

HEALTHY AGING

Lessons from the
Baltimore Longitudinal Study of Aging



NATIONAL INSTITUTE ON AGING

NATIONAL INSTITUTES OF HEALTH

U.S. DEPARTMENT OF HEALTH & HUMAN SERVICES



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FOREWORD

Just like millions of Americans, the National Institute on Aging's (NIA) Baltimore Longitudinal Study of Aging (BLSA) celebrates its 50th birthday in 2008. The study was the first to ask a most basic question: What is normal aging?

There is still much to learn, but so far two major conclusions can be drawn from BLSA data. First, "normal" aging can be distinguished from disease. Although people's bodies change and can in some ways decline over time, these changes do not inevitably lead to diseases such as diabetes, hypertension, or dementia. A number of disorders that typically occur in old age are a result of disease processes, not normal aging.

Second, no single, chronological timetable of human aging exists. We all age differently. In fact, in terms of change and development, there are more differences among older people than among younger people. Genetics, lifestyle, and disease processes affect the rate of aging between and within all individuals.

These fundamental changes in our thinking about age and disease have led the BLSA and the field of aging research in important new directions. As we further pinpoint the influences on how we age, we can also think about new and more effective interventions that may prevent disease and promote healthy aging.

This booklet was developed to celebrate the 50th anniversary of the BLSA and the wealth of data and insights it has given us. It also provides an occasion to share some of what we know about aging and aging well from a large body of research, including the BLSA. As you read through this booklet, we hope you will find it useful in thinking about your own aging and steps you can take that might make a difference for maintaining your health.

We dedicate this booklet to the thousands of BLSA volunteer study participants, scientists, and support staff who have joined in a unique and sustained research enterprise over five decades. Their partnership has been a gift that benefits us all.



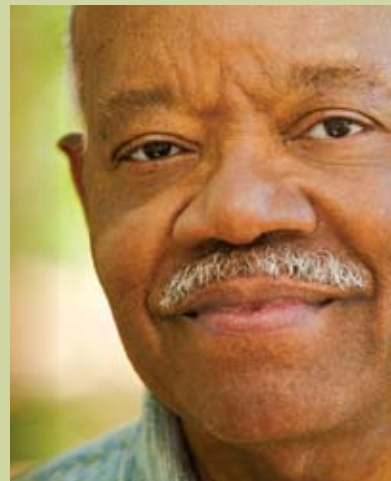
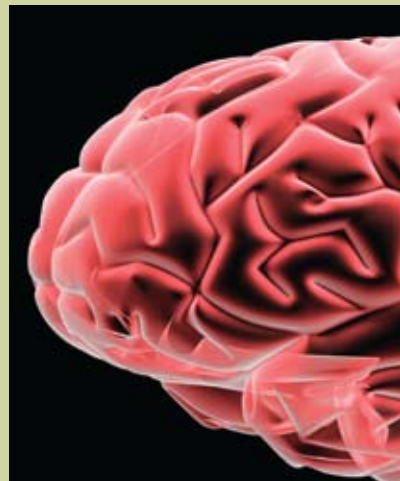
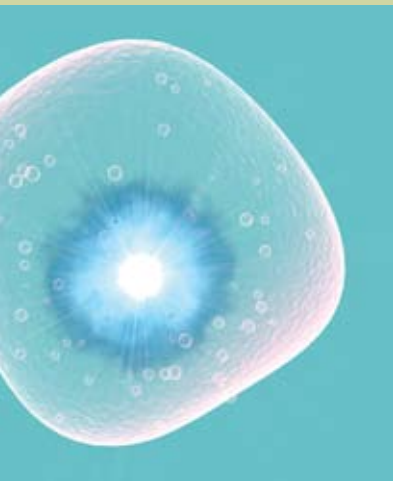
Richard J. Hodes, M.D.
Director
National Institute on Aging
National Institutes of Health

Dan L. Longo, M.D.
Scientific Director
National Institute on Aging
National Institutes of Health

Luigi Ferrucci, M.D., Ph.D.
Director, Baltimore Longitudinal
Study of Aging
National Institute on Aging
National Institutes of Health



ABOUT THE NATIONAL INSTITUTE ON AGING



The National Institute on Aging (NIA), part of the National Institutes of Health, was established to improve the health and well-being of older people through research. As part of its mission, the NIA investigates ways to support healthy aging and prevent or delay the onset of diseases disproportionately affecting older adults. NIA’s research program covers a broad range of areas, from the study of basic cellular changes with age to the examination of the biomedical, social, and behavioral aspects of age-related conditions. Although the main purpose of this research is to increase “active life expectancy” — the number of years free of disability — it may also promote longevity.

DR. LUIGI FERRUCCI

Studying aging processes and discovering solutions that can reduce the burden of

disease and disability on older people has been the dream of my life. I started to pursue a career as a geriatrician and a gerontologist in Florence, Italy, in my early twenties when almost every exciting discovery about aging began at the BLSA. At that time, I confess that while my friends were idealizing rock stars and soccer players, Nathan Shock was my hero.

So, you can imagine that when I moved to the U.S. in 2002 to become the new director of

the Baltimore Longitudinal Study of Aging, I was proud, enthusiastic, and extremely frightened. Since then, my dedication and attachment to the BLSA has grown steadily and my fear has faded. I work with a team of committed, bright, creative, and hard-working scientists, nurses, health workers, and administrators. Of special joy are the connections I've made with the BLSA participants who are the true soul of the study. Listening to their stories, capturing the multi-faceted aspects of their lives, and understanding their prob-

lems has taught me more about aging than reading any number of books or articles. I could never find words beautiful enough to thank each participant properly. I will not even try.

However, I promise that their effort and their generosity will be fruitful, that everyone

associated with the BLSA will work to produce the best possible science,

and that we all are committed to translating these findings into

actions to improve the quality of life for older people.

Of special joy are the connections I've made with the BLSA participants who are the true soul of the study.



Dorothy broke open her fortune cookie and read its contents: **“May you live a long, healthy life.”** Who doesn’t hope for longevity combined with good health in later years?



WHY STUDY AGING?

