Urging Congress and the President to Restore a National Commitment to Medical Research

The Task Force on Aging Research Funding is a nonpartisan alliance of disease groups, patient advocates, and foundations committed to advancing biomedical research to improve the health of the aging American population. Since 1988, our report has served as a tool to assist policymakers in establishing funding levels necessary to achieve this goal.
Efforts to reform the American health care delivery system are underway, as greater stresses are felt in response to the aging U.S. population. In January 2011, baby boomers will begin turning age 65 in record numbers. Chronic diseases associated with aging afflict 80% of the 65+ population and account for over 75% of Medicare and other federal health expenditures. Unprecedented increases in age-related diseases are one reason the Congressional Budget Office projects that total spending on healthcare will rise to 25% of U.S. gross domestic product (GDP) by 2025—it is 17% of GDP today.

The Obama Administration is addressing the dual challenge of extending health coverage while restraining demand for health care services and costs. As Congress weighs in, the national debate will bring many wrenching questions and choices to light. Above all we must avoid policies that pit generations of Americans against one another or institute harsh rationing that would deny patients’ needs. The not-for-profit and advocacy organizations that comprise the Task Force on Aging Research Funding believe a renewed commitment to biomedical and public health research, and its potential to extend years of healthy aging is essential for effective, balanced, and wise national health policy.

Research that can be translated quickly into effective prevention and efficient health care will reduce the burden of a “Silver Tsunami” of age-associated chronic diseases. Breakthroughs from research can lead to treatments and public health interventions that could delay the onset of costly conditions such as heart disease, stroke, diabetes, bone fractures, age-related blindness, Alzheimer’s and Parkinson’s diseases. Such advances could save trillions of dollars by the middle of the current century.

President Obama’s response to the current economic dilemma includes steps to restore U.S. prosperity through a sustained investment in science and technology. The National Institutes of Health (NIH) has received a healthy infusion of funds through the recently enacted federal economic stimulus. However, this is a temporary measure to increase productivity of science projects and will last only two years. The current Omnibus Appropriations Bill for fiscal year 2009 signals a positive step in the right direction for strengthening the NIH.

We must continue to support the NIH and other agencies engaged in efforts to promote healthy aging. The NIH is often called “the jewel in the crown” of America’s contribution to the health of its people and the world. However, due to flat funding for NIH over the last five years, spending for medical research has declined by as much as 17%. The NIH accounts for 80% of all the non-profit medical research in the country. NIH support generates jobs, patents on new products, licenses and royalties that underpin U.S. global leadership in biotechnology and medical technology. A financially healthy NIH is critical to a healthy U.S. economy, and to the health of its people.

The member groups of the Task Force on Aging Research Funding call on the Obama Administration and Congress to provide sustained support for medical research through the NIH by increasing its current budget by at least 7% in fiscal year 2010 to address specific age-related health concerns of an aging population.
ALZHEIMER’S DISEASE

- The National Institute on Aging (NIA) estimates that between 2.4 million and 4.5 million Americans have Alzheimer’s disease—a progressive degenerative disorder that attacks the brain’s nerve cells, resulting in loss of memory, thinking and language skills, behavioral changes, and ultimately, death.

- Alzheimer’s disease is not a normal part of aging; however, age is the greatest known risk factor with the incidence doubling for every five year interval beyond age 65. With the older population on the threshold of a boom, Alzheimer’s disease is an especially significant issue—the number of people age 65 and older is expected to double from 36 million in 2003 to 72 million in 2030.

- Alzheimer’s disease drains more than $148 billion from the nation’s economy each year. If the prevalence of Alzheimer’s disease continues to increase as expected, the $91 billion spent in 2005 on Medicare costs for care of individuals with Alzheimer’s disease and dementia patients is projected to increase to $189 billion by 2015.

- Alzheimer’s disease also exacts a huge toll on caregivers—87% of whom are caring for relatives. 1 in 4 provide constant care, 40 or more hours per week, often doing so for many years. More than 40% report high levels of emotional stress, 1 in 5 dementia caregivers are in fair or poor health, and 1 in 3 caregivers have symptoms of depression. Many family caregivers must also sacrifice other obligations such as work—14% give up work or choose early retirement, and 13% cut back on their hours.

- Currently, there is no cure for Alzheimer’s disease and no treatments that stop or reverse its progression. However, there are a number of drugs that may help slow the progression of symptoms such as cognitive loss, improve quality of life for patients and their caregivers, and in some cases delay the need for nursing home care.

- A growing body of research indicates that healthy lifestyle choices, such as physical and mental exercise, stress management, controlling obesity and cardiovascular disease, promote successful aging generally and may help prevent the development or advance of Alzheimer’s disease.

- NIH-supported researchers and private sector researchers are poised to make major breakthroughs in predicting and treating Alzheimer’s disease. One NIH-funded study found that an Alzheimer’s vaccine is effective in clearing beta-amyloid plaques that form in the brain as Alzheimer’s progresses. While the vaccine is not the silver-bullet cure many hoped for, it is a good first step in treatment, especially when used in combination with complimentary restorative treatments. A new method of detecting Alzheimer’s disease by passing near-infrared light through the skull has also had preliminary success. Early detection is an important advantage in fighting Alzheimer’s, allowing patients to aim at preventing further development rather than restoring damage.
ARTHRITIS

- Arthritis is a general term for a group of more than 100 joint inflammation diseases. The most common type of arthritis is osteoarthritis. Other common types include rheumatoid arthritis, and gout. Nearly 1 in 5 adults have been diagnosed with some form of arthritis—around 46 million Americans. By 2030, an estimated 67 million adults in the U.S. are projected to have doctor-diagnosed arthritis.

- Arthritis is one of the most prevalent chronic health problems in the U.S. and is the most common cause of disability. Nearly 19 million U.S. adults report activity limitations because of arthritis each year.

- Each year, arthritis results in 992,100 hospitalizations and 44 million outpatient visits.

- Arthritis and related conditions cost the U.S. $128 billion every year in both direct medical costs and indirect costs from lost productivity.

- Arthritis makes it more difficult for people to be physically active, and not being physically active is a risk factor for many chronic diseases. More than half of adults with diabetes or heart disease also have arthritis. To effectively manage chronic conditions such as diabetes, heart disease, and obesity, people with arthritis need help finding ways to overcome arthritis-specific barriers to physical activity.

- With the recent development of more effective arthritis medicines, the future of treatment focuses on prediction, preemption, and personalized treatments. Researchers hope that genetic markers will soon be used to identify risk factors in patients, and are also developing methods to recognize environmental and other triggers that initiate the disease in susceptible people. Treatment strategies employ pharmagenomic and toxicogenomic approaches to identify the safest and most effective options for patients based on the monitoring of the disease risk, onset, activity, damage and progression of the arthritis.

- Some NIH-funded researchers are developing methods for engineering healthy pieces of cartilage that would replace damaged tissue following injury but before sustained joint damage. This replacement cartilage would be grown from the patient’s own cells, preventing any risk of tissue rejection.
Autoimmune diseases are a family of chronic, and often disabling, illnesses that result from a dysfunction of the immune system and that cause the body to attack its own cells, tissues, and organs. Lupus, multiple sclerosis, rheumatoid arthritis, type 1 diabetes, autoimmune thyroid diseases, myasthenia gravis, and scleroderma are some of the more than 80 autoimmune diseases.

