

ask the experts

Staying Sharp

Late-Life Brain Disorders:
Getting the Facts



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Late-Life Brain Disorders: Getting the Facts

Is there anyone who doesn't desire to live life to the fullest every day? To maintain our day-to-day activities and enjoy the things that bring us pleasure, no matter our age? To remain free from crippling health problems and from being overly dependent on others? Living well in old age is more important than just living to old age.

The good news is that many of us are doing the former. According to the National Institute on Aging, older people today are not just living longer; they are generally better off—healthier and wealthier—than ever before. About three-quarters of Americans 65 years of age and up report their health as good or excellent. And the rate of disability among older persons is declining at a faster pace than ever before, in a country that already enjoys one of the lowest disability rates in the world.

Taking care of your brain's health throughout life's various stages has immeasurable benefits, from staying cognitively sharp and enjoying a high quality of life in your "second half" to possibly helping prevent disease and loss of independence. But sometimes, no matter what we do, we still get sick.

Brain disorders and diseases are among the most feared medical problems. But becoming well informed about serious neurological conditions that may develop can help allay those fears—and can help you respond if you or someone you love develops one.

In this booklet, we take an in-depth look at a few of the most common and most debilitating late-life brain disorders: dementia, depression, stroke, Parkinson's disease, and chronic pain.

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Tenets of Successful Brain Aging

We all know people who stay sharp as a tack well into old age, or who seem to blossom creatively in the second half of their lives. A large and growing collection of scientific research focuses on determining what is different about people who tend to age successfully—that is, with minimal declines in cognition and memory. It turns out that they seem to share certain characteristics, described below, which may contribute to keeping them mentally sharp.

Physical activity is strongly linked with lifelong brain health. In particular, moderate aerobic exercise (such as walking, biking, or swimming) seems to sharpen memory skills. A recent study found that strength training also improves cognition in older women.

Mental exercise, especially learning new things or pursuing activities that are intellectually stimulating, may strengthen brain-cell networks and help preserve mental functions.

Longer formal education is associated with mental sharpness among older people, possibly because continued learning creates a neural reserve of denser, stronger nerve-cell connections that increase the brain's ability to compensate for age-related changes in neural structure and function. Better-educated people also may tend to lead brain-healthier lifestyles in general.

Self-efficacy, the sense that we exert some control or influence over our lives and the lives of others—that what we do makes a difference—seems to prevent cognitive decline. The reasons are not entirely clear, but some experts believe that self-efficacy may be related to a greater resilience to stress.

Social interaction—staying socially active and regularly engaging with family and friends—is an important predictor of healthy brain aging; and the flip side, social isolation, is associated with greater cognitive decline and other health problems. How social interaction benefits the brain is not well understood; one theory is that a strong social network may facilitate new learning and help people better manage stress. People who are socially engaged are also likely to be more active, both mentally and physically, which may help explain the apparent brain benefits.

Dementia and Alzheimer's Disease

Dementia is an umbrella term for a group of medical conditions that disrupt the way the brain works. Generally used to describe people with impaired

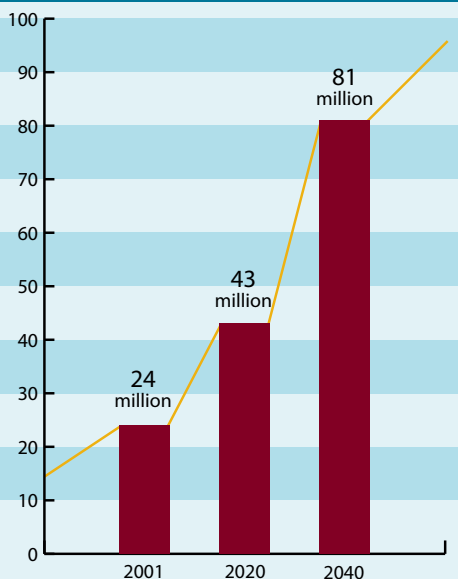
cognitive functioning, it can affect young and old alike. Though dementia occurs more frequently in older people, it is not a normal part of the aging process. There are many types of dementia, and many causes.

Alzheimer's disease (AD) is thought to be the most common form of dementia.

Because its frequency increases with age, the number of people it strikes is growing as the population ages.

In addition to memory loss, the first signs of Alzheimer's often include language difficulties and trouble with routine activities such as

FIGURE 1: Estimated numbers of people with dementia worldwide, by year.



SOURCE: Ferri CP, Prince M, et al; Global prevalence of dementia: a Delphi consensus study. *Lancet*, 2005; 366-2112-2117.

driving and shopping. Mood changes may also occur. As the disease progresses, long-term memory may also be affected, and

behavioral changes such as aggression, agitation, delusions, and verbal outbursts may occur. In later stages, the ability to carry out daily tasks such as dressing or bathing is compromised, and eventually, basic functions such as communication and mobility are lost.

It's important to remember that not all dementia is caused by Alzheimer's disease. Recent studies have highlighted vascular dementia, a type caused by restricted blood flow to the brain, as a growing problem. Some experts believe that vascular dementia may account for as much as a third of all dementia, and "mixed dementia"—Alzheimer's plus vascular disease—may make up another third or so. Alzheimer's and vascular dementia share some risk factors, including high blood pressure, diabetes, obesity, and high cholesterol. Controlling these risk factors through lifestyle modifications and appropriate treatment could significantly reduce the incidence of dementia, experts say.

Ten Warning Signs of Alzheimer's Disease

Memory loss that disrupts normal life: One of the most common signs of Alzheimer's is memory loss, especially forgetting recently learned information. Others include forgetting important dates or events, asking for the same information repeatedly, and relying on family members for things once handled independently.

Challenges in planning or solving problems: Some people may experience changes in their ability to develop and follow a plan to work with numbers. Following a familiar recipe or keeping track of monthly bills may become difficult. They may have trouble concentrating and may take much longer to do things.

Difficulty completing familiar tasks at home, work, or leisure: People with Alzheimer's often find it hard to complete daily tasks such as driving to a familiar location, managing a budget at work, or remembering the rules of a favorite game.

Confusion with time or

place: People with Alzheimer's can lose track of dates, seasons, and the passage of time. They may have trouble understanding something if it is not happening immediately. Sometimes they may forget where they are or how they got there.

Trouble understanding visual images and spatial relationships:

For some people, vision problems are a sign of Alzheimer's. They may have difficulty reading, judging distance, and determining color or contrast. In terms of perception, they may pass a mirror and think someone else is in the room—they may not realize it is their reflection.

New problems with words in speaking or writing:

People with Alzheimer's may have trouble following or joining a conversation. They may stop in the middle of a conversation and have no idea how to continue, or they may repeat themselves. They may struggle with vocabulary, have problems finding the right word, or call things by the wrong name (such as calling a

watch a “hand clock”).

Misplacing things and losing the ability to retrace steps:

People with Alzheimer's disease may put things in unusual places. They may lose things and be unable to go back over their steps to find them again. Sometimes they accuse others of stealing. This may occur more frequently over time.