The Beginning of Something New— The Baltimore Longitudinal Study of Aging

For the most comprehensive and longest running longitudinal examination of human aging in the world, NIA’s Baltimore Longitudinal Study of Aging (BLSA) had a simple beginning. It started with a conversation in 1958 between Nathan Shock, Ph.D., Chief of the Gerontology Branch at the National Institutes of Health (NIH), and William W. Peter, M.D., a retired U.S. Public Health Service officer and missionary doctor. Peter had a long-established reputation for his dedication to medicine and wanted to know how he could make a final contribution — donating his body to science. But Shock had something else in mind. He wanted to discuss the direction he believed aging research should take. Breaking with scientific convention, Shock wanted to study normal aging, and he wanted to do it by repeatedly evaluating the

same people over time. He hypothesized that important concepts pertinent to aging could only be understood by looking at healthy, independently living people at regular intervals over a number of years. Shock didn’t just want bodies donated to study aging after death; he wanted living people participating in scientific studies. This was a radical concept that intrigued Peter. He volunteered to be the first participant. Soon, Shock and Peter were joined by study coordinator Arthur Norris, described by Shock as his “steady right hand.” The three men outlined the new study’s parameters. The BLSA would “observe and document the physical, mental, and emotional effects of the aging process in healthy, active people.” Women were not originally part of the study design, but joined the BLSA in 1978, offering scientists

the opportunity to better understand the influence of sex on aging, especially important because at the time women lived 8 to 9 years longer than men. Many of the original female participants were wives or widows of male volunteers.

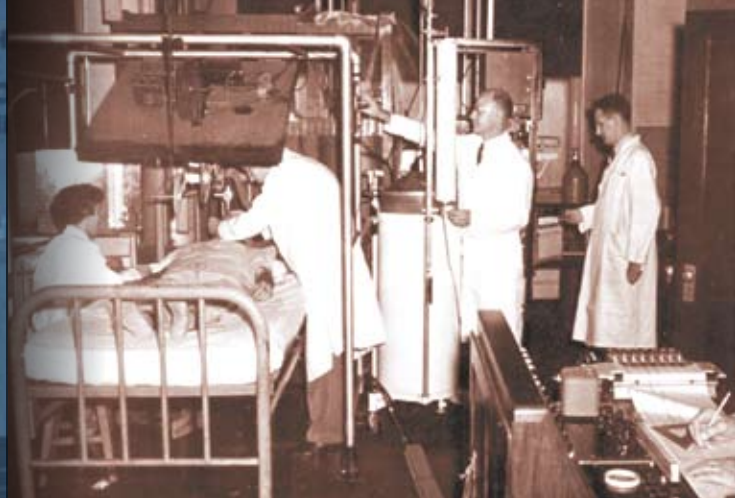
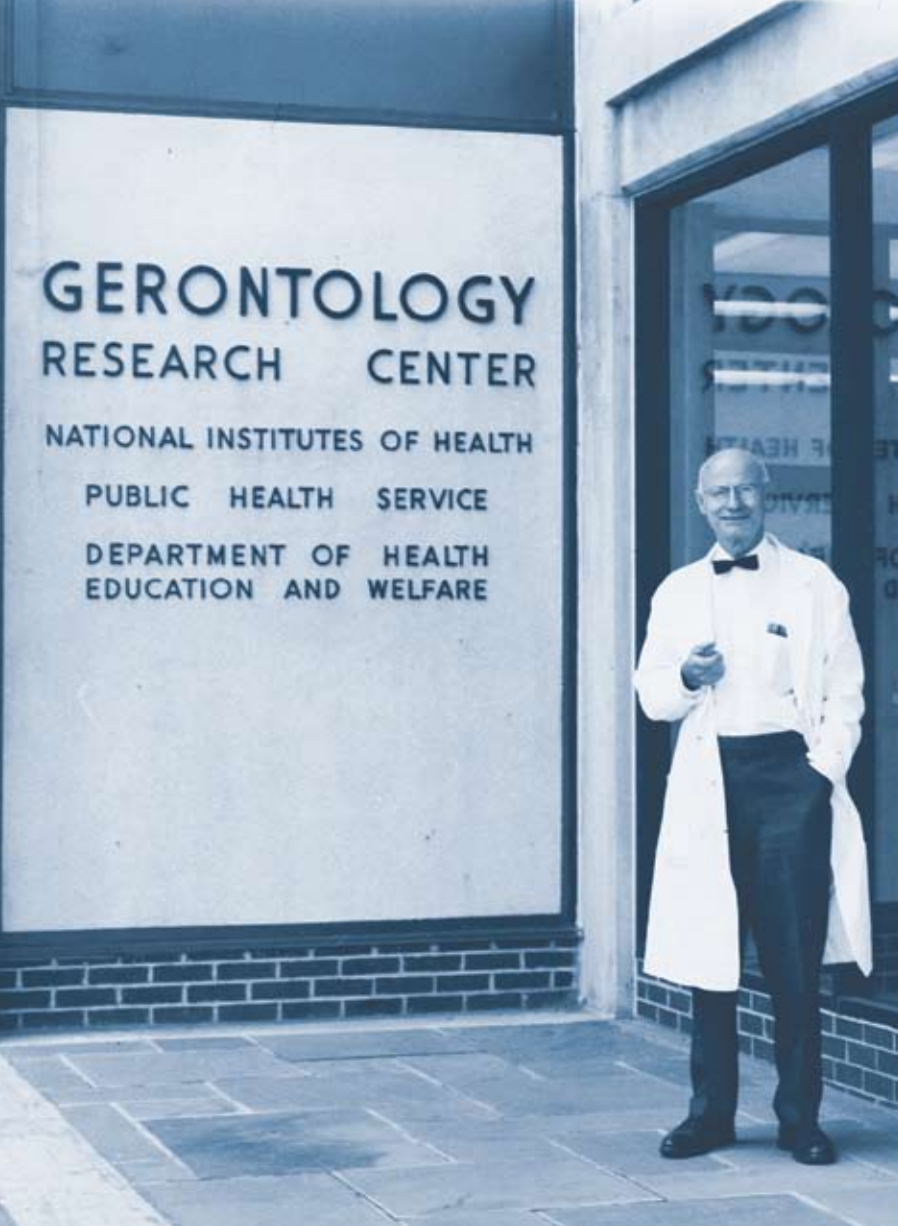
Currently, NIA's Intramural Research Program in Baltimore welcomes more than a thousand male and female BLSA participants ranging in age from their twenties to nineties, who come every 2 years for a variety of tests to help scientists observe changes over years of life. Participants receive a complete physical exam and tests of mobility, body composition, muscle strength, bone density and geometry, cardio-respiratory function, nervous system anatomy and function, glucose metabolism, inflammation, hormones, and more. Like pioneer participant Peter, volunteers often say they are proud of their contribution to science. Along with personal gratification, another benefit to BLSA participants is learning about their health. For

instance, as scientists investigate bone density changes over time, participants learn how their individual risk for fractures from these changes may fluctuate with age.