Autoimmunity is the second leading cause of chronic illness in the U.S., and approximately 50 million Americans—1 in 5 people—have an autoimmune disease.

Autoimmune diseases disproportionately affect women; 3 of 4 people suffering from autoimmune diseases are women, and autoimmune diseases are among the 10 leading causes of death for young and middle-aged women. For some diseases, such as lupus and thyroiditis, more than 85% of affected individuals are women.

Most autoimmune diseases do not yet have a cure so those afflicted often face a lifetime of illness and treatment, debilitating symptoms, loss of organ function, reduced productivity at work, and large health care costs. Each year, autoimmune diseases cost the U.S. approximately $120 billion in health care costs.

In 2005, the NIH Autoimmune Diseases Coordinating Committee released a report to Congress detailing progress and research priorities in autoimmune disease research. The report identified major research areas including biomarker development, bioinformatics, and the application of new technologies such as genomics and proteomics. Despite significant progress, additional research is needed to gain a better understanding of genetic and environmental factors that contribute to autoimmune disease, apply knowledge gained by the Human Genome Project in revealing hereditary risks, and develop effective prevention strategies that arrest the autoimmune process.

In addition to this, the National Institute of Allergy and Infectious Disease (NIAID), part of NIH, has several programs that encourage comprehensive research and clinical trials of potential autoimmune disease therapies, such as the Autoimmunity Centers of Excellence, which focus on prevention strategies.
Understanding when and how changes occur as we age provides us with important clues for developing interventions that will prevent and treat diseases, and improve quality of life.

The only approach that scientists have found to-date that increases longevity in mammals is to reduce calorie intake by about one-third.

Caloric restriction has been shown to extend the average life spans of worms, insects and mice up to 30-40%, and is showing great promise in primate studies. These studies are raising the hope that further studies of caloric restriction will uncover the mechanisms responsible for age-related diseases.

Scientific research into telomeres, the repeating sequences of genetic material at the tips of chromosomes that shorten each time a cell divides, may hold the key to understanding cell replication and cellular aging. These DNA sequences may function as a “clock of aging.”

Researchers studying aging in nematodes (roundworms) have found that by altering certain genes, they can substantially extend the normal lifespan of these tiny organisms. This exciting research may lead to the discovery of the genetic and biologic secrets to longevity in humans.

Scientists are working to determine what “longevity genes” are and how they work. There may be a group of genes in each species that can extend life beyond what is presently considered maximum life span. These longevity-enabling genes could open the gateway to understanding the roots of biological aging in humans and provide revolutionary cures in treating age-related diseases.

The National Institute on Aging (NIA) has a broad research portfolio and studies the normal changes associated with aging as well as promising interventions for detecting, preventing, and treating many age-related diseases such as Alzheimer's disease, Parkinson's disease, and osteoporosis. This research is becoming especially urgent as our older population rapidly increases with the aging of the Baby Boom generation.
Osteoporosis is a disease characterized by low bone mass and deterioration of bone tissue that leads to bone fragility and an increased risk of fracture from falls or simple daily actions, like sneezing. An estimated 34 million Americans have low bone mass or osteopenia, which puts them at risk for osteoporosis and bone fractures. In addition, 10 million Americans have osteoporosis.

Osteoporosis is under-recognized and under-treated. If current trends continue, more than 61 million people will be affected—47 million will have low bone density and another 14 million will have osteoporosis by 2020.

Osteoporosis predisposes older adults to fractures, contributing more than 2 million fractures in 2005, of which there were nearly 300,000 hip fractures, 550,000 vertebral fractures, 400,000 wrist fractures, and 675,000 fractures at other sites. About 70% of osteoporosis related fractures occur in the 65 and older population. A recent study estimates that in the next two decades, an estimated 3 million Americans will suffer from osteoporosis related fractures—a 50% increase from the 2005 figure.

1 in 2 women and up to 1 in 4 men, over the age of 50, will have an osteoporosis-related fracture during their lifetime. An average of 24% of hip fracture victims die within a year of the fracture. For patients who were ambulatory before a hip fracture, 20% require long-term care afterwards and half will never be able to walk again without assistance.

The estimated national direct care expenditures (including cost of hospitals, nursing homes, and outpatient services) for osteoporotic fractures was $19 billion dollars in 2005—of these total costs, hip fractures accounted for about 72%. Experts predict that these costs will rise to about $25.3 billion by 2025.

The National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS) supports genome-wide association studies (GWAS) to better understand genetic risk factors of osteoporosis. NIH-funded researchers are also exploring and developing new diagnostic tools to assist existing bone mineral density (BMD) measures that assess the relationship between bone architecture and fracture risk. Better screening tools would allow a larger proportion of those at risk to engage in preemptive treatments and preventive strategies.

Paget’s disease of bone is a condition that primarily affects middle-aged and older persons and is the second most prevalent bone disease after osteoporosis. An estimated 1 million people in the U.S. have Paget’s disease. When severe, Paget’s disease can be extremely painful and can cause significant deformity and complications including hearing loss, bowing of limbs, neurological problems, and arthritis. There are medical therapies available but more research is needed to understand the causes of the disease.
Cancer continues to be the second leading cause of death in the U.S., exceeded only by cardiovascular disease. Cancer accounts for 1 in every 4 deaths in the U.S. In 2008, more than 1.43 million new cases of cancer were expected to be diagnosed and an estimated 565,650 Americans were expected to die from their cancer—more than 1,500 people a day.

Age is the largest single risk factor for developing cancer. About 77% of all cancer cases are diagnosed in individuals age 55 and older. About 64% of all prostate cancer cases occur in men age 65 and older and 80% of all breast cancer cases occur in women over age 50. As our population continues to age, a doubling of cancer diagnosis is predicted—from 1.3 million in 2000 to 2.6 million in 2050. The number of cancer patients age 85 and older is expected to increase four-fold.

Men have slightly less than a 1 in 2 lifetime risk of developing cancer. The leading cancer sites in men are the prostate, lung and bronchus, and colon and rectum. Women have a little more than a 1 in 3 lifetime risk of developing cancer. The leading cancer sites in women are the breast, lung and bronchus, and colon and rectum.

The NIH estimated that the overall cost of cancer in 2007 was $219.2 billion. This figure includes $89.0 billion in direct medical costs, $18.2 billion in indirect morbidity costs, and $112 billion in indirect mortality costs. The National Cancer Institute (NCI) estimates that the total economic burden of cancer in the U.S. will increase to $1.82 trillion by 2017.

NIH-sponsored research has produced significant health and economic benefits. Cancer mortality is decreasing due to the impact of prevention, early detection, and more effective treatments. The 5-year survival rate for all cancers has improved from 50% from 1974-1977 to 66% from 1996-2003. These health gains produce huge economic consequences—a modest decrease of 1% in cancer mortality has been estimated to be worth $500 billion in social value.

Continued developments in molecular biology, immunology, and genetic research—specifically, genomics, proteomics, and pharmacogenomics—will lead to tremendous advances in cancer prevention, diagnosis, and treatment. Cancer diagnosis is also evolving, the focus shifting to evaluation of an individual’s genetic makeup to detect susceptibility to particular cancers.

