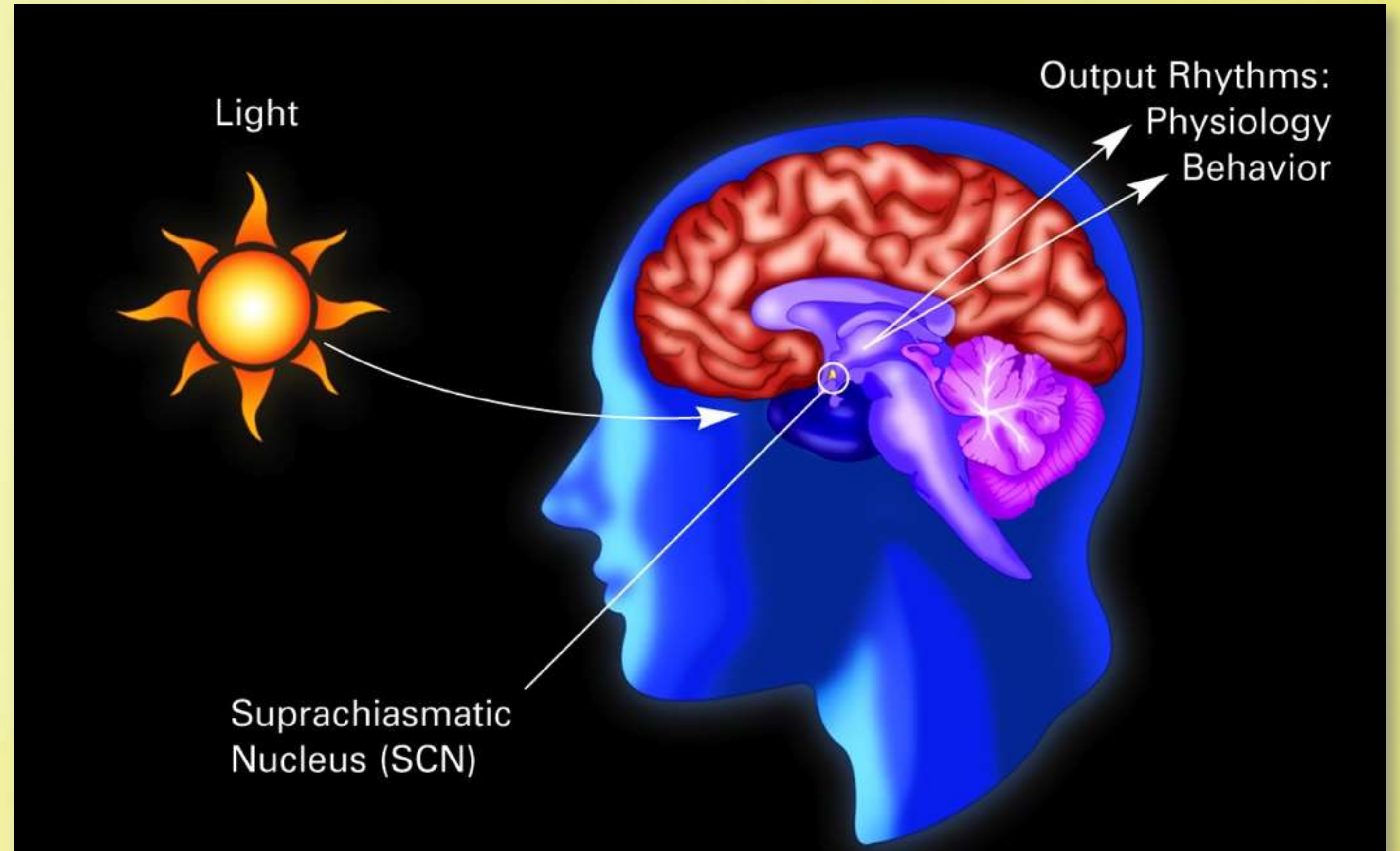
nutritional modification of
stem cells to repair the aged
brain

leading to possible
Alzheimer's cures



Circadian rhythm of clock genes

basing food intake on a personalized clock to deter obesity and chronic diseases



Gut microbiome

How diets impact gut microbiota:

impacts on cancer, infection,

inflammation, weight control



D2d trial

Does vitamin D supplementation help prevent or delay type 2 diabetes?



“Eat and sleep and you will live a long time... You have to learn to relax.”

- Misao Okawa, turned 116 in 2014



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Thank you
Questions?

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