As the BLSA answers many of its original questions about aging, scientists are formulating new ones. Keeping in step with emerging research interests, the study has turned its attention to increasingly prevalent health issues such as obesity, loss of muscle mass and strength (sarcopenia), disability, and cognitive disorders. For example, in 1993, BLSA investigators began a 9-year study using brain scans to learn if cognitive changes, like visual memory and mental skills, can be related to structural changes in the brain. They discovered that, over time, even very healthy older adults lose a significant amount of brain volume as part of normal aging. By introducing new areas of study and continually evolving, the BLSA maintains a steadfast influence on health research.

Below: **Gerontology Research Center dedication in 1968**





Left: **Nathan Shock, Ph.D.**
Above (top left): **William W. Peter, M.D.**
Above (top right): **Arthur Norris**
Above: **Nathan Shock, Ph.D., in clinical setting, 1953**





Designing a Different Look at Aging and Time

The BLSA's longitudinal design helps investigators piece together a more accurate picture of normal aging. Before the BLSA, scientists generally conducted cross-sectional studies, comparing participants in one age group to a different set of people in another age group. Most of the differences between these groups may not have been attributed to age but the result of life experiences, genetics, or environmental factors. Imagine comparing two people, one who has lived through two wars and the other who was raised in a peaceful and prosperous society. How each aged might be different but the effect of age alone would be difficult to sort out. By looking at the same individuals over time, external influences are reduced. Longitudinal research allows scientists to gather thousands of case studies of human aging.

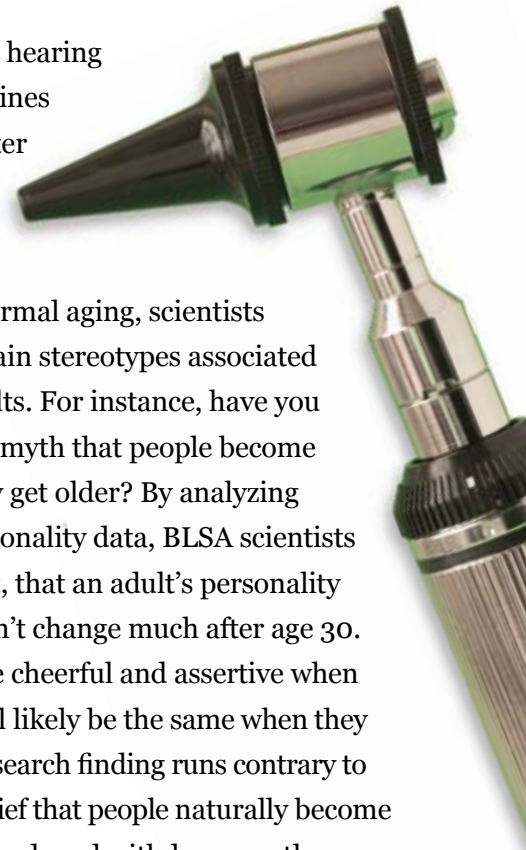
What Is Normal Aging?

True to Shock's vision, the BLSA still looks for answers to the question, "What is *normal* aging?" This may seem like a simple question, but for scientists, it gets to the heart of something quite complex: how to identify the true effects of aging and how to separate factors such as disease, socioeconomic disadvantage, or lack of educational opportunity from the underlying biological or other mechanisms common to human aging.

The study of normal aging has helped change our understanding of what it means to grow older. Although, for the most part, people age differently, scientists have identified certain common changes experienced by nearly everyone. For example, BLSA scientists observed that people who have no evidence of hearing disorders or noise-induced hearing loss still lose some of their hearing with age — that's normal — but the pattern of this loss varies from person to person. The scientists

also noted that hearing sensitivity declines earlier and faster in men than in women.

By studying normal aging, scientists disproved certain stereotypes associated with older adults. For instance, have you ever heard the myth that people become meaner as they get older? By analyzing long-term personality data, BLSA scientists learned, in fact, that an adult's personality generally doesn't change much after age 30. People who are cheerful and assertive when they are 30 will likely be the same when they are 80. This research finding runs contrary to the popular belief that people naturally become cranky, depressed, and withdrawn as they age. The finding suggests that marked changes in personality are not due to normal aging, but instead may be related to disease or dementia.



What Are the Links Between Aging and Disease?

To study normal aging, BLSA scientists originally attempted to cut out all diseases from their research. They found, as predicted, that “normal” aging is not synonymous with disease. But they also found that the two were probably not independent either. Because research is an iterative, cascading process, the answers to “What is normal aging?” led scientists to the question, “What is the relationship between aging and disease?” It is well established that the risk of developing many diseases increases with age. One of the BLSA’s biggest contributions to biomedical science is its ability to investigate this relationship.

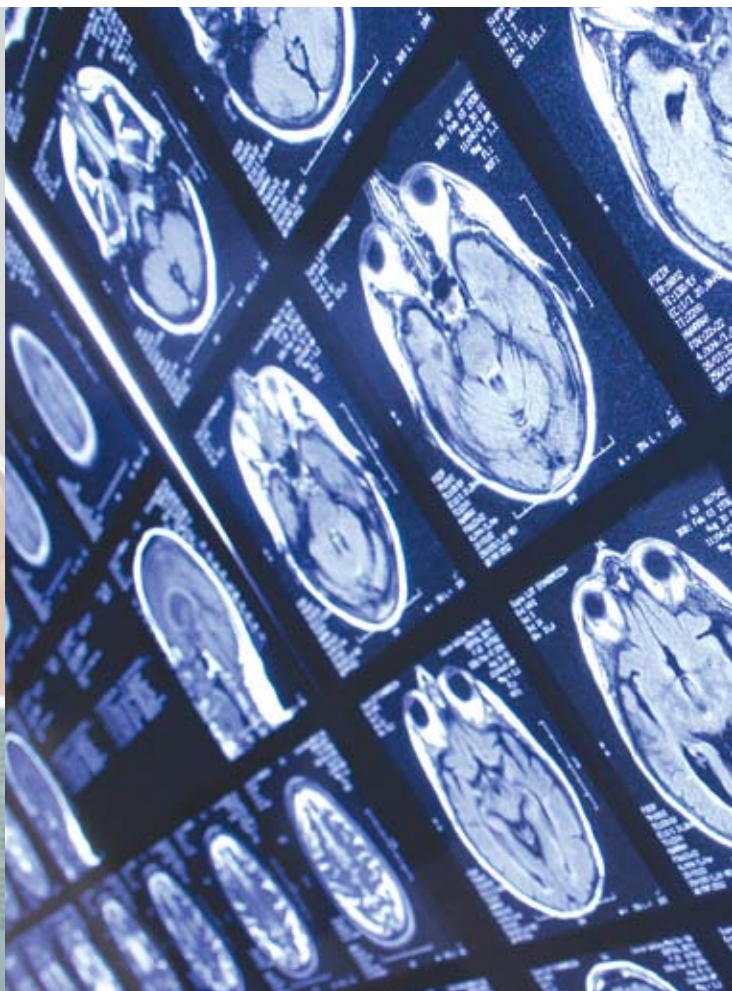
In this vein, the BLSA is changing our understanding of cardiovascular disease. Scientists looking at the aging heart found that age-related changes in the arteries, like arterial stiffening, do increase the risk for cardiovascular diseases. They also found that cardiovascular diseases,