There is growing emphasis on understanding the molecular mechanisms of a patient’s tumor which may provide valuable information relating to more appropriate treatment strategies and greater understanding of the likelihood of recurrence. The field of cancer genomics will also assist researchers and clinicians in understanding how to improve the prevention, early detection, diagnosis, and management of cancer. The burgeoning information from the genomics area will greatly impact both the design of and targeted recruitment for clinical trials.
CARDIOVASCULAR DISEASE

- Cardiovascular disease (CVD), including heart attack and stroke, remains the nation’s number one killer of men and women, causing more than 35% of all deaths. Each year nearly 870,000 Americans die from CVD—nearly 2,400 deaths every day—or 1 death every 37 seconds. A normal American’s probability at birth of eventually dying from a major CVD is 47%.

- An estimated 80 million Americans adults have 1 or more types of CVD and more than 38 million of them are age 60 and older. As the baby boomers age, deaths from heart disease are projected to increase 2.5 times faster than the population as a whole, and the prevalence of heart disease is projected to increase by 16% each decade.

- Cardiovascular disease remains the most frequent cause of hospitalization. At ages 40 to 69 about 7% of male and 12% of female heart attack survivors will be disabled with heart failure within 5 years.

- The estimated direct and indirect cost of CVD for 2009 is $475 billion. The aging of the population alone is projected to drive up costs for CVD 54% by 2025.

- Approximately 1 in 3 adults has high blood pressure (HBP) which, if not properly diagnosed and treated, can lead to heart failure, heart attack, stroke, and kidney disease. The recent National Heart, Lung, and Blood Institute (NHLBI)-supported Antihypertensive and Lipid-Lowering Treatment to Prevent Heart Attack Trial, the largest clinical trial designed to study drug treatments for HBP, revealed that low-cost diuretics are as effective as more expensive drugs in lowering blood pressure and preventing complications.

- Perhaps the most effective measures for preventing CVD are behavioral and relate to diet and physical activity. For example, NHLBI-supported studies have shown that the DASH (Dietary Approaches to Stop Hypertension) diet and the TLC (Therapeutic Lifestyle Changes) program can help lower blood pressure and cholesterol.

- Research also shows that noninvasive magnetic resonance imaging (MRI) technology can improve the diagnoses of heart attacks by allowing for faster, more accurate detection in the emergency room. Use of MRI will save lives and reduce disability among survivors by allowing for quick diagnosis and treatment.
Chronic obstructive pulmonary disease (COPD) is a term that includes chronic bronchitis, chronic obstructive bronchitis, or emphysema, or combinations of these conditions. COPD is characterized by obstruction to airflow that interferes with normal breathing and causes a gradual loss of lung function.

COPD is the fourth leading cause of death in the U.S.—killing about 120,000 people each year and over 127,000 in 2005 alone. As of 2006, more than 12.1 million Americans had been diagnosed with COPD and an additional 12 million are believed to have the disease but have not been clinically-diagnosed.

COPD is a major cause of hospitalization in the older population—approximately 65% of hospital discharges due to COPD in 2005 were in the 65 and older population, or nearly 470,000. It also has a significant impact on quality of life with 51% of COPD patients saying that it limits their ability to work and 70% reporting limitations in normal physical exertion.

The annual cost of COPD in 2007 was approximately $42.6 billion—$26.7 billion in direct health care expenditures, $8 billion in indirect morbidity costs, and $7.9 billion in indirect mortality costs.

Available treatments including bronchodilators, inhaled corticosteroids, pulmonary rehabilitation, and oxygen therapy, can control symptoms and prolong life. However, none of the existing treatments modify the long-term decline in lung function that is typical of the disease. Treatments that provide better symptomatic relief and prevent progression of the disease are a high priority at the National Heart, Lung, and Blood Institute (NHLBI) of the NIH. In 2008, the NIH also launched a national public awareness campaign “Learn More Breathe Better.”

Current research has found that 10-20% of those who suffer from COPD have never smoked, spurring research to discover the genetic and environmental factors involved in the disease. The NIH supports several research initiatives aimed at COPD, including the COPD Clinical Research Network and the Lung Tissue Research Consortium. Current clinical studies include research on the effects of supplemental oxygen in patients with less severe COPD, and a laboratory investigation of lung tissues samples of COPD patients.
The use of complementary and alternative medicine (CAM) in the U.S. is widespread. People use CAM to treat a number of diseases and conditions and are most likely to use it for back pain, colds, neck pain, joint pain, arthritis, anxiety or depression, stomach upset, headache, recurring pain, and insomnia. The most commonly used natural products are echinacea, ginseng, gingko biloba, garlic supplements, glucosamine, St. John’s wort, peppermint, fish oils, ginger supplements, and soy supplements.

A study conducted by researchers at the University of Maryland that looked at osteoarthritis in the elderly, found that acupuncture helped 7 out of 29 patients avoid surgery that would have cost an estimated $63,000 per person.

Another study, conducted by investigators at the University of Texas, found that almost half of women who discontinued hormone therapy for menopause but still had symptoms turned to complementary and alternative medicine for relief. These included vitamin and calcium supplements, an herbal supplement known as black cohosh, soy supplements and foods.

The Internet is a common source of health information and consumers often go on-line to get information concerning their health or the health of their loved ones. Unfortunately, a study of Internet marketing of herbal products found that 81% of sites that sold an herbal product or directly linked to a vendor, made direct health claims yet lacked clinical information or FDA advisories. Consumer awareness about CAM therapies and health claims must be raised in the future.

The National Center for Complementary and Alternative Medicine’s (NCCAM) research agenda is aimed at supporting basic, translational and clinical research. Two main collaborative activities will demand the most attention into 2009: the first is CAM Approaches in the Management of HIV Disease and its Complications, part of the Trans-NIH Plan for HIV-Related Research; and the second is conducting evidence-based reviews of CAM therapies in partnership with the CDC and AHRQ. Ongoing priorities include understanding the underlying mechanisms of CAM therapies to facilitate integration into conventional medical care, identification of key study endpoints for use in clinical trial design, and studies on the use of CAM in the treatment of cardiovascular disease, depression, respiratory diseases, and liver disease to name a few—conditions that affect millions of Americans. NCCAM is also developing a diverse research portfolio to explore the use of CAM in treating menopausal symptoms.
DENTAL AND ORAL DISEASE

- Oral health problems can significantly affect overall health. Common oral diseases like dental caries (tooth decay) and periodontal (gum) disease are oral infections that, when left untreated, can impact systemic health and result in adverse health events. Periodontal disease, for instance, may seriously compromise the heath of individuals with vulnerable immune systems. Research has also shown that approximately 1 in 10 cases of death from pneumonia in elderly nursing home residents may be prevented by improving oral hygiene.

- Missing teeth, improperly fitting dentures, and oral infections can cause difficulty eating, sleeping, and working. They can impact quality of life and compromise compliance with therapy for other conditions.

- While an increasing number of Americans are keeping their natural teeth late into life, about 23% of 65-74 year olds have severe periodontal disease. One-fourth of those aged 65 and older have lost all of their teeth—loss is primarily from tooth-decay, which affects 90% and is the most prevalent chronic disease of seniors, although largely preventable.