Decreased or poor

judgment: People with Alzheimer's may experience changes in judgment or decision-making. For example, they may use poor judgment when dealing with money and become vulnerable to scams. They may pay less attention to grooming or keeping themselves clean.

Withdrawal from work or

social activities: People with Alzheimer's may start to remove themselves from hobbies, social activities, work projects, or sports. They may have trouble keeping up with a favorite sports team or remembering how to practice a favorite hobby. They may also avoid being social because of the changes they

have experienced and their insecurities.

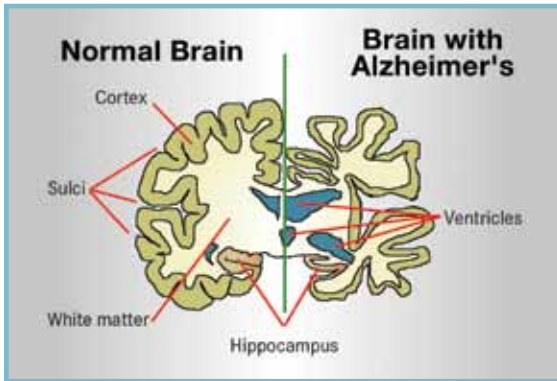
Changes in mood and

personality: The moods and personalities of people with Alzheimer's can change. They can become confused, suspicious, depressed, fearful, or anxious. They may be easily upset at home, at work, with friends, or in places where they are out of their comfort zone.

Source: Alzheimer's Association

What Causes Alzheimer's Disease?

Alzheimer's is a neurodegenerative disease, which means neurons (nerve cells) undergo progressive damage. Eventually they lose their ability to function normally and die. Cells in the hippocampus, a horseshoe-shaped structure deep in the brain that is important in the formation



of memories, appear to be especially vulnerable. In brain-imaging studies of people with Alzheimer's, the hippocampus is consistently smaller than normal.

The brain pathways that link the hippocampus to other brain regions are also

damaged, especially those that lead to the prefrontal cortex, the brain's control center for cognitive functions. Many scientists believe this damage may be responsible for the persistent short-term memory problems (as described on page 7) that appear in early stages of the disease.

The cause of nerve-cell death is the subject of intense scientific investigation, an effort that has provided important clues but few concrete answers. Many experts believe that cell death is related to an accumulation of a sticky protein called amyloid, which forms dense plaques around and between nerve cells. Another hallmark of the disease, seen in brain tissue upon autopsy, are neurofibrillary tangles—twisted bits of a second protein called tau—that build up inside nerve cells.

Whether these amyloid plaques and tau tangles are the cause of cell death or the result of it is not clear. Other proteins or enzymes are also involved in the processing of amyloid and tau, so the interaction of many proteins could be what ultimately leads to nerve-cell death.

Age is the primary risk factor for Alzheimer's, but many scientific questions remain about what triggers Alzheimer's disease in some people and not others. Inherited genes have a role in relatively rare early-onset forms of Alzheimer's,

but their influence on the more prevalent late-onset form is less clear. One gene, called ApoE, has been linked to late-onset Alzheimer's: People who inherit two copies of an ApoE gene variant—called the E4 allele—have a 95 percent risk for developing the disease by age 85. Another variant of the ApoE gene seems to be protective against Alzheimer's, so the genetic puzzle is complex.

It is clear, however, that genes are only one of the factors that contribute to an individual's risk for developing Alzheimer's. The disease probably has a combination of genetic and environmental triggers, which include lifestyle elements such as diet, physical activity, and mental exercise, as well as medical-history factors such as having suffered a head injury.

Diagnosing Alzheimer's Disease

Memory loss is one of the earliest signs of Alzheimer's disease, and a friend or relative is usually the first to notice it. If you or someone close to you is experiencing

any of the warning signs for the disease, it is important to see a doctor as early as possible to determine the cause. Memory loss could be the result of several things, some of which may be reversible.

Currently, the only definitive diagnosis for Alzheimer's disease is based on an examination of brain tissue during autopsy. But with a clear diagnostic strategy, doctors can determine with a high degree of accuracy whether Alzheimer's is either probable, meaning that no other dementia-causing disorder has been found, or possible, an indication that Alzheimer's is suspected but other causes cannot be ruled out. This strategy, both for Alzheimer's and for diagnoses of other kinds of dementia, includes thorough examinations and tests, often over a period of time, to be more certain that decline is continuing.

The evaluations that a doctor typically performs to obtain a diagnosis include the following:

Medical history and physical examination—a thorough review of current medical or psychological conditions, including personal and family health history and medications being used, as well as an evaluation of nutritional status, blood pressure, and pulse rate. This evaluation includes routine laboratory tests, including blood and urine tests to try to identify blood-based or hormonal irregularities.

Neurological examination—a clinical assessment to determine one's sense of time and place and ability to remember, to understand, to communicate, and to complete simple calculations. This typically includes a pen-and-paper test called the Mini Mental State Examination (MMSE).

If these initial examinations don't reveal a clear diagnosis, the doctor may order additional tests, which may include the following:

- **Brain-imaging scans**, such as magnetic resonance imaging (MRI) or computed tomography (CT), to look for telltale brain changes.

- **More extensive neuropsychological evaluations**, such as tests of memory, reasoning, vision-motor coordination, and language function.
- **A psychiatric evaluation** to assess mood and other emotional factors.

Treatment

As science progresses toward a better understanding of what kills brain cells in people with Alzheimer's disease, medicines or other therapies might be developed to delay, prevent, or reverse the damage. Dozens of therapies are under investigation. Most target early stages of the disease and aim to stop its progression. Clinical trials are underway for drugs and vaccines that interrupt the buildup of amyloid in the brain. If these treatments are found to be safe and effective, they would be the first that address what many experts think is the underlying cause of cell death.

Unfortunately, it will take years for such therapies to reach patients. In the meantime, the primary goals of therapy for

Alzheimer's are to improve quality of life and day-to-day functioning.

Current treatments for Alzheimer's include a group of medications that increase brain levels of acetylcholine, a neurotransmitter involved in learning and memory processes. These drugs include donepezil (Aricept), rivastigmine (Exelon), and galantamine (Razadyne). A newer drug (approved in 2003), memantine (Namenda), works by regulating levels of glutamate, another brain chemical involved in learning and memory.

Each of these drugs has been modestly successful in improving memory and attention skills for some patients, and each may also have a beneficial effect on behavioral symptoms such as aggression. They are most effective in people with early-stage Alzheimer's. None are curative, nor do any of them address the accumulation of amyloid in the brain.

Other types of treatments may also target behavioral symptoms associated with

Alzheimer's, such as agitation, delusions, hallucinations, depression, or sleep difficulties. Medications to control these problems might include antidepressants, antipsychotics, or sleep aids. Each of these requires great care and continued monitoring by a physician, as side effects in an already damaged brain can be serious.