in turn, accelerate arterial aging. Given this correlation, scientists realized that they could not study the normal aging heart without considering heart disease. And, by studying the two together, they would be better equipped to identify strategies to prevent or slow arterial aging before cardiovascular disease occurred.

BLSA’s longitudinal design supports the pursuit of links between aging and disease. Scientists can look back at information collected from participants over time, including data from years before a diagnosis, and attempt to identify the changes that precede and perhaps predict clinical symptoms, the so-called precursors of disease. They can determine what distinguishes two seemingly healthy people: one who will go on to develop a certain health problem, the other who will not.

The discovery of the relationship between prostate-specific antigen levels, or PSA levels, and prostate cancer illustrates the value of this “retrospective.” While the medical community knew that the PSA enzyme tended to be elevated among men with prostate cancer, definitive information about the rate of this change in precancerous men was unknown. In 1991, BLSA researchers analyzed blood samples collected over a period of years from 54 men in the study (18 already diagnosed with prostate cancer), to see how the PSA levels changed over time. This small early study revealed there was a rapid rise in PSA levels about 5 years before the prostate cancer was diagnosed. The men without cancer, including those with benign prostate growth or hyperplasia, did not have this rapid rise in PSA levels. BLSA researchers also observed that the rate of PSA change is a more sensitive method of detecting prostate cancer than using





a fixed cutoff value. Furthermore, scientists determined that examining the ratio of free PSA (not attached to a protein) to total PSA helps reduce incorrect diagnosis; moreover, the percentage of free PSA in the blood can predict the aggressiveness of prostate cancer a decade before diagnosis.

The unique opportunity to look back at the participant's clinical history also benefitted research on dementia. BLSA measurements of cognition — the ability to think, learn, and remember — began in 1960. Scientists were then looking for natural changes with age. In 1985, the focus shifted to distinguishing normal cognitive decline from decline associated with dementias like Alzheimer's disease (AD). BLSA's longitudinal data was

used by scientists to create a history map for the time preceding a participant's diagnosis of AD. These maps showed when participants experienced an accelerated decline in memory, verbal intelligence, and executive function (the ability to use past experiences to carry out cognitive actions like correctly categorizing animals, fruits, and vegetables or identifying and recalling important details). In 2008, BLSA scientists reported that almost everyone experienced a steady rate of natural decline in their cognitive abilities. However, the rate of decline among people who went on to develop AD varied over time. Memory decline, for example, increased (compared to normal) approximately 7 years before the AD diagnosis and then accelerated a second time 2 to 3 years before diagnosis.

KATY SWANSON

I have been with the BLSA since May 2001 as a Geriatric Nurse Practitioner. I'm responsible

for overall clinical assessment and evaluation, which means that I collect history information and obtain consent from BLSA participants, do their physical exams, and explain BLSA test results. By being part of the BLSA team, I have grown in my clinical expertise and learned so much about the research process. I feel the atmosphere at the BLSA is invigorating and

stimulates me to continue in this professional role. Each of us working on this study is made to feel we are an integral part and so important in achieving the goals of the BLSA.

When I was first hired to work with the BLSA, I planned on a 2-year commitment and then I thought I'd return to oncology nursing. Yet, I am still here. The participants are one of the primary reasons I stay with the study. Their continued dedication and commitment are so impressive. Many of them have more than 20 visits (that's over 40 years), all on a voluntary basis. I have had the opportunity to

develop friendships with many participants. They set the standard for my motivation to stay healthy. Without the participants, there would be no study. There is no way that we can adequately thank them for their continued contribution.

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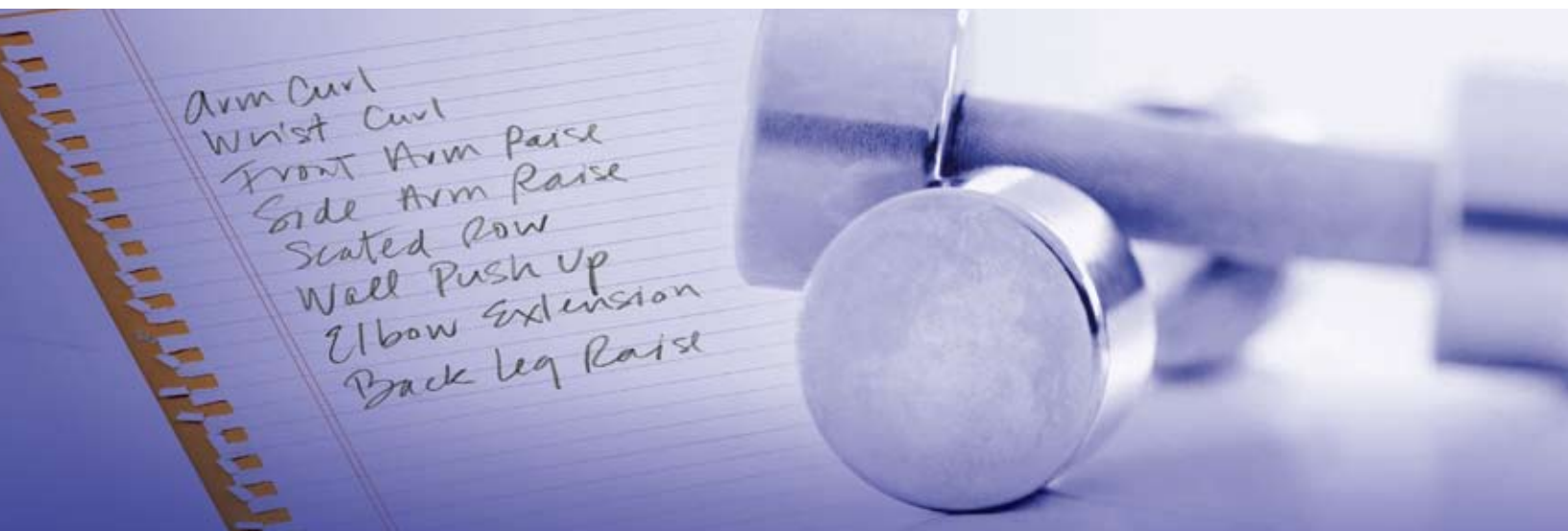
Overall, by incorporating the study of disease into their understanding of normal aging, BLSA scientists have been able to:

- *Quantify certain areas of natural, age-related decline and compare these declines with changes related to disease.* For instance, researchers have studied natural versus disease-related changes in muscle quantity and strength, how these changes may be associated with other age-related physical and chemical changes, and the impact of these changes on longevity and physical ability.
- *Build knowledge of the relationship between health risk factors and aging.* Scientists have observed that the value of risk factors to predict disease may change with age. In one example, researchers calculated if the risk for heart disease could be better predicted by waist circumference along with body mass index (BMI, a measure of body fat based on height and weight), rather than by BMI alone. Waist

circumference improved the predictive power of BMI for coronary risk in younger but not older people.

- *Track trends for behaviors that promote health or risk for disease.* In one BLSA study, scientists examined the dietary diaries of participants ages 27 to 88 from 1961 to 1987 to see how food choices changed over time. They found that in the late 1960's, fat and cholesterol in participants' diets declined while their consumption of fiber increased. Adults of all age groups followed this healthy eating trend. Older people were just as able as younger people to change their eating habits and benefitted from these changes as much as younger people.

Answering questions about aging and disease is still a priority for BLSA scientists. Understanding this connection may lead to recommendations that can counteract age-related decline in health status and promote healthy aging.



WHAT DOES ALL THIS MEAN FOR YOU?

Putting Research into Action

Over the years, BLSA scientists and other researchers from a broad range of disciplines have identified factors that influence healthy aging. From their research have come action steps we can take to maintain our health and function as we get older. From diet and physical activity to health screening and managing disease risk factors, these actions may influence different areas of our health.

The following review of selected findings from the BLSA and other studies describes in practical terms some of the evidence for actions that may lead to healthy aging. Not all the information will necessarily relate to your needs or fit with your lifestyle. But these findings will provide a context and general ideas for you to consider — and act on — as you think about your own aging. Before trying anything new, talk with your doctor about some of the approaches presented here to determine which might best apply to you.

Get Moving: Consider Exercise and Other Physical Activities

Some people love it, some people hate it, but regardless of your personal feelings, exercise and physical activity are good for you — period.

In fact, exercise and physical activity are considered a cornerstone to almost every healthy aging program. Emerging scientific evidence suggests that people who exercise regularly not only live longer, they live better. And, being physically active — doing everyday activities that keep your body moving such as gardening, walking the dog, and taking the stairs instead of the elevator — can help you to continue to do the things you enjoy and stay independent as you age.

Specifically, regular exercise and physical activity can reduce your risk of developing some diseases and disabilities that often occur with age. For instance, balance exercises help prevent falls, a major cause of disability in older adults. Strength exercises build muscles and reduce the risk of osteoporosis. Flexibility or stretching exercises help keep your body limber and give you the freedom of movement you need to do your everyday activities.



Exercise may even be an effective treatment for certain chronic conditions. People with arthritis, high blood pressure, or diabetes can benefit from regular exercise. Heart disease, a problem for many older adults, may also be alleviated by exercise. Scientists have long known that regular exercise causes certain changes in the hearts of younger people. These changes, which include lowering resting heart rate and increasing heart mass and stroke volume (the amount of blood pumped with each heart beat), make the heart a better pump. Evidence now suggests that people who begin exercise training in later life, for instance in their sixties and seventies, can also experience improved heart function. In one study, BLSA researchers observed a decrease in the risk of a coronary event, like a heart attack, in older male BLSA participants who took part in high intensity, leisure time physical activity like lap swimming or running.

In addition to benefits for the heart, studies also show that exercise helps breathlessness and fatigue in older people. Endurance exercises — activities that increase your breathing and heart rate — such as dancing, walking, swimming, or bicycling, increase your stamina and improve the health of your lungs and circulatory system as well as your heart.

There are many ways to be active. You can be active in short spurts throughout the day or you can set aside specific times of the day or specific days of the week to exercise. Many physical activities, such as brisk walking or raking leaves, are free or low-cost and do not require special equipment.

For more information about how to get started and stick with an exercise and physical activity

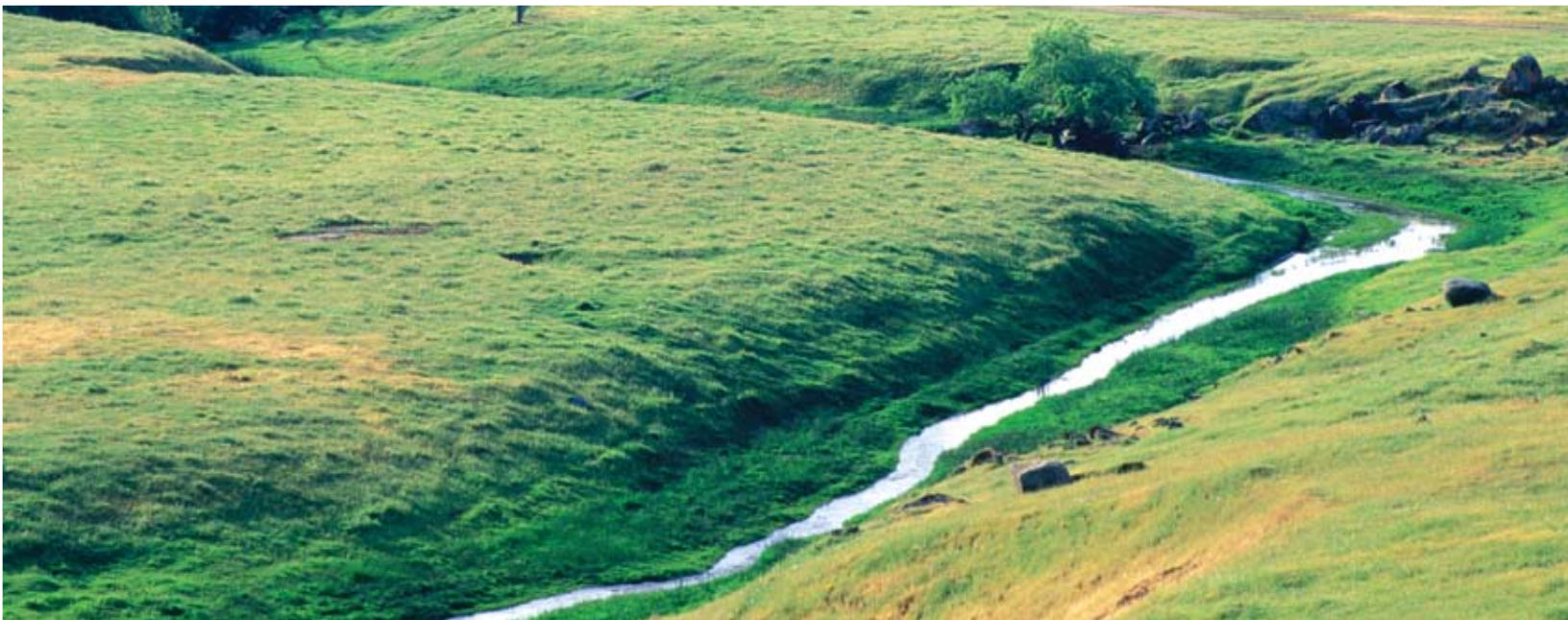
program, get a free copy of *Exercise and Physical Activity: Your Everyday Guide from the National Institute on Aging*. If you have a chronic health condition, you may want to talk to your doctor about your interest in physical activity and exercise. He or she may have some safety tips to accommodate any health problems you might have.