- In 2007, oral and pharyngeal cancers were diagnosed in an estimated 37,000 Americans and resulted in over 7,500 deaths. Methods used to treat oral cancer are disfiguring and costly and about half of those diagnosed die within 5 years. These cancers are primarily diagnosed in elderly Americans—incidence rises steadily with age, peaking in persons ages 65-74. Oral cancer death rates have not improved significantly over the past several decades.

- One side effect of many medications is xerostomia or dry mouth. The reduction in salivary flow causes increased prevalence of dental caries and periodontal disease as well as trouble with wearing dentures. Estimates of the number of adults in long-term care facilities with xerostomia have been as high as 40%. Among the general elderly population, xerostomia is estimated to affect nearly 20% of people. It is estimated that twice as many institutionalized elderly in long-term care facilities are affected.

- In 2007, an estimated $98.6 billion was spent on dental services, the result of about 500 million visits to dental offices in the US.

- Research supported by the National Institute of Dental and Craniofacial Research (NIDCR) demonstrates associations between oral and systemic disease. Periodontal disease and other oral infections may be linked with diabetes, heart disease, stroke and respiratory infections—all disproportionately prevalent in the elderly. Additional research funds are required for investigational studies that include people over age 65, who have been largely underrepresented in past research. NIDCR should consider elders as a vulnerable population subject to inequality in oral health and quality of life.
23.6 million Americans, or about 8% of the population, have diabetes. Approximately 24% of diabetes cases, about 5.7 million Americans, are undiagnosed, down from 30% in 2005 and 50% ten years ago. An additional 57 million people are estimated to have pre-diabetes, a condition where blood glucose levels are abnormally high—but not yet high enough to be considered diabetes. Over 50% of those with diabetes are age 60 and older, about 12.2 million seniors.

Diabetes is the fifth deadliest disease in the U.S. and the leading cause of kidney failure, adult-onset blindness, and non-traumatic lower limb amputations. It is also a significant cause of heart disease and stroke—adults with diabetes have heart disease death rates 2 to 4 times higher and risk of stroke that is 2 to 4 times greater than non-diabetic adults. Overall, heart disease and stroke account for about 65% of deaths in people with diabetes.

In 2007, the cost of diabetes in the United States was estimated at $174 billion—$116 billion in direct costs and $58 billion in indirect costs resulting from lost workdays, disability, and premature mortality. This is a 32% increase from 2002, an increase of over $8 billion a year. The per capita annual cost of health care for a person with diabetes is about $11,700.

The burden of diabetes is expected to rise since conservative estimates predict that diabetes prevalence will increase 165% between 2000 and 2050. By 2030, 29 million Americans could have the disease. The alarming rise in obesity in the U.S. will also significantly impact diabetes prevalence. A study conducted by the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) also clearly demonstrated that lifestyle interventions reduced the risk of developing type 2 diabetes by 58%.

Some research has aided new drug development by validating the hemoglobin A1c marker, led to improved forms of insulin and continuous glucose monitors, identified susceptibility genes, and made significant progress towards understanding the molecular underpinnings of diabetes.

Other research studies are pursuing major discoveries in diabetes prevention, like molecular links between obesity and insulin resistance, genetic predisposition, the effect of maternal diabetes on offspring, and personalized treatments. Findings from two studies will continue to play a major role in the future care of diabetes—ACCORD, funded by the National Heart Lung and Blood Institute (NHLBI), and VADT, a clinical trial funded by the Department of Veteran’s Affairs—are providing important evidence to help guide treatment recommendations for patients with type 2 diabetes who have had or are at high risk for a cardiovascular disease, heart attack, and stroke.
14 million Americans age 65 and older report some level of disability, about 41% of this age group. Individuals with disabilities have 3 to 4 times the number of secondary health problems, compared to healthy individuals of the same age. Diabetes is 5 to 6 times higher in many disability groups; cardiovascular disease is the second leading cause of death for persons with spinal cord injuries; fractures are 5 times more common in persons with cerebral palsy; and osteoporosis affects close to 70% of individuals whose mobility is affected by a disability.

1.8 million seniors have fall-related injuries that require emergency room visits. Among older adults, falls are the number one cause of fractures, hospital admissions for trauma, lost independence, and injury-related deaths—nearly 15,800 older adults die from falls.

Disability can not only impact quality of life, but can also result in psychological problems. Rates of depressive disorders are 2 to 3 times higher among people aging with a disability than with non-disabled individuals of the same age. Depression can also have a powerful negative impact on one’s ability to function and is one of the leading causes of disability in the U.S.

Nearly 5 million Americans 65 and over have disabilities so severe that they require personal assistance to carry out everyday activities. Older individuals with disabilities are also more likely to develop secondary conditions such as chronic pain, excessive fatigue, changes in skills or conditions, fractures from falls, and pressure sores from continuous wheelchair use.

Advances in medical research, technology, and delivery have dramatically lengthened the average life span of persons with disabilities. However, we need additional knowledge about the aging process and its interactions with age-related diseases and disabilities.

Conditions such as chronic pain are too often accepted as a normal consequence of aging and as a result, too few preventive measures are practiced and problems are allowed to compound. We need to ensure that patient, caregiver, and doctor education regarding pain management will be expanded in order to have a significant impact on how pain is diagnosed and treated, and rehabilitation explored.

Scientists supported by the National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS) have demonstrated that disease-modifying antirheumatic drugs and newer treatment strategies have greatly eased long-term disability among older patients with rheumatoid arthritis. Non-medicinal therapies that improve quality of life and level of function have also greatly impacted patients.
As we age, our bodies become more susceptible to environmental hazards, some of which are found in our everyday environments and that can worsen chronic and life threatening conditions such as heart disease, stroke, diabetes, and chronic obstructive pulmonary disease (COPD). Common environmental hazards for older Americans include contaminants (e.g. particulate matter, ozone, mold, carbon monoxide, and second-hand smoke), lead, mercury, pesticides, extreme temperatures, and drinking water contaminants (e.g. E. coli and microorganisms).

Exposure to environmental hazards can have serious outcomes, including death—particularly for those who already suffer from a condition or chronic disease. COPD patients are among the most sensitive to air pollution and every year, thousands of Americans with COPD die from dangerous levels of particulate matter. In patients with diabetes, inhaling air pollution increases the chance of a heart event by decreasing control of blood flow. In patients with cardiovascular disease, contact with extreme temperatures and inhalation of indoor and outdoor pollutants increase the chance of a heart event. Older adults account for 75% of all hospitalizations due to gastroenteritis and other waterborne diseases and the highest death rates from intestinal disease are in individuals age 75 and older. While older adults account for a low percentage of incidents reported to Poison Control, they are twice as likely to experience a serious outcome, and ten times as likely to die from exposure.

Research has shown that long-term, occupational exposure to certain combinations of metal and oxidative stressor environmental agents, such as pesticides and heavy metals, is significantly associated with an increased risk of Parkinson’s disease in later life.