What's New in Brain Research: The Quest for a Diagnostic Test

The lack of a definitive diagnostic test that would clearly identify who has Alzheimer's is one of the biggest challenges both for researchers seeking to develop new treatments and for clinicians who diagnose the disease. Finding biomarkers—biological signs of the disease in the blood or the fluid that surrounds the spinal cord—has been a major goal of Alzheimer's research.

The quest has entered a new phase with the launch of the Alzheimer's Disease Neuroimaging Initiative, a major research initiative funded by the National Institutes of

Health (NIH). The goal is to establish neuroimaging and biomarker measures that will enable researchers—and, ultimately, practicing physicians—to track changes in the living brain. Such changes could mark a transition from normal aging to mild cognitive impairment (MCI), a mental decline that is noticeable but not severe enough to interfere with daily life, or a transition from MCI to Alzheimer's disease.

In November 2009, NIH announced that an additional \$24 million would be invested in the initiative. The additional funding is aimed at increasing scientific knowledge of the sequence and timing of events leading to MCI and Alzheimer's, and developing rigorous methods that would enable early detection of these conditions and allow close monitoring of their progression. Already, the initiative has made significant steps in developing tests that measure levels of tau and amyloid in cerebrospinal fluid.

Living with Alzheimer's

When severe memory loss significantly interferes with daily life, simple tasks can be difficult or insurmountable. Below are some strategies that may help lessen the impact on day-to-day functioning.

- Establish and follow a regular routine in familiar surroundings.
- Label or color-code doors to help avoid getting lost.
- Draw a map for simple routes; write down directions.
- Make lists and use a calendar or pocket diary to jot down reminders and keep track of important dates and financial matters.
- Recognize limits and set realistic daily goals.
- Keep track of when to take medicines; use a reminder box or chart posted on the refrigerator to stay current with prescriptions.
- Get regular medical checkups, and tell the doctor about any medicine being taken or any changes in health status.

- Keep a list of names and numbers near the telephone.
- Stay in touch with family, friends, and acquaintances.
- Get treatment for any other chronic health conditions, such as high blood pressure, diabetes, high cholesterol, or heart disease.
- If agitation is a problem, find alternative ways to express anger, such as exercising, hitting a punching bag, or making a gripe list.

Caring for a Person with Alzheimer's

Long-term, progressive dementia ultimately makes independent living impossible. This means long-term care is necessary, either in the home, in an assisted-living environment, or in a nursing home. More than half of people with Alzheimer's live at home, but most require full-time care in the most advanced stages, which often means placement in a nursing home. NIH estimates that half of people who live in nursing homes have Alzheimer's. An increasing number of nursing facilities now specialize in the

care of people with dementing illnesses, offering skilled personnel and programmatic activities specifically designed to deal with the difficult behavioral challenges of dementia.

Many spouses and relatives of people with Alzheimer's choose to care for them at home. These caregivers are often called the second victims of Alzheimer's.

Because of their immense responsibilities, caregivers may find themselves isolated from friends and social

contacts, which can negatively affect their own overall health. Several studies have described the physical and mental health difficulties associated with caregiving, including fatigue, weakened immunity, and increased risk for depression. One recent poll found significant depressive symptoms in more than half of caregivers surveyed.



Not surprisingly, many caregivers report high levels of stress, which may weaken immune functions and make people more susceptible to flu or other viruses and slower to heal after injury.

Caring for the Caregiver

If you're caring for someone with Alzheimer's or any other serious, progressive disorder,

try not to ignore your own emotional and physical needs. The many options for assistance include home health care, adult day care, and assisted-living

programs. Alzheimer's patient-support groups and caregiver groups can be important sources of information and referral, and they sometimes coordinate "share-care" programs that enable caregivers to take needed breaks. Here are some other suggestions that can, in the long run, enable you to take better care of yourself and your loved one:

- Be alert to signs of depression, and seek treatment if you have symptoms such as persistent sadness, especially in combination with sleep disturbances and/or a loss of pleasure from things you normally enjoy.
- Join a support group for caregivers, especially one for caregivers of people with Alzheimer's (if possible). Many online caregiver communities can provide support if there is no group in your area. These include the Alzheimer's Association, which has message boards at www.alz.org/living_with_alzheimers_message_boards_lwa.asp; ElderCare Online, which lists support networks at www.ec-online.net/alzchannel.htm; and the Family Caregiver Alliance, with groups available via www.caregiver.org.
- Seek psychological and emotional support from family, or friends, counselors, clergy, or community groups.
- Don't isolate yourself; maintain social networks.
- Allow yourself to take regular breaks to pursue things you enjoy doing; arrange for others to stay with your loved one if necessary.
- Don't be afraid to ask for help; seek help from community services or home-health agencies if needed. Schedule regular health checkups for yourself, and be sure to tell your doctor about your caregiving role.



Depression

We all feel blue occasionally or are faced with events that deeply sadden us. Few people have not felt the pain of a job loss, a strained relationship, or the death of a loved one. Heartache and

grief are natural parts of life. But sadness that persists and interferes with regular activities could be depression.

Depression, like high blood pressure or diabetes, is a

serious medical disorder with biological causes. Getting effective treatment can sometimes be a difficult and lengthy process, but doing so is critical to preventing serious consequences and improving the quality of one's life.

Myths and Misperceptions

Many people mistakenly believe that depression is normal for older people or that little can be done about it. But it is not an inevitable part of aging; 2010 survey data from the Centers for Disease Control and Prevention suggest that depression is most common in people ages 45 to 64, but least common in people ages 65 or older. And when it does occur, something can be done about it.

Depression does not represent a character flaw or a sign of weakness, nor is it just something we should be able to “snap out of” if we are strong enough. Depression is not something that enough willpower can control, nor is it something to be ashamed of. Such myths and stereotypes contribute to the underrecognition and undertreatment of

depression and other mental disorders.

Some studies show that less than one-fourth of people with depression are accurately diagnosed and adequately treated. The problem may be worse among older adults, because the recognition of depression is often complicated by the co-occurrence of other medical conditions and by the mistaken perception among both patients and health professionals that depression is a normal response to other serious illnesses or hardships that often accompany aging.

Left untreated, depression wreaks havoc on a person's quality of life, may worsen symptoms of other diseases, and even can be fatal. People who have suffered a stroke or heart attack, for example, are more likely to die if they have depression. People with diabetes who are depressed are less likely to comply with medical therapy and more likely to suffer serious complications.

Moreover, depression is a primary risk factor for suicide; major depressive disorders

account for 20 to 35 percent of all suicide deaths. Suicide rates of older adults are among the highest of any

age group, and non-Hispanic white males over age 85 have the highest suicide rate of all age and ethnic groups.

If you are in crisis and need help right away:

Call this toll-free number, available 24 hours a day, every day: **1-800-273-TALK** (8255). You will reach the National Suicide Prevention Lifeline, a service available to anyone. You may call for yourself or for someone you care about. All calls are confidential.