Pay Attention to Weight and Shape

Weight is a very complex issue. For older people, the health problems associated with obesity may take a back seat to problems associated with body composition (fat to muscle ratio) and location of fat (hip or waist) on the body.

Most of us know that many health problems are connected to being overweight or obese. People who are overweight (defined by a BMI of 25 to 29.9) or obese (a BMI greater than or equal to 30) are at greater risk for type 2 diabetes, high blood pressure, heart disease, stroke, some types of cancer, sleep apnea (when breathing stops for short periods during sleep), and osteoarthritis (the wearing away of joints). But data show that for older adults, thinner is not always healthier, either. In one study, researchers found older adults who are thin (a BMI less than 19) have a higher mortality rate compared to those who are obese or of normal weight. In another study, women with a low BMI had an increased risk of mortality. Being, or becoming, thin as an older adult can be a symptom of disease or an indication of developing frailty. Those are possible reasons why some scientists think maintaining a higher BMI may not necessarily be bad as we age.





For some older adults, problems associated with body composition can be more dangerous than obesity alone. For instance, one study compared older adults with sarcopenic obesity — a deficiency in skeletal muscle mass and strength as well as a high percentage of body fat — with obese older adults without sarcopenia and with lean older adults with skeletal muscle deficiencies. Scientists found older adults with sarcopenic obesity to have an increased risk of disability for doing instrumental activities of daily living (IADLs). Sarcopenic obesity interfered with the ability to perform such tasks as using the telephone, accessing transportation, getting groceries, making meals, doing housework, and managing money.

Body fat distribution, specifically waist circumference and waist-to-hip ratio, can also be a serious problem for older adults. We know that the “pear” shape, with body fat in peripheral areas such as the hips and thighs, is generally healthier than the “apple” shape, with fat around the waist. Being apple shaped can increase risk of heart disease and possibly breast cancer. According to BLSA research, with age, the pattern for body fat can shift from safer peripheral areas to the abdominal area of the body. BLSA researchers examined 547 men and women over a 5-year period to observe body measurement changes. They found that men



predominantly shifted in waist size while women showed nearly equal changes in waist and hip measurements. The men developed a more dangerous body fat distribution, even though women carried more total body fat. This may help explain why men generally have a higher incidence of certain diseases and a shorter lifespan.

So is there a “normal” weight range or pattern for healthy aging? For older adults, one size does not fit all.

On one hand, when deciding whether or not to lose weight, there are a variety of risk factors to consider: high blood pressure (hypertension); high LDL cholesterol (“bad” cholesterol); low HDL cholesterol (“good” cholesterol); high triglycerides; high blood glucose (sugar); family history of premature heart disease; physical inactivity; and cigarette smoking. The National Heart, Lung, and Blood Institute guidelines recommend weight loss for people who are considered obese or overweight and have two or more of these risk factors. Even a small weight loss (just 10 percent of your current weight, for example 16 pounds if you weigh 160 pounds) can help to lower the risk of developing diseases associated with obesity.

On the other hand, it is normal for people to gain some weight with age. While extra weight — especially around the waist or accompanied by loss of skeletal muscle mass — can cause health risks, losing weight may not be a good idea for some older adults. For example, it may be more important for people who are pear shaped and have less than two of the risk factors described above to prevent weight gain rather than try to lose weight. One group of researchers found that involuntary and even voluntary weight loss, regardless of BMI, can actually increase an older adult’s risk of

JEANETTE WRIGHT

I have been working
with the Baltimore

Longitudinal Study of Aging in the cardiovascular labs since August 23, 1982.

From the time I started with the study to the present, I have seen the BLSA change the way society reacts and responds to research. The BLSA has truly spread into a large realm of health care areas concerning the aging process, helping to amend views of aging. The research is important to everyone, but especially to the growing numbers of participants ranging from 60 years and older.

Our BLSA participants are viewed and treated as family members, not study groups. In turn, they often leave one visit looking forward to the next. Many have stated that they would never get this type of testing and concern from their primary care providers. To me, this speaks volumes about the staff of the BLSA.

Over the past 26 years, I personally have valued the relationships I've developed with participants. It is the BLSA participants who keep us looking ahead and growing each and every day. Their unselfish participation and willingness to stay with the study year after year allow us to continue our research and hopefully make a difference in the community of health care. Thank you to the participants.



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mortality. In another study, scientists had similar findings, reporting that weight change (loss or gain) is associated with mortality risk.

While we have learned a lot about patterns of weight and aging, watching your weight as you age is very much an individual matter. Talk to your doctor about any weight concerns, including decisions to lose weight or if you notice unexplained weight changes.

Healthy Food for Thought: Think About What You Eat

You may have heard of the French saying “tell me what you eat and I will tell you what you are” or the shortened American version “you are what you eat.” The insight in both of these sayings speaks to an interplay between food and health. What you eat can either support healthy aging or cause health problems. NIA scientists along with other investigators have found certain components of food, like saturated fats, cholesterol, and *trans* fats, may increase the risk of age-related disease, whereas foods like vegetables, fruits, fish, and nuts may have health benefits.