Through its Aging Initiative, the U.S. Environmental Protection Agency (EPA) is working to prioritize environmental hazards that affect older persons, examine the environmental impact of an aging population in a smart growth context, and encourage civic involvement of older personas in order to reduce hazards. Researchers in the Office of Research Development continue to study susceptibility of older adults to environmental exposures, how the body processes and rids itself of contaminants, and how the body responds to the stress of those contaminants. Educational materials that translate research findings for multiple audiences are available at www.epa.gov/aging.

Further investigation is still needed to uncover the gaps that exist within research on the effects of environmental hazards on the aging population, develop tools that can address the impact of an aging society on the environment, and design future models that will help reduce environmental hazards on local communities.
Epilepsy

- Epilepsy is one of the most common nervous system disorders and affects more than 3 million Americans. There are approximately 200,000 new cases of seizure disorders and epilepsy diagnosed every year and 10% of Americans will experience some type of seizure in their lifetime.

- Epilepsy and seizures can lead to the loss of driving privileges, independence, and self-confidence. Additionally, epilepsy can lead to increases in depression, social isolation, seizure-related injuries, and premature death.

- Epilepsy can develop at any age but is most likely to develop in those over age 65—the fastest growing population with epilepsy. The risk of developing epilepsy increases 30% for each decade after the age of 20. Over 300,000 of the 3 million Americans with epilepsy are 65 and older. The leading causes of new cases of epilepsy in the elderly are stroke, cerebrovascular disease, degenerative disorders such as Alzheimer’s disease, and brain tumors—22% of stroke patients and 10% of Alzheimer’s patients can be expected to develop epilepsy. Additionally, because of seizure-related falls and prolonged use of antiepileptic drugs, individuals with epilepsy are more likely to sustain bone fractures.

- Epilepsy in the U.S. costs an estimated $15.5 billion annually in medical costs and lost or reduced earnings and production. The lifetime cost of the approximately 200,000 new cases that develop every year is $11.1 billion.

- Scientists at the National Institute of Neurological Disorders and Stroke (NINDS) are working to find potential antiepileptic drugs and surgical therapy that will enhance treatment, exploring how genes may influence epilepsy, improving imaging technology, and experimenting with several new types of therapies. One emerging strategy is an implantable device that analyzes brain activity, detects developing seizures, and stops them from occurring with, in one case, a precise electrical stimulation or, in another, targeted drug delivery.

- A 2007 scientific conference held by the NINDS about progress in reaching previously established Epilepsy Benchmarks brought together leading scientists, health care providers, and patient representatives to articulate specific benchmarks in approaching their goal of finding a cure for epilepsy; for those gathered, the cure was defined as prevention of the disease in people at risk, and safe and effective treatment for those with the condition. Specifically in the area of treatment, these benchmarks focused on identifying the mechanism underlying seizure generation and on optimizing existing interventions and developing new therapies and technologies including drug delivery, surgical therapy, and implant treatments.
Older Americans have much more complex and frequent health care needs than younger adults. The incidence of many illnesses such as cancer, heart disease, and Alzheimer’s disease rise dramatically with age, leaving the average 75 year old suffering from 3 chronic conditions. Despite older Americans’ huge demand for health services and resources, the professional healthcare workforce is woefully unequipped to deal with older patients, and an acute shortage of professionals with geriatric training persists.

The U.S. currently needs an estimated 20,000 geriatricians to adequately care for its population of 35 million older people. By 2030, it is projected to need about 36,000 geriatricians to care for its older population. However, as of 2008, there were only 7,590 board certified geriatricians—one geriatrician for every 2447 people 75 and older. This number is projected to decrease to as few as 1 per 3,592 persons over 75 by 2030, when the older population is projected to reach 71.5 million, unless effective steps are taken to train new geriatricians.

There is also a lack of geriatric training of pharmacists, nurses, physicians’ assistants and other members of the health care field. Of the nation’s more than 200,000 pharmacists, only 720 have geriatric certifications as of 2005.

Registered nurses are also crucial to health care for seniors, but of today’s 2.4 million registered nurses, less than 1% are certified in gerontology, and only 3% of advanced practice nurses have specialized training in geriatrics.

The shortage is further complicated by the lack of academic geriatricians to train the needed providers in geriatric specialties, integrate geriatrics into medical practice, and develop standards of care for older people. Currently there are less than 900 full-time academic geriatricians in the U.S. and an estimated 2,400 are necessary.

Salary considerations play an important role in the decreasing number of geriatricians; geriatric medicine has the lowest median salary among U.S. specialties, and also the lowest percentage of medical school graduates enrolling in training programs. General internal medicine physicians make a higher median salary than geriatric internal medicine physicians (geriatricians), which requires additional years of training.

The ongoing NIH-supported Geriatric Academic Program assists in career development for junior faculty in geriatrics, but with changing health care needs in the U.S. greater investment in geriatric training and education is necessary.
Hearing loss is one of the most common disabling conditions for an older person. Approximately 32.5 million American adults, about 15%, have some form of hearing loss—that number is expected to nearly double by 2030.

The incidence of hearing loss increases with age. By age 65, nearly 1 in 3 Americans suffers from hearing loss and by age 75, close to half of all Americans have some form of hearing impairment.

Hearing loss can make communication difficult and promote social isolation. Adults with untreated hearing loss are more likely to report depression and anxiety, and are less likely to participate in social activities. Other impairments in the elderly such as vision loss, decreased dexterity, and limited mobility tend to make hearing loss increasingly difficult.

As they age, some individuals experience gradual hearing loss from presbycusis—a condition that affects the highest frequencies first, making discrimination of speech and conversations particularly difficult. Although the loss is gradual, it does not mean that hearing loss is a natural part of the aging process.

An estimated 50 million Americans experience tinnitus, the perception of sound in the ears or head when no external sounds are present. For 12 million people, the “ringing” or other sounds are severe enough that they seek medical attention. For about 2 million, the tinnitus is so severe that it interferes with their daily activities. Close to 12.3% of men and 14% of women over 65 are affected by tinnitus.

About 10% of American adults, or almost 22 million adults, have irreversible noise induced hearing loss and an additional 30 million are exposed to dangerous noise levels on a daily basis. Around one-third of all people with hearing loss can attribute it, at least in part, to noise.

The average lifetime cost for a person with hearing loss is estimated at $417,000 in 2003 dollars. The lifetime costs for all people with hearing loss who were born in 2000, are estimated to be $2.1 billion in 2003 dollars.

In recent National Institute on Deafness and Other Communications Disorders (NIDCD) studies, researchers were able to identify some of the genes important to ear development, and one that was found to regrow the inner-ear hairs, which cause hearing loss when damaged. Researchers also discovered that intake of certain anti-oxidants after sustaining noise-induced hair loss helps to limit damage to hair cells and therefore significantly limit the effect of the noise trauma on hearing.
Urinary incontinence (UI) affects as many as 25 million Americans. An estimated 15 million adult women in the U.S. suffer from stress urinary incontinence (SUI), the most common form of incontinence in women; about 17% of women and 16% of men over the age of 18 have overactive bladder (OAB); an estimated 12.2 million adults have urge incontinence.

Fecal incontinence affects an estimated 6.5 million Americans. Because it is under-reported and under-diagnosed, the numbers may considerably larger. It is suggested that 2.2% of all women who have delivered more than one child experience fecal incontinence; 7% of healthy people 65 and older, 23% of stroke patients, and 33% of elderly people at home or in a hospital experience fecal incontinence.