Depression is more than feeling blue. Deep sadness is often compounded by other emotional, mental, and physical symptoms. The cardinal symptoms of major depressive disorder are depressed mood and loss of interest or pleasure (sometimes called anhedonia). Other symptoms vary enormously, may range from mild to severe, and may wax and wane over time. When symptoms interfere with normal, day-to-day activities, depression may be the cause.

If you notice any of these symptoms in yourself or a loved one, seek medical treatment and ask to be screened for depression:

- Prolonged sadness or unexplained crying spells
- Significant changes in appetite and sleep patterns (either less or more)
- Irritability, anger, worry, agitation, anxiety, pessimism, indifference
- Loss of energy and enthusiasm, persistent sluggishness
- Feelings of guilt, worthlessness, hopelessness, helplessness
- Inability to concentrate to make decisions
- Loss of enjoyment from once-pleasurable activities
- Withdrawal from social contacts; isolation
- Unexplained aches and pains
- Recurring thoughts of death or suicide
- Memory loss

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What Causes Depression?

Depression is a brain disorder characterized by impaired regulation of certain brain chemicals called neurotransmitters. According to the National Institute of Mental Health, recent brain-imaging research has linked depression to malfunctioning in some of the brain circuits responsible for mood, sleep, appetite, thinking, and behavior. Scientists are still trying to determine what causes the chemical imbalances and circuit disruptions of depression and how exactly they relate to symptoms. Such changes may be the result of other, yet unexplained physiological processes.

What triggers depression in one person versus another is an area of intense research, but many questions remain unanswered. A combination of genetic, environmental, and psychological factors is thought to be involved.

The precise contribution of inherited genes remains unclear. Some types of depression run in families, suggesting a genetic basis for the disorder. However,

many people with depression have no family history of the disorder, and not everyone with a family history of depression develops the condition. As with most mental health conditions, no single gene has been linked definitively to depression, making it probable that multiple genes interact with environmental triggers to increase an individual's susceptibility.

Circumstances that might trigger depression include grief, chronic health problems, serious financial difficulties, or problems in relationships—situations that put an individual under serious stress. (See “What’s New in Brain Research,” page 20.)

Depression in older adults can also be caused by the following:

- Changes within the family
- Chronic pain and illness
- Difficulty getting around
- Frustration with memory loss
- Loss of a spouse or a close friend
- Trouble adapting to a life change, such as moving from a house to a retirement facility

Psychological factors that are linked to depression include low self-esteem, consistent pessimism, neuroticism (an enduring tendency to experience negative emotional states such as anxiety, anger, and guilt), and a tendency to be overwhelmed by stress. These attributes may in fact signify subsyndromal depression—defined as a condition with symptoms that fall short of meeting the full diagnostic criteria for major depression but which may predispose a person to depression.

Depression and Other Medical Illnesses

Depression can also be a sign of another medical problem. According to the American Association of Geriatric Psychiatry, chronic or serious illness is the most common cause of depression in older adults. Depressed mood and related symptoms can be a reaction to the illness or can be caused by the disease itself and may be complicated by brain disorders that occur with age, such as Alzheimer's disease. Depression is also a side effect of many drugs commonly prescribed for older adults.

In addition, many chronic medical conditions may set off changes in the brain that make a person more susceptible to depression. People over 65 are more likely to have one of these conditions with which depression often co-occurs:

- Heart disease
- Stroke
- Cancer
- Chronic lung disease
- Diabetes
- Parkinson's disease
- Anxiety disorders
- Hormonal disorders

What's New in Brain

Research: Sorting Out the Stress-Depression Link

Stress is thought to play a bigger role in triggering depression in older people than in other groups, according to the American Association of Geriatric Psychiatry. Brain research continues to build on evidence linking stressful life events, such as the loss of a loved one or prolonged health problems, to the onset of depression. Some studies have found, for example, that the brain system that regulates the body's response to

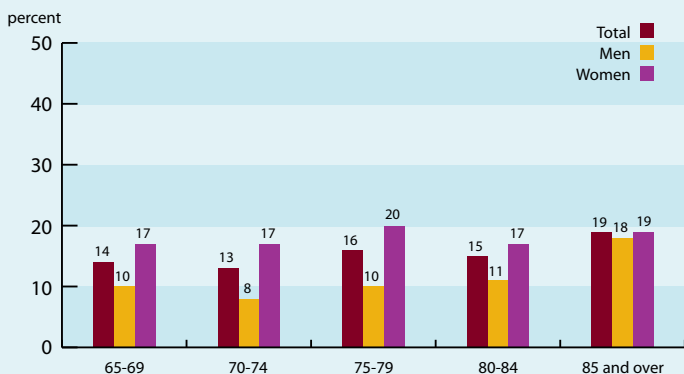
stress is overactive in many people with depression.

When faced with a stressor, the brain triggers the release of a flood of powerful stress hormones, which help the body respond to the stressful event (the so-called fight or flight response). If the stress system is persistently activated, as when we experience stress chronically or repeatedly, the system can malfunction and fail to shut off the cascade of hormones properly. Stress hormones are known to cause damage to nerve cells in certain brain regions, including the hippocampus, which many studies have found to be significantly shrunken in people with long-term depression. Some scientists believe that a prolonged “bath” of stress hormones sets off brain changes that eventually lead to depression or raise a person’s risk for mood disorders.

At the same time, surprisingly little evidence indicates that stress directly causes depression in humans. It may have a more subtle impact, by priming the brain, in effect, to be more susceptible to other insults that may compound damage from stress hormones. Or, the effect of stress may be limited to people with certain genetic characteristics that are as yet unidentified.

While brain researchers continue to piece together the puzzling link between stress and depression, one thing seems clear: Taking positive steps to manage stress throughout life can help prevent accumulated damage to the stress-response circuit in the brain and may reduce one’s risk for depression in later life.

FIGURE 2: Clinically relevant depressive symptoms among the population age 65 and over, by age group and sex, 1998–2006.



NOTE: The definition of "clinically relevant depressive symptoms" is four or more symptoms out of a list of eight depressive symptoms from an abbreviated version of the Center of Epidemiological Studies Depression Scale (CES-D) adapted by the Health and Retirement Study (HRS). The CES-D scale is a measure of depressive symptoms and is not to be used as a diagnosis of clinical depression. A detailed explanation concerning the "four or more symptoms" cut-off can be found in the following documentation: <http://hrsonline.isr.umich.edu/docs/userg/dr-005.pdf>. Proportions are based on weighted data using the preliminary respondent weight from HRS 2004. Reference population: These data refer to the civilian noninstitutionalized population. Source: Health and Retirement Study.

Managing Stress

Mind the basics: Eat healthy, well-balanced meals; get enough sleep (seven to nine hours per night for most people); and exercise regularly.

If something is causing you stress, take some kind of action that affords you a modicum of control over the situation, even if only in a small way.