This booklet has already discussed how weight and body composition may play a role in how people age. Food has been shown to be an

important part of that equation. In one BLSA study, scientists investigated how dietary patterns influenced changes in BMI and waist circumference, risk factors, again, for many diseases. Scientists grouped participants into clusters based on what foods contributed to the greatest proportion of the calories they consumed. BLSA participants who had a pattern of eating “meat and potatoes” had a greater annual increase in BMI, and participants in the “white-bread” pattern had a greater increase in waist circumference compared to those in the “healthy” cluster. “Healthy” eaters had the highest intake of foods like high-fiber cereal, reduced-fat dairy, fruit, nonwhite bread, whole grains, beans and legumes, and vegetables, and low intake of red and processed meat, fast food, and soda. This same group had the smallest gains in BMI and waist circumference.

Scientists think there are likely many factors that contribute to the relationship between diet and changes in BMI and waist circumference. One factor may involve the glycemic index value (sometimes called glycemic load) of food. Foods with a low glycemic index value (such as most vegetables and fruits and high-fiber, grainy breads) decrease hunger but have little effect on blood sugar and therefore are healthier. Foods like white bread have a high glycemic index value and tend to cause the highest rise in blood sugar.

Scientists have also used BLSA data to look at how the diet of male participants influenced risk of mortality from coronary heart disease (CHD) — the leading cause of death for people age 65 and over. Researchers studied the protective effects of eating fruits and vegetables along with the harmful effects of eating saturated fat. As expected, they observed that people who ate





fruits and vegetables, particularly vegetables, had proportionately (based on amount of fruits and vegetables consumed) less coronary heart disease mortality. Participants with diets high in saturated fat had proportionately greater risk of CHD death and, conversely, participants on a low saturated fat diet had a lower risk of CHD death. A diet rich in fruits and vegetables and low in saturated fat was even more effective in decreasing risk. These BLSA findings are supported by data from many similar studies.

In addition to the BLSA, other NIA-supported researchers have studied the connection between food and health. For example, the relationship between physical problems and micronutrient or vitamin deficiency is one area of focus. Low concentrations of micronutrients or vitamins in the blood are often due to poor nutrition. A low carotenoid concentration, which can result from not eating enough fruits and vegetables, is associated with a heightened risk for a decline in skeletal muscle among older adults. Low concentration of vitamin E in older adults, especially women, is correlated

with a decline in physical function. When compared to other older adults, those with low vitamin D levels had poorer results on two physical performance tests. Women with a low vitamin D concentration were more likely to experience back pain. These studies provide support for the takeaway message: the nutrients you get from eating well can help keep muscles, bones, organs, and other parts of the body strong throughout life.

So, eating well is not just about your weight, it can also help protect you from certain health problems that occur more frequently among older adults. And, eating unhealthy foods can increase your risk for some diseases. If you are concerned about what you eat, talk with your doctor about ways you can make better food choices. You may also want to visit www.MyPyramid.gov, a website developed by the U.S. Department of Agriculture (USDA), offering personalized eating plans, tools to help you plan and assess your food choices, and other advice to help you make healthy food choices.

DENISE MELVIN

I have been with the BLSA since April of 2001.

I am a Clinical Research Nurse and work closely with the endocrine group. We have been studying the hormone response to the “tasty” orange-flavored drink used for the Oral Glucose Tolerance Test and how hormones are related to diabetes.

I believe that what we know about aging from the BLSA will help lead to future discoveries that will help all generations live healthier and improve and maintain their quality of life.

The testing we do is precise and uses state-of-the-art equipment geared toward studying the aging process. Furthermore, the physicians involved in reviewing data and examining the participants are of the highest caliber, extremely knowledgeable, and very respected in their fields.

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People are always talking about age 50 as the new 40, and 70 as the new 60. I see that every day here with the BLSA participants. They share with us their new and exciting endeavors, including classes they are taking,

world travel, and other life experiences. It is amazing to see how some of our oldest participants have adapted to technology by using computers and e-mail. I am inspired by 80- and 90-year-olds who are routinely doing more exercise than me. I especially admire women of that age group who attended college, raised families, and have contributed so much to our society.

It is a pleasure working with the BLSA participants. You encourage me in so many ways. Happy 50th, and thank you for the contribution of your time and patience!

Participate in Activities You Enjoy

Sure, engaging in your favorite activities can be fun or relaxing, but did you know that doing what you like to do may actually be good for your health? It's true. According to BLSA data, people who are sociable, generous, and goal-oriented report higher levels of happiness and lower levels of depression than other people. Research from other studies supports this observation.

People who are involved in hobbies and social and leisure activities may be at lower risk for some health problems. For example, one study followed participants for up to 21 years and linked leisure activities, like reading, playing board games, playing musical instruments, and dancing, with a lower risk for dementia. In another study, older adults who participated in social activities (i.e., played games, belonged to social groups, attended local events, travelled) or productive activities (i.e., had paid or unpaid jobs, cooked, gardened) lived longer than people who did not report taking part in these types of activities.

Other studies have found that older adults who participate in what they see as meaningful activities, like volunteering in their community, reported feeling healthier and happier. Programs like the Experience Corps® are testing this idea, with promising preliminary outcomes. The Experience Corps® is a community-based program that places older adult volunteers living in an urban setting in public elementary schools for approximately 15 hours a week. Results suggest that the first group of Experience Corps® volunteers (living in Baltimore, Maryland) had an

PARTICIPATE IN YOUR HEALTH CARE

Another component of participation is taking an active role in your health care. This means continually learning about how you can stay healthy. Websites like www.nia.nih.gov, www.nih.gov, medlineplus.gov, and nihseniorhealth.gov provide up-to-date, trustworthy health information. NIHSeniorHealth.gov is an example of a senior-friendly website with special features that make it easy to use. You can have the text read out loud or make the type larger.

increase in physical, social, and cognitive activity levels, which might decrease their risk for disability, dependency, and dementia in later life. In addition to physical health benefits, volunteers reported feeling personal satisfaction from their experience.



STAYING HEALTHY AT 50+

Adapted from information provided by the Agency for Healthcare Research and Quality; based on research findings from the U.S. Department of Health & Human Services and the U.S. Preventive Services Task Force.

DAILY STEPS TO GOOD HEALTH

- Be tobacco free.
- Be physically active.
- Eat a healthy diet.
- If you drink alcohol, drink only in moderation.