While UI does become more common with age—at least 1 in 10 people age 65 and older suffer from it—aging does not cause incontinence. The disease can be treated, controlled, and often cured.

Incontinence is a leading cause of institutionalization and more than half of all nursing home residents are incontinent. The frequent or urgent need for a restroom increases the risk of falls in elderly women by as much as 26%, and the risk of bone fracture by as much as 34%. In 2000, UI was the cause of more than 47,800 hospital stays by adults age 18 and older, and approximately 1.36 million outpatient visits by adults age 20 and older.

The total cost for UI was $19.5 billion (in 2000 dollars)—$14.2 billion of that cost was to community residents and $5.3 billion was to institutional residents. The total cost in 2000 of OAB was $12.6 billion—$9.1 billion to community residents and $3.5 billion to institutional residents. Over their lifetime, women with SUI spend an average of $58,000 on treatment and management.

The Urinary Incontinence Treatment Network (UITN) is a network of collaborating urologists and urogynecologists conducting research on urinary incontinence. UITN is currently conducting three promising trials—the first is TOMUS, the trial of mid-urethral slings, which will compare the effectiveness of two similar FDA-approved, minimally invasive surgical procedures to treat SUI; the second is SISTeR, the stress incontinence surgical treatment efficacy trial, which compares long term efficacy levels between different, widely used procedures to treat SUI; and the third is BE-DRI, or behavior enhances drug reduction of incontinence, which will determine if adding behavioral treatments to drug therapy will allow for the eventual removal of the drug therapy and maintain positive results.
Infectious diseases are a major cause of morbidity and mortality in the elderly—a population with increased susceptibility to infection due to factors including the natural decline in the immune system called immune senescence that accompanies aging, the common presence of other chronic conditions, and the high occurrence of poor nutritional status. Some common infectious diseases in the elderly include pneumonia, influenza, urinary tract infections, shingles, bacteremia, and tuberculosis.

Influenza and pneumonia together are the seventh leading cause of death in the U.S. and the sixth leading cause of death in those 65 years and older—Americans 65 and older account for more than 50% of all pneumonia cases. About 900,000 influenza related deaths have occurred in the U.S. in the last 30 years, making it one of the leading causes of death among vaccine-preventable illnesses. Taken together, around 70,000 Americans die from influenza, pneumonia, and hepatitis B-related illnesses each year, all of which have vaccines available.

Without large-scale immunization, a flu pandemic in the U.S. is projected to cost as much as $167 billion dollars in direct medical costs, lost productivity and death. Influenza alone causes about 36,000 deaths and 200,000 hospitalizations in the U.S. each year, almost all of which are in the senior population, despite the fact that influenza is fairly easily recognized, and influenza vaccines are 60-80% effective in seniors. Research shows that vaccinating healthy employed adults can save as much as $31 per person immunized.

Herpes zoster, known as shingles, is a disease most common in older individuals that can cause hearing and vision loss, scarring, skin infections, intense pain, internal organ complications, and even death. Between 2003 and 2005, shingles affected an annual average of 1.1 million people, only around 80% of whom sought treatment. The shingles vaccine is recommended for adults 60 years and older. It is estimated that the vaccine cuts the risk of shingles in half and the risk of the neuralgia aftermath by two thirds, preventing 250,000 cases a year and reducing the severity of another 250,000.

Researchers at the National Institute of Allergy and Infectious Diseases (NIAID) and the National Institute of Neurological Disorders and Stroke (NINDS) are seeking different approaches to shingles treatment and prevention—one research group is looking for ways to boost the white blood cells that prevent the shingles virus; another is looking for how the virus enters and exits neurons with the hope of blocking it from entering; and yet another is looking for neurological differences between those who experience postherpetic neuralgia with the hope of pinpointing its causes and develop effective treatments.
Seniors have more chronic diseases and conditions and as a result, use more medications. The average 65-69 year old takes nearly 14 prescriptions a year, and the average 80-84 year-old takes an average of 18 prescriptions a year. Seniors consume 40% of prescription and 35% of over-the-counter drugs. This makes seniors especially vulnerable to medication errors and medication-related problems, which can lead to impaired functional capacity, cause confusion, reduce independence and lead to increased emergency room visits, hospitalizations and ultimately result in long-term disabilities.

Adverse drug reactions are among the top five greatest threats to the health of seniors. Medication-related problems are responsible for 28% of hospitalizations of the elderly, and are the cause of 32,000 hip fractures each year. Adults age 65 or older are two and one-half times more likely to visit an emergency room due to an adverse drug event than younger individuals.

If classified as a distinct disease, adverse drug reactions would rank between the fourth and sixth leading causes of death in the U.S. According to one report, over 2 million hospitalized patients experienced a serious adverse drug reaction and 100,000 experienced a fatal reaction in just one year. Serious adverse drug reactions occur in an estimated 6.7% of hospitalized patients and 36% of reported adverse drug reactions involve an elderly person. The economic costs are staggering, with direct medical costs totaling as much as $177 billion annually in the ambulatory population.

A July 2006 report estimates there are about 1.5 million preventable injuries a day that are caused by medication errors, and seniors are at the highest risk for such mistakes. The extra cost of treating drug-related injuries in hospitals alone is estimated at $3.5 billion a year in direct medical costs, the same report says.

Elderly patients taking multiple medications are more prone to drug abuse. As many as 17% of adults age 60 and older abuse prescription drugs.

Current research is looking at the prevention of adverse drug reactions in the elderly by identifying patient and health care provider factors associated with the reactions, as well as the underlying clinical causes of adverse reactions and system failures.
Men have shorter life spans than women by more than 5 years. As a result, approximately 15% of women who marry men near their own age enter retirement as widows.

Men face higher mortality rates for most of the top 10 leading causes of death. For example, in terms of deaths per 100,000 people, men were almost twice as likely to die from heart disease as women in 2005.

Men are at higher risk of death and disease than women due to multiple factors including making half as many preventive visits to the doctor, being more likely to not have health care coverage, having less healthy lifestyles, and having more dangerous occupations. Research into male-specific diseases is also under-funded.

An estimated 6 million men in the U.S. suffer from a depressive disorder every year. The symptoms and coping mechanisms in men are often very different than in women, and men in general are about 4.4 times more likely to commit suicide. Among seniors, this difference is even more pronounced, as senior men are over 7.3 times more likely to commit suicide than their female counterparts. Over 70% of older suicide victims visit their primary care physician within a month of their death.

Almost twice as many men as women die of ischemic heart disease. After age 45, a man’s risk of heart disease begins to rise significantly. Men usually develop heart disease 10 to 15 years earlier than women do.

50% more men than women die of cancer. Men have close to a 1 in 2 lifetime chance of dying from cancer. The prostate, lung, bronchus, colon, and rectum are the most common cancer sites in men.

Aging can lead to low testosterone in men causing fatigue, increased body fat and depression in the short term, and potentially osteoporosis, depression, and diabetes in the long-term. Low testosterone is often treatable.
1 in 4 American adults have a diagnosable mental illness during any one year and about 6% of seniors have a diagnosable depressive illness. Unfortunately less than 25% of older adults with a diagnosable mental illness get appropriate treatment.

Depression is one of the most common mental health conditions, affecting around 19 million Americans each year. More than 2 million Americans age 65 and older suffer from some form of depression. 6 to 9% of seniors in primary care setting suffer from major depression and more than 30% of seniors suffering from major depression report suicidal thoughts. Depression in Americans 65 and older increases the risk for stroke and other medical conditions.

The suicide rate for those over 65 is higher than the national average—seniors make up about 12% of the population, but account for 16% of all suicides. The rate of suicide in men 65 and over is more than seven times higher than that in women 65 and over. About 75% of seniors who commit suicide have visited a primary care physician within one month of their suicide. In general, primary care physicians fail to diagnose depression 50% of the time.

The economic cost of depressive illness is estimated at 30 to 44 billion dollars annually. Older patients with high levels of symptoms of depression have health care costs that are close to 50% higher than for non-depressed seniors.

Around 4 million older Americans suffer from dementing disorders; about 5 million suffer from serious and persistent symptoms of depression, and another million suffer from major depressive disorders.

Future research at the National Institute on Mental Health (NIMH) may consider broad models of aging and disease and their possible interaction with the expression of psychiatric disturbances later in life, such as studies of vascular disease as a process that may lead to depression and other illnesses in late life. Similarly, work done with the elderly may offer insights into mechanisms of disease progression and/or maintenance that would be useful for the younger adult population. These types of studies have the potential to lead to the discovery of new targets for intervention research. In turn, new targets may lead to the development of new medications that target symptom expression or relapse. Such new medications would be useful across lifespan.
PARKINSON’S DISEASE

About 1 million Americans are living with Parkinson’s disease—a degenerative neurological disorder that results from the progressive loss of 50% of dopamine-producing cells and causes disabling tremors, stiffness, slowness of movement, balance impairment, and cognitive impairment (including dementia in some)—ultimately leaving sufferers incapable of caring for themselves.

4% of Parkinson’s cases are diagnosed in people under age 50. The average age of onset is 60 years old.

No cure exists for the disease and every year around 60,000 new cases are diagnosed. After Alzheimer’s disease, Parkinson’s disease is the most common neurodegenerative disease.

In addition to the enormous pain and suffering of those afflicted, Parkinson’s disease places a tremendous strain on families and loved ones and costs our society more than $32 billion annually in disability costs and lost productivity.

Some Parkinson’s disease symptoms can be treated. Deep brain stimulation (DBS) is one treatment that can provide significant symptomatic relief as well as significant cost savings, decreasing medication costs by as much as 39% after 2 years in one study. Some studies suggest that cognitive decline may be more significant in Parkinson’s disease patients who have undergone DBS, but a recent randomized clinical study conducted by the Veteran’s Administration and the National Institute of Neurological Disorders and Stroke (NINDS) demonstrated that DBS was superior to the best medical therapy in most patients with moderately advance Parkinson’s disease. DBS is an effective symptomatic treatment but there is no convincing evidence that it slows Parkinson’s disease progression and DBS does not address non-motor features of the disease such as dementia, sleep disturbance, gait imbalance, and speech difficulties. Therefore, it remains critical to advance research geared toward understanding the degenerative process and devise new strategies to stop or reverse Parkinson’s disease progression.

Current research supported by the NINDS is enabling both basic and clinical research that investigates the progression of the disease and develops new drugs therapies; looks for the cause of the disease and continues to search for environmental and genetic factors; and works to develop new protective drugs that can delay, reverse, or even prevent the disease.

A large set of clinical trials are assessing interventions, including dietary supplements creatine and coenzyme Q10, that may slow the progression of Parkinson’s disease. Other research also underway is investigating restorative treatments, those which promote renewed dopamine formation in the brain.
Healthy lifestyles play a key role in prevention. The three leading causes of death in the U.S.—heart disease, cancer, and stroke—are associated with unhealthy lifestyle choices such as smoking, poor nutrition, and lack of exercise. For heart disease, obese individuals are more than twice as likely to develop heart disease and more than twice as likely to have high blood pressure, as normal weight individuals. For cancer, evidence suggests that around one-third of cancer deaths will be related to poor nutrition, physical inactivity, overweight or obesity, and other lifestyle factors. For stroke, one study found that for each unit increase above normal in body mass index, a man’s chances of having a stroke increased by 6%. Daily physical activity helps to lower blood pressure and cholesterol, prevent or retard osteoporosis, and reduce obesity, symptoms of anxiety and depression, and symptoms of arthritis.

Obesity in the U.S. has reached epidemic proportions—65% of American adults are overweight or obese. Several studies estimate that being overweight or obese directly caused between 250,000 and 400,000 deaths per year in the U.S. It has a huge economic impact—costing the nation as much as $129 billion annually, and the individual 36% more in health care expenses than normal weight individuals.

The development and use of vaccines also plays a huge role in prevention. Vaccinations save around $14 in health care costs for every $1 spent. Biotechnology advances are allowing researchers to create “recombinant” vaccines, cause organisms to mass produce antigens which can induce immune responses, and sequence the genomes of disease-causing microbes. This research is leading to vaccines with great potential to eradicate diseases.

Screening is also an important tool in prevention. Cervical cancer, once the most common cause of cancer death in American women, has decreased 75% since the implementation of the pap smear screening program. Studies have found that screening with mammograms reduces the number of breast cancer deaths in women ages 40 to 69. Screening for high blood pressure, high cholesterol, and other risk factors for cardiovascular disease play an important role in reducing mortality.

Sustained federal funding for the NIH is needed to develop cost effective and sustainable interventions for the prevention of diseases. Low levels of implementation of simple, cost effective preventative screening measures would save thousands of lives per year—an estimated 14,000 additional lives would be saved per year if 90% of adults ages 50 and older were up to date with colorectal cancer screenings; about 12,000 lives per year would be saved if the annual proportion of adults 50 and over who receive recommended influenza vaccines was brought from 37% up to 90%; and about 3,700 lives would be saved if 90% of women 50 and over were up to date with their 2 year breast cancer screenings, up from today’s 67%.
Every year an estimated 775,000 Americans suffer a stroke—approximately 610,000 of these were first attacks, and about 185,000 recurrent attacks. When considered separately from diseases of the heart, stroke is the number three killer in the U.S., killing more than 137,000 people annually, or 1 in every 17 deaths in the U.S. The number of stroke deaths is predicted to reach near 275,000 by 2032.

Stroke is a leading cause of disability in U.S. adults. 20% of stroke survivors require institutional care 3 months after onset and 15-30% are permanently disabled.

The direct and indirect costs of stroke in 2009 are estimated to be $69 billion. Stroke treatment costs are projected to exceed $2.2 trillion between 2005 and 2050.

While stroke prevention and treatment has been successful in the last decade—age adjusted stroke death rates are down 30% since 1999—the risk of stroke increases substantially with age, and much of the aging Baby Boom generation will be at risk.

Research supported by the National Institute of Neurological Disease and Stroke (NINDS), part of the NIH, have made significant breakthroughs in the areas of stroke prevention, screening and treatment. Study results help inform health care providers as to what the most effective stroke prevention and treatment strategies are based on a patient’s characteristics, level of risk, response to medications, and the probability of surgical success. For example, NINDS-funded researchers have developed a clinical assessment tool to identify patients with minor transient ischemic attacks who are at greatest risk of stroke following and could benefit from acute preventive treatment. Other NINDS-funded researchers found that specific combinations of preventative therapies, such as aspirin, plus angiotensin-converting enzyme or ACE, plus statins, reduce the severity of strokes when they did occur. Also, the NINDS study called REGARDS found that the “silent strokes” uncovered by imaging technologies are more common than previously known, and also warn of a more severe stroke.

The success of the clot-busting drug t-PA, the only FDA-approved emergency treatment for ischemic stroke, has spurred the growth of specialized stroke patient care and education. There are now more than 250 certified stroke primary centers nationwide. Researchers are currently investigating ways to increase the effectiveness of t-PA through ultrasound guidance and direct injection to the site of the brain artery clot. NINDS's seven SPOTRIAS (Specialized Programs of Translational Research in Acute Stroke) centers are developing new stroke treatments and broadening the scope of its accessibility to patients.
As of 2008, an estimated 9.31 million Americans 65 and older were military veterans, 39% of all veterans. The median age of all military veterans as of September 2007 was 60 years old. In response, the Department of Veterans Affairs (VA) has established a variety of programs to meet the health care needs of older patients and has taken a leadership role in geriatrics through its Geriatric Research, Education and Clinical Centers (GRECCs).

The VA operated Veterans Health Administration is the largest direct health care delivery system in the country, with over 850 locations that serve over 7.5 million veterans. The VA has outscored the private sector in patient surveys of quality care for the past six years. The VA is also seeing success in patient outcomes—one study showed that veterans age 65 and older receiving VA care had about a 40% lower risk of death than those with Medicare Advantage care provided through private health plans or HMOs.

Veteran-centered research projects have led to numerous advances that promise to increase the understanding of disease and uncover strategies for treatment and cures. For example, the VA Research Program has developed many procedures and devices that are in routine medical practice, including the cardiac pacemaker and the nuclear-powered pacemaker, radio-immune assay techniques, the smart wheelchair, the first robotic limbs and the laser cane for the blind.

Currently one of the VA’s four strategic goals is to restore the capabilities of disabled veterans as much as possible, and so the VA has become an international leader in prosthetics and rehabilitation. It currently has 58 orthotic-prosthetic labs with 185 employees.

VA researchers are currently investigating a multitude of diseases and possible therapies—one researcher recently found success using heart-produced hormones in treating cancer in animal models; and another designed a computer system that provides ventilation-function monitoring and helps patients with COPD avoid dynamic hyperinflation in the lungs.
Currently more than 38 million Americans age 40 and older have significant vision impairment and eye disease—3.3 million of them are blind or experience low vision. About 35 million Americans age 40 and older have an age-related eye disease such as age-related macular degeneration (AMD), cataract, glaucoma, and diabetic retinopathy. That number is expected to grow to 50 million by 2020.

Vision impairment and eye disease are not only a significant cause of disability and lost independence, but they also have a huge economic impact, costing the U.S. $68 billion annually in direct health care costs, lost productivity, and diminished quality of life.

Almost every major breakthrough in eye disease has resulted from support from the National Eye Institute (NEI), which is celebrating its 40th anniversary in 2009. These advances include: discovery of the first generation of FDA-approved drugs, anti-angiogenic factors, that have been shown to slow the progression of AMD and restore 3 lines of vision on an eye chart; demonstration through AREDS (Age-Related Eye Disease Study) that high levels of dietary antioxidants and zinc reduce risk of AMD by 25%; identification of proteins that help prevent lens clouding in cataract patients; discovery of gene variants associated with the incidence of AMD; and the significant reduction of diabetic retinopathy through better prevention.

NIH-funded research has also produced significant cost savings. For example, treatments that have been found to delay or prevent diabetic retinopathy save the U.S. $1.6 billion annually; and research that led to cataract surgery saved Americans an estimated $300 billion in benefits in 2003 alone.

NEI researchers are poised to make even greater discoveries and breakthroughs in diagnosis and treatment of the leading causes of vision loss. Recently, researchers began a multicenter study comparing the effectiveness of two FDA-approved medications for advanced AMD. One study recently found that the donor pool for cornea transplants should expand to include donors up to 75 years old. The NEI recently established eyeGENE, a program that will focus on genetic testing for eye diseases. The second phase AREDS trial, AREDS2, is still currently underway, expanding on the findings of the first in 2005 by evaluating the effect of other supplements such as lutein and beta-carotene in treating AMD and cataracts. A new program, dbGaP, is disseminating the genetic data and clinical results from the first AREDS trial. And a recent study in animal models of glaucoma identified the mechanism behind cell death in the specific cells that support the optic nerve, which leads to blindness.
The area of women’s health includes all diseases and conditions that affect women solely, predominately, differently, or disproportionately. Sex and gender differences in health can affect prevention, diagnosis, and treatments for many diseases and conditions.

Women live longer than men. In 2005, life expectancy at birth remained at its all-time high of 77.8 years—80.4 for women and 75.2 for men. However, women also suffer disproportionately from many chronic diseases and conditions such as cardiovascular disease, breast cancer, mental health disorders such as depression, osteoporosis, autoimmune diseases, stroke, and incontinence.

Cardiovascular disease (CVD) is the number one cause of death in American women across all cultures and has killed more women than men since 1984. 1 in 3 female adults in the U.S. have some form of cardiovascular disease. Women are more likely than men to have a second heart attack within a year of the first and are twice as likely to be disabled by heart failure within 6 years. Many of the physiological differences that cause these disparities are still unknown. The estimated direct and indirect costs of CVD for 2008 were $475.3 billion.

80% of those who suffer from osteoporosis and 75% of those who suffer from autoimmune diseases such as hypothyroidism, hyperthyroidism, rheumatoid arthritis, and lupus are women. Women also suffer from depression about twice as much as men. As with cardiovascular disease, many of the physiological differences that cause these disparities are still unknown.

The physiological and psychological consequences of caregiving must also be examined and recognized as a women’s health issue. Approximately 60% of family caregivers are women. Many have come to be part of the “sandwich generation,” caring for their children and their aging parents simultaneously. This unique population is increasing in size and significance as average life expectancy increases. Caregiver stress can also take 10 years off a family caregiver’s life and can impact a caregiver’s immune system for up to 3 years after their caregiving ends. Elderly spousal caregivers who have chronic illnesses and are experiencing stress have a 63% higher mortality rate than their non-caregiving peers.

75% of women suffer from menopausal symptoms. There is no consensus on the safest ways to treat these highly prevalent conditions.

The Office of Research on Women’s Health (ORWH) at the NIH set a number of basic, clinical, and translational research priorities for 2008 including: research to identify and validate biomarkers to pinpoint changes that are indicators of disease risk, pathogenesis and progression; and research investigating the role of sexual dimorphism in the role of gene function and cell signaling pathways.

A number of clinical trials conducted by the NIH’s separate institutes and coordinated by the ORWH were initiated and are still underway—examples include research concerning the onset of age-related macular degeneration (AMD) in older women and the effects of estrogen levels on women’s health in perimenopause and menopause.
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Urging Congress and the President to Restore a National Commitment to Medical Research