Recognize that there are some things you cannot control and focus your energies on those you can. Learn to let go of those you can't (such as a traffic jam or a long line at the grocery store).

Use relaxation strategies such as deep breathing; meditation; yoga or stretching; walking; or guided-imagery recordings that help you transport yourself mentally to a calm, peaceful state of mind.

Put things in perspective: Consider what is most valuable to you, set realistic goals, and develop a road map for achieving them. Then take action—even if only small steps—and celebrate each success, however incremental.

Develop a sense of humor, and put some fun into your life by pursuing activities you enjoy or trying new things.

Stay in regular contact with friends and family members whom you enjoy being with and who can provide a network of social support to assist you when you need help or simply want to interact.

Practice gratitude: Start your day by calling to mind all the things for which you are grateful. This can help you refocus your mind on the positive aspects of your life and away from worries or anxieties.

Getting Help for Depression

Depression in older adults is a widespread problem that frequently goes undiagnosed and undertreated. Many older people will not admit that they have signs and symptoms of depression for fear that they will be seen as weak or crazy. Some older people may be aware of their depression but may think that nothing can be done about it.

The same negative thoughts and feelings often associated with a depressive disorder—exhaustion, worthlessness, helplessness,

and hopelessness—can work against getting help for the disorder. It's important to recognize that these feelings are part of the condition and will improve with proper treatment.

If you think you may be depressed, talk to your doctor about your concerns as soon as possible. Ask to be screened for depression and discuss possible treatment options. Your doctor will want to rule out other possible causes of the symptoms you are experiencing, so be sure to communicate as best you can what those symptoms

are, what medications you're taking, what other conditions you have, and what is going on in your life that could be affecting your mood.

To diagnose depression, your doctor should take several steps:

- Conduct a thorough physical examination and laboratory tests to rule out other problems.
- Interview you to elicit details about symptoms, including:
 - when they started
 - how long they have lasted
 - how severe they are
 - whether you have had them before. If so, when? Were they treated? If so, how?
- Take a complete personal and family medical history, including details about any relatives with depressive symptoms.
- Have you take a pen-and-paper mental status examination, which is designed to identify any effects on speech, memory, or thought patterns. The most commonly used test is called the Mini Mental State Examination (MMSE).

Keep in mind that primary care physicians often do not diagnose depression properly, and the problem is compounded in older people. It may be necessary to seek the help of a specialist such as a geriatric psychiatrist, a doctor who is specially trained to recognize and treat mental health problems in older people.

Treatment for depression

Even when depression is recognized, people may not get adequate treatment. However, once the right therapy is found, most people with depression can be treated effectively, which improves quality of life and reduces the risk of suicide and premature death from other medical conditions.

Treatment for depression may need to continue for a long time—perhaps even indefinitely—just as treatment for chronic medical conditions such as diabetes or high blood pressure often must continue throughout life. A combination of antidepressant medications and psychotherapy (talk therapy) is often the most effective treatment approach, especially in older people.

Some studies have found that people over 75 may respond more slowly to treatment and may be more likely to experience a recurrence of depression, even with treatment. However, other studies have shown that patients ages 70 and over who become symptom-free and continue to take their medication for two more years are 60 percent less likely to relapse than those who discontinue their medication. For these reasons, people with depression should see their doctors regularly for any necessary treatment adjustments.

Current antidepressants influence the function of neurotransmitters. Three major types of antidepressants are available: tricyclic antidepressants, monoamine oxidase inhibitors, and selective serotonin reuptake inhibitors (SSRIs). Developed more recently, SSRIs tend to have fewer side effects than the older drugs. Different people respond differently to antidepressants, and finding the one that provides effective relief of symptoms often requires trial and error. Sometimes the dose may need to be

adjusted, or a combination of medications may be needed. The full effect of an antidepressant may not occur for four to eight weeks, sometimes longer. If several weeks on one medication does not lead to improvement, another one should be tried.

Psychotherapy is an important part of depression treatment, particularly in older people. The most effective types of psychotherapy for depression include cognitive-behavioral therapy and interpersonal therapy. Administered by a psychiatric professional (usually a psychiatrist or a licensed psychotherapist), these talk therapies aim to help a person develop strategies for coping with day-to-day challenges, for learning to counter negative thoughts and behaviors that accompany depression, and for resolving any relationship conflicts that may be contributing to depression. People with short-term depression, such as that associated with medical illness, trauma, or loss of a loved one, may benefit from shorter courses of psychotherapy. When depression is

particularly severe, or when antidepressants either cannot be taken or are ineffective, a doctor may recommend electroconvulsive therapy (ECT). ECT stimulates specific parts of the brain with brief, low-level electrical impulses, which are not consciously felt by the patient. In some people, symptom resolution may occur immediately, but in others, several sessions of ECT may be necessary for full effect.

Getting the right treatment for depression is critical, and there can be comfort in knowing that help is available. The first step is to take action: See your doctor, ask to be screened for depression, learn what treatment options are available, follow the prescribed therapy carefully, and communicate regularly with your doctor about any changes—or absence of changes—in mood or other symptoms.

Tips for Living with Depression

Meet with your doctor regularly for ongoing assessments of your health and progress in treating depressive symptoms.

Set realistic daily goals for yourself and prioritize your activities.

Break down large tasks into smaller ones that you can accomplish more readily.

Don't isolate yourself; socialize with other people.

Talk with someone about your feelings—a friend or family member, doctor, professional counselor, or clergy member.

Try to **continue participating** in activities that you have enjoyed.

Exercise regularly; studies show it improves mood and overall health.

Give yourself time; even with treatment, your mood may not improve immediately, but you should notice improvement within several weeks.

If you can, **postpone important decisions** until you're feeling better, or discuss matters with someone who might have an objective view.

Don't be afraid to ask for help, and accept help that is offered.



If You Suspect Depression in Someone Else

Many times, depression is first recognized by close friends or loved ones who notice a change in mood or behaviors. Family support can make a huge difference in helping people with depression get the treatment they need. If you suspect that someone

you care about may be depressed, talk to him or her about it. Gently ask questions, listen carefully, and watch for telltale signs such as decreased interest in favorite activities. Recognize that it may be easier for some people to acknowledge physical changes, such as sleep difficulties or loss of

appetite, than to talk about feelings such as worthlessness or hopelessness. Some studies have suggested that men may have more difficulty than women in talking about such problems.

How to help friends or loved ones who may be depressed:

- Help them get evaluated and treated; be prepared to accompany them to the doctor if necessary.
- Encourage them to follow treatment regimens properly and to seek different treatment if improvement does not occur.
- Offer emotional support (understanding, patience, affection, and encouragement).
- Do not ignore remarks about suicide; report them to their doctor or encourage them to seek help immediately from a doctor or suicide-prevention program.
- Reach out: Invite them to do things, stay in touch with visits and phone calls, and be a good listener.
- Be gentle but persistent in offering help and companionship; people with depression may avoid other people or resist offers of help.
- Gently encourage involvement in activities they once enjoyed.
- Do what you can to minimize demands so that they do not feel overwhelmed or inadequate.



Stroke

Stroke is the number three cause of death in the United States and a leading cause of serious, long-term disability. On average, someone suffers a stroke every 45 seconds,

and someone dies of a stroke every three minutes. If someone is showing signs of a stroke, immediately seeking medical treatment offers the best chance of survival and recovery.

A stroke, or “brain attack,” occurs when blood flow to the brain is interrupted, shutting off essential nutrients and oxygen that brain cells need to survive. Within a few minutes of a stroke, brain cells start to die, which sets off a cascade of damage to nearby and interconnected cells. Swelling and toxins released by dying nerve

cells may progressively broaden the area of damage. Depending on where damage occurs in the brain, strokes can cause mental and physical changes, including paralysis, vision and speech problems, memory loss, balance problems, stiffness and tightness in muscles, and depression.

The two types of strokes are ischemic, which accounts for about three-quarters of strokes, and hemorrhagic. Ischemic strokes occur when plaque buildup or a blood clot blocks or narrows a blood vessel. Such strokes occur most often in the carotid artery, the main artery that carries blood to the brain. Hemorrhagic strokes are further subdivided. Subarachnoid hemorrhages happen when an aneurysm—a weakness in a blood vessel—ruptures, causing bleeding in the surrounding brain areas. An intracerebral hemorrhage occurs when blood leaks from a torn blood vessel deep in the brain.

If stroke symptoms last only a few minutes and cause no permanent damage, the culprit may be a transient ischemic attack, or ministroke. Such attacks occur when a clot blocks a blood vessel only temporarily; symptoms last for only about a minute, on average. Yet it is still important to seek treatment. A transient ischemic attack may be a warning of an impending stroke; about one in three people who have a transient ischemic attack eventually have a stroke. When a stroke does follow, chances are about 50 percent that it will occur within a year of the transient ischemic attack.

Seeking treatment following a transient ischemic attack is an opportunity to prevent a future stroke. Treatment with blood thinners, such as aspirin or heparin, may reduce the risk. For some patients, doctors may recommend surgery. On a more basic level, patients can take steps to address underlying risk factors for stroke (see “Risk Factors and Prevention,” page 31).

What You Should Know

Treat any symptoms of stroke, even temporary symptoms, as an emergency and seek immediate medical attention. For some people with ischemic stroke, “clot-busting” drugs, including tPA, short for tissue plasminogen activator, can limit brain damage, but only if they are administered within three hours of the stroke’s onset.

Warning Signs of Stroke

Any of these symptoms could indicate a stroke:

- Sudden numbness, weakness, or paralysis in the face, arm, or leg (often on one side of the body)
- Sudden difficulty talking or understanding speech
- Sudden confusion
- Vision disturbances
- Dizziness
- Severe headaches

If you think someone may be having a stroke, Act **FAST**:

FACE

Ask the person to smile.
Does one side of the face droop?

ARMS

Ask the person to raise both arms.
Does one arm drift downward?

SPEECH

Ask the person to repeat a simple sentence.
Are the words slurred? Can he or she repeat the sentence correctly?

TIME

If the person shows any of these symptoms, time is important. Call 911 or get to the hospital fast. Brain cells are dying.

Source: National Stroke Association

Risk Factors and Prevention

Some primary risk factors for stroke are not controllable. Starting at age 55, the risk of having a stroke more than doubles with each decade of life. If a parent, grandparent, sister, or brother has had a stroke, your risk is higher, suggesting a possible hereditary vulnerability. Risk also increases for people who have had a stroke, transient ischemic attack, or heart attack in the past. About one-quarter of people who recover from a first stroke will have another one within five years.

Stroke is more common in men than in women, though women account for more than half of stroke deaths. “Hidden” risk factors for women include certain types of migraines, taking birth control, hormone replacement therapy, certain autoimmune diseases that are more common in women (such as lupus), more than one miscarriage, and some clotting disorders.

Race is also a risk factor. Blacks and Hispanics are at higher risk, in part because these groups have higher rates of high blood pressure, diabetes, and obesity. Studies also have suggested that Hispanics are more likely to

suffer hemorrhagic strokes.

Drug treatments and changes in lifestyle can help address other primary risk factors and thus can help prevent strokes. These risk factors include smoking, excessive alcohol use, diabetes, high blood pressure, obesity, high levels of cholesterol and other lipids, artery or heart disease, sickle-cell disease, poor diet, and inactivity.

Reduce Your Risk

You can take action to lower your risk of stroke. Some of the primary treatable conditions linked to stroke are listed on the next page, with steps you can take to address them.



Risk Factor

Action Plan

High blood pressure

Treat it. Eat a balanced diet, maintain a healthy weight, and exercise to reduce blood pressure. Drugs are also available.

Cigarette smoking

Quit. Medical treatment can help.

Heart disease

Manage it. Your doctor can treat your heart disease and may prescribe medication to help prevent the formation of clots. If you are over 50, scientists believe you and your doctor should make a decision about aspirin therapy.

Diabetes

Control it. Treatment can delay complications that increase the risk of stroke.

Transient ischemic attacks (TIAs)

Seek help. TIAs are small strokes that may last for only a few minutes. They should never be ignored and can be treated with drugs or surgery.

Source: National Institute of Neurological Disorders and Stroke

Diagnosing Stroke

To diagnose stroke, a doctor will consider a patient's medical history, conduct physical and neurological exams, and study the results of a variety of tests: blood tests, imaging and electrical scans of the brain, and blood-flow tests. Most of these tests are painless.

Magnetic resonance imaging (MRI) is a common imaging test. It employs a magnetic field—and no radiation—to scan the brain and to provide a picture of the location and the extent of injury. MRI provides a sharper image than a computed tomography (CT) scan and thus can give doctors a better look at small injuries deep in the brain.

Tests of the brain's electrical activity include an electroencephalogram, in which electrodes placed on the scalp record electrical impulses. A computer translates the results into brain-wave patterns. A second test, called evoked response, measures the brain's electrical response to different sensory information. In this test, electrodes measure impulses related to hearing, body sensation, or vision.

Most blood-flow tests employ ultrasound technology to look at a problem artery and determine the amount of blood flow. B-mode imaging, Doppler testing, and duplex scanning are examples of informative blood-flow tests.

A doctor may also conduct a medical procedure called angiography to determine blood flow. Similar to a cardiac catheterization, a catheter is placed in the arteries of the brain, where it injects a special dye ahead of an X-ray. The result enables the doctor to examine the size and location of blockages, and it can be especially helpful in the diagnosis of aneurysms and poorly formed blood vessels.

Treatments for Stroke

Possible stroke treatments include drugs that break down blood clots, such as the previously mentioned tissue plasminogen activator (tPA). Such intravenous drugs must be administered within three hours of the onset of symptoms to have a good chance of working. When they do work, these “clot-busting” drugs can reduce permanent damage. But only 3 to

5 percent of stroke victims reach the hospital in time to be considered for such treatment.

Aspirin is less remarkable but still helpful in the hours following a stroke; it can help prevent a second stroke from occurring soon after an initial one. Over the longer term, aspirin and other blood thinners such as warfarin can help prevent stroke by interfering with the blood's ability to clot. Aspirin and other drugs known as antiplatelets do not break down an existing clot, but they do help prevent a new one from forming or growing. Aspirin can help prevent an initial stroke from occurring as well.

Warfarin is a kind of anti-coagulant drug. These drugs are considered stronger than antiplatelets; they also tend

to be more expensive and to have a higher risk of serious side effects. They react more with other drugs, as well as with certain foods. However, they have been quite effective in stroke patients with a heart-rhythm disorder called atrial fibrillation.

Drugs are not the only method of preventing another stroke. A doctor might surgically remove plaque that is blocking blood vessels in the carotid artery in a procedure called a carotid endarterectomy. A newer procedure involves threading a catheter up from the groin. Once it reaches the carotid artery, a balloon expands the artery and implants a stent to keep it open. Doctors must consider whether the potential benefits from these procedures outweigh their risks.

Recovering from Stroke

According to the National Stroke Association, 10 percent of stroke survivors recover almost completely, 25 percent recover with minor impairments, 40 percent experience moderate to severe impairments requiring special care, 10 percent require care in a nursing home or other long-term care facility, and 15 percent die shortly after the stroke.

Advances in our understanding of how the brain functions and repairs itself following injury have improved stroke recovery. Beginning rehabilitation immediately seems to be critical to helping stroke victims learn new ways to perform tasks or to compensate for lost abilities.

Researchers are investigating which rehabilitation strategies work best for which people. The most important element of rehabilitation after a stroke is the key for anyone trying to learn a new skill: carefully directed, focused, repetitive practice.

Initial therapy starts as soon as a stroke patient's medical situation has stabilized. Because many patients have partial paralysis or serious weakness, often the first focus is independent movement—changing positions frequently, for example, or trying exercises to improve range of motion. When possible, survivors move on to sitting up, transferring from a bed to a chair, standing, bearing their own weight, and walking.

Rehabilitation therapists help patients attempt increasingly demanding tasks, such as bathing, dressing, and using the bathroom. Depending on the severity of the stroke, this type of rehabilitation can be an ongoing process for months or years after the stroke.

For patients who have lost the use of a limb, one approach that has garnered a great deal of attention is so-called constrained-limb rehabilitation, in which the “good” arm or leg is immobilized to force the use of the “bad” limb. This therapy is believed to help rewire the brain after stroke and has shown promise in early clinical studies.

A stroke also can impair speech; at least a quarter of stroke survivors have language impairments, such as aphasia. People with one type of aphasia have trouble conveying thoughts via spoken and written language. A second type involves difficulty understanding the spoken or written word and also often results in incoherent speech. A third type, global aphasia, is the result of damage to multiple brain areas involved with language. People with global aphasia lose almost all linguistic ability.

Speech-language pathologists help stroke survivors with aphasia relearn how to use language or communicate in other ways. Some types of short-term therapy can rapidly improve comprehension. At the center of language rehabilitation are intensive exercises such as repeating a therapist's words, practicing following directions, and doing reading or writing exercises. Advances in computer technology are creating new rehabilitation methods, too.

Stroke survivors often experience other difficulties, including pain, thinking and memory problems, and emotional and behavioral disturbances. Doctors and other rehabilitation specialists can help patients and their families deal with these difficulties. Having a strong support network also can be helpful (see the Resources section at the end of this booklet).



Parkinson's Disease

Parkinson's disease (PD) is a chronic, progressive movement disorder that occurs when brain cells that produce the neurotransmitter dopamine die, creating a shortage of this important chemical in the brain. The cause of the disease is unknown, and identifying risk factors has been difficult. Although there is presently no cure, treatment options including medication and surgical interventions may help manage its symptoms.

Known risk factors include age—the average age of onset for the disease is

60—but people as young as 18 have been diagnosed. Other risk factors include having a close relative with the disease or having had ongoing exposure to herbicides and pesticides. Men are more likely than women to develop Parkinson's.

Estimates suggest that at least 1 million people in the United States have Parkinson's disease. Patients progress through a series of stages that have been defined on a scale called the Hoehn and Yahr Staging of Parkinson's Disease.

Hoehn and Yahr Staging of Parkinson's Disease

Stage one	Symptoms on one side of the body only.
Stage two	Symptoms on both sides of the body. No impairment of balance.
Stage three	Balance impairment. Mild to moderate disease. Physically independent.
Stage four	Severe disability, but still able to walk or stand unassisted.
Stage five	Wheelchair-bound or bedridden unless assisted.

Source: National Institute of Neurological Disorders and Stroke

Symptoms

The first symptom of PD is often tremor (trembling and shaking) in an arm or a leg, especially when at rest. Other common physical symptoms include slow movement, an inability to move, stiff limbs, a shuffling gait, and a stooped posture.

Symptoms usually start on one side of the body, and in most cases they remain worse on that side as the disease progresses. In some cases, people with PD may not show their usual facial expressions or may speak in a soft voice. They may suffer nonphysical symptoms such as dementia or confusion, sleep disturbances, depression, or compulsive behavior.

Symptoms of Parkinson's Disease

Tremor. The characteristic shaking associated with Parkinson's disease often begins in a hand. A back-and-forth rubbing of your thumb and forefinger, known as pill-rolling, is common and may occur when your hand is at rest. However, not everyone experiences tremors.

Slowed motion (bradykinesia). Over time, Parkinson's disease may reduce your ability to initiate voluntary movement. This may make even the simplest tasks difficult and time-consuming. When you walk, your steps may become short and shuffling, or your feet may freeze to the floor, making it hard to take the first step.

Rigid muscles. Muscle stiffness can occur in any part of your body. Sometimes the stiffness can be so severe that it limits the range of your movements and causes pain. People may first notice this sign when you no longer swing your arms when you're walking.

Impaired posture and balance. Your posture may become stooped as a result of Parkinson's disease. Balance problems also may occur, although this usually happens in the later stages of the disease.

Loss of automatic movements. Blinking, smiling, and swinging your arms when you walk are all unconscious acts that are a normal part of being human. In people with Parkinson's disease, these acts tend to be diminished and even lost. Some people may develop a fixed staring expression and unblinking eyes. Others may no longer gesture or seem animated when they speak.

Speech changes. Many people with Parkinson's disease have problems with speech. They may speak more softly, rapidly, or in a monotone, sometimes slurring, repeating words, hesitating before speaking.

Dementia. In the later stages of Parkinson's disease, some people develop problems with memory and mental clarity. Alzheimer's drugs appear to alleviate some of these symptoms to a mild degree.

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Diagnosing Parkinson's

The cause of Parkinson's disease is not clear. Some people may inherit a genetic vulnerability, but the disease's onset is believed to depend on

environmental factors as well. There is no test that clearly identifies PD in a patient, so diagnosis requires a careful evaluation of symptoms, including how severe they are and when they started.

Testing a patient's responsiveness to Parkinson's medications can provide further evidence that Parkinson's is the correct diagnosis. A neurologist with experience with Parkinson's or other movement disorders may be best suited to diagnose PD.

Some Parkinson's symptoms are also symptoms of other diseases, and the rate of misdiagnosis is high; studies in the United States and Europe each found a misdiagnosis rate of about 24 percent. A slew of other disorders may have parkinsonian symptoms. Rare types of encephalitis viruses, for example, can cause a severe parkinsonian movement disorder.

Certain drugs, including some antipsychotics, may cause symptoms as well. Muhammad Ali has another Parkinson's-like disorder, post-traumatic parkinsonism, which results from severe head injury or repeated trauma.

Tremors—particularly during movement rather than at rest—may be a sign of a condition called essential tremor. This common condition often runs in families and progresses slowly. The tremor is usually equal in both hands, and patients have no

other parkinsonian features. Essential tremor does not lead to Parkinson's, although it can occur in a patient who also has Parkinson's.

A type of dementia that features abnormal protein deposits called Lewy bodies in certain brain areas also may cause parkinsonian symptoms that fluctuate significantly. Visual hallucinations and cognitive problems may be early symptoms of dementia with Lewy bodies, and delusions and depression may also occur.

Dementia with Lewy bodies is often included among "Parkinson's-plus" diseases, so called because their symptoms include but are not limited to those that appear with Parkinson's disease. Other disorders in this group include multiple system atrophy and progressive supranuclear palsy.

Scientists are constantly searching for new or refined treatment methods for Parkinson's, and they are making progress with the help of clinical trials. In some Parkinson's cases, specific genes have been linked to the disease, and this is helping researchers understand how it occurs and identify new drug targets.

They also are looking for a biomarker—a biochemical abnormality that all patients with Parkinson’s might share—that screening techniques or a chemical test could pick up. Such screening could help doctors pinpoint patients at risk for the disease before symptoms appear, and it also could help researchers identify treatments that could hinder the disease process in its early stages.

Treatments

Although Parkinson’s disease has no cure, treatments abound—and many patients may not require treatment for Parkinson’s for several years, until they have progressed to a more advanced stage. When symptoms become severe, medications or surgery sometimes provide significant relief.

Drugs

Drugs for Parkinson’s come in three categories. One group includes drugs that increase the level of dopamine in the brain, either directly or indirectly. Levodopa is one example. This simple chemical crosses the blood-brain barrier and then changes into dopamine. Other drugs mimic dopamine or get in the way of its breakdown.

Drugs in a second group affect other neurotransmitters to ease Parkinson’s symptoms. For example, drugs that interfere with the neurotransmitter acetylcholine can help reduce tremors and muscle stiffness, which can result from having more acetylcholine than dopamine.

Parkinson’s medications in the third category help control symptoms unrelated to movement. For example, antidepressants may be prescribed to people experiencing Parkinson’s-related depression.

Several new drug treatments are being tested in clinical trials, with goals that include reducing symptoms, halting disease progression, and healing damaged brain cells.

Surgery

Patients and doctors may also consider surgical therapies. A type of brain surgery called pallidotomy, which involves destroying a small area of brain cells in a part of the brain that contributes to Parkinson’s symptoms, was once common but then took a back seat to drug therapies. Although pallidotomy has been greatly refined, it still permanently destroys brain tissue.

Deep-brain stimulation (DBS) is a newer technique that mainly helps to reduce tremor. It involves implanting a pace-makerlike device into the brain, and connecting it to a pulse generator just under the collarbone. The success rate of deep-brain stimulation is high, and it is both painless and flexible—it does not destroy brain tissue, and the amount of stimulation is adjustable via external programming.

DBS does not stop the progression of Parkinson's, but early studies that track patients up to several years after surgery have shown that it can alleviate symptoms over the long term. Thanks to its success in treating Parkinson's, DBS is now being used to treat other movement disorders such as dystonia and essential tremor.

Other therapies may also help alleviate Parkinson's symptoms. Physical, occupational, and speech therapy can help address problems with gait, tremors and rigidity, voice, and cognitive decline. Exercise can help with mobility, flexibility, strength, balance, and emotional well-being. Researchers are studying whether changes in diet or dietary supplements may be useful, but results thus far are inconclusive. Of course, sticking to a healthy diet can help with general well-being.

Researchers are working to improve deep-brain stimulation technology and surgical techniques, and they are testing whether other kinds of brain stimulation can also reduce Parkinson's symptoms. Stem-cell, gene, and vaccine therapies also are under study.



Chronic Pain

Acute, temporary pain is a normal function of the nervous system—our bodies telling us that we may be newly injured and need to respond. But when pain is persistent or recurrent, it is called chronic pain. Scientists believe that

chronic pain results when pain signals get switched on and don't shut off properly, which amplifies the signals and intensifies the pain.

More than 48 million Americans have chronic pain,

whose cause may be one of many chronic health conditions—or may be difficult to identify. Among the most common types of chronic pain are low back pain, bone and joint pain, headache or migraine, cancer-related pain, and pain from diseases that affect the muscles.

Pain is the body's way of telling us something is wrong; ignoring it or "toughing it out" is not a good idea. Persistent unrelieved pain appears to change the brain's "pain pathways," fueling a vicious cycle that makes us subsequently more sensitive to pain.

Potential Causes

Chronic pain comes in two varieties: nociceptive and neuropathic.

When you bite into a hot pepper, touch a hot stove, or walk outside on a bitterly cold day, the pain you feel comes from peripheral nerve

receptors called nociceptors. But nociceptors also respond to internal problems, such as chemicals released from damaged cells. Persistent headaches, arthritis, and fibromyalgia are examples of chronic nociceptive pain.

Neuropathic pain, on the other hand, comes from within the nervous system itself. Its cause is something other than an abrupt injury or disease process. People who experience neuropathic pain often describe a burning or stabbing sensation. The pain that shingles causes is one example of neuropathic pain.

Chronic pain can be both a symptom and a condition that requires its own treatment. The American Chronic Pain Association lists no fewer than 55 conditions or syndromes with which chronic pain may be associated. Just a few conditions that often involve chronic pain appear in the table on page 43.

Possible Causes of Chronic Pain

Condition	Pain-related Symptoms	Cause is one example of neuropathic pain
Arthritis	Joint pain	Inflammation, damage to joint tissue
Cancer	Pain in nerves, bones, or other organs	Tumor itself or treatment side effects
Chronic fatigue syndrome	Muscle pain, joint pain, headache	Unknown; possibilities include viral infections and psychological stress
Complex regional pain syndrome	Pain and stiffness, usually in the arms and legs	Usually follows illness or injury