SCREENING TESTS AND PREVENTIVE MEDICINE

Heart and Vascular Diseases

- Aspirin to prevent heart attack:
Men at risk* — Ages 50 to 80.
- Aspirin to prevent stroke:
Women at risk* — Ages 55 to 80.
- Abdominal Aortic Aneurysm Screening Test:
Once for men who have smoked —
Ages 65 to 75.
- Blood Pressure Screening Test: All men and women — Ages 50 and older, at least every 2 years.
- Cholesterol Screening Test: All men and women — Ages 50 and older.
- Diabetes Screening Test: Men and women — Ages 50 and older with high blood pressure.

Cancer

- Breast Cancer Screening (Mammogram):
All women — Ages 50 and older,
every 1 to 2 years.

- Breast Cancer Preventive Medicines:
Women at risk* — Ages 50 to 80.
- Cervical Cancer Screening (Pap Test):
All women — Ages 50 to 65, at least every 3 years.
- Colorectal Cancer Screening Test:
All men and women — Ages 50 and older.

Bone Disease

- Osteoporosis Screening (Bone Density Scan):
Women at risk* — Ages 60 to 65,
and all women — Ages 65 and older.

Sexual Health

- HIV and Sexually Transmitted Infection Screening Tests: Men and women at risk* — Ages 50 and older.

Mental Health

- Depression Screening: All men and women — Ages 50 and older.

Immunizations

- Flu Vaccine: All men and women — Ages 50 and older, annually.
- Other Vaccines: You can prevent some serious diseases, such as pneumonia, whooping cough, tetanus, and shingles, by being vaccinated. Talk with your doctor or nurse about which vaccines you need and when to get them.

*Being at risk means that you may be more likely to develop a specific disease or condition. Whether you are at risk depends on your family history, things you do or don't do (such as exercising regularly or using tobacco), and other health conditions you might have (such as diabetes). If you think you might be at risk for a specific disease, talk with your doctor.

BLSA'S IDEAL FUTURE

We have learned a great deal from the BLSA and a growing body of aging research. But there is much more to explore. In 2009, while continuing other areas of research, the BLSA will begin to examine the genetic, environmental, social, and behavioral factors that preserve health and function for a rare fraction of the oldest old adults. The BLSA has developed the Insight into the Determinants of Exceptional Aging and Longevity (IDEAL) study, which will focus on people 80 years and older who are living free of physical and cognitive disease. Taking advantage of research strategies already standard for the BLSA, the aim of the new study is to identify factors that distinguish extraordinary health at very advanced age from non-“ideal” aging. Further, IDEAL aims to discover the physiological, environmental, and behavioral risk factors that result in the loss of exceptional aging status over time. Although research exists on the relationship between long life and functional decline, we still know relatively little about why certain individuals have excellent health well into their eighties while others experience disease and physical decline earlier in life.

Previous research findings looked at whether or not long life and healthy aging are familial traits. The National Heart, Lung, and Blood Institute’s Twin Study, for instance, found extreme longevity has a relatively low inheritance (about 20 percent, although the genetic effect tends to be higher at older ages) while maintaining physical function in late life appears highly inheritable (50 to 60 percent). However, the study did not identify the specific factors contributing to longevity and healthy aging.

According to the NIA-supported New England Centenarian Study, centenarians (individuals 100 years and older) can be divided into three groups: “survivors,” 42 percent of the study population; “delayers,” 45 percent of the study population; and “escapers,” 13 percent of the study population. Survivors had an age-related disease before age 80, delayers were not diagnosed with an age-related disease until after age 80, and escapers reached year 100 without ever having an age-related disease. In the IDEAL study, scientists will focus on individuals able to delay or evade disease and disability into their eighties — the delayers and the rare escapers.

The IDEAL study will offer a greater understanding of the mechanisms that are important to exceptional aging. There are many potential benefits of the IDEAL study:

- Scientists will be able to study traits that have long been of interest to the research community.
- Studying these participants over time will provide data needed to compare the delayers, who eventually develop disability, and the evaders, who never become disabled.
- Identifying factors that lead to “ideal” aging may be used to develop strategies for improving the health of all people as they get older.

In short, the IDEAL study continues the BLSA’s research interest in advancing what is known about healthy aging. Findings from this study perhaps will translate into actions that preserve health and physical function for very long-lived individuals.

DR. JEFF METTER

I have been with the BLSA since 1987, when I was hired as the study physician. During my

time with the study, I have seen the BLSA make a number of changes to adapt to shifting times, research questions, and needs. The early years of the study focused on understanding the dynamic changes that occur within individuals as they age. In doing so, the BLSA made major contributions to our understanding of how individuals age and characterizing the aging process. As the study matured and our understanding of aging increased, research

questions gradually began to examine the transitions between aging and disease.

I came to the BLSA from the Veterans Administration, where I was the physician on a chronic care ward, specializing in stroke and neurological disease. What was most striking to me at the time was the vitality of many elderly members of the BLSA as compared to those I knew from the VA. Individuals in their seventies and eighties were active, running businesses, and participating

in activities not normally associated with older adults. In more recent years, I have seen people in their eighties and nineties with the same level of energy that I once observed in 70- and 80-year-olds. What I wonder now is whether our older population is healthier and more robust or I am now older and observing others in a different light. It is probably both.

Thank you to the BLSA participants for your efforts and commitment. The study would not exist without you.

...the BLSA made major contributions to our understanding of how individuals age and characterizing the aging process.

TAKING STOCK, LOOKING AHEAD

When the BLSA began in 1958, the post-war baby boom was just becoming a phenomenon. With the oldest members of that baby boom cohort now approaching their 65th birthday, the founders of the BLSA can be credited with impeccable timing – they somehow knew that the need to understand how we grow older would become increasingly important to both individuals and society.

Over its 50 years, discoveries from the BLSA have helped to transform the way we conceptualize aging. Just like the people it studies, as the BLSA gets older, some things have changed and some remain the same. New research questions and study designs have emerged, but the BLSA remains true to its goal to distinguish normal aging from disease.

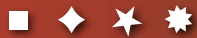
Today, increasing numbers of individuals are reaching extreme old age while maintaining good health and functional status. The BLSA, by focusing on these individuals, will carry on its original groundbreaking approach by asking – can we indeed directly affect the aging process? Understanding why some people are resistant to disease and functional decline and identifying ways to stay healthy are the challenges for the future. With the help of study participants, the BLSA will address these questions. The answers may set in motion new ways to live healthier and longer than ever before.



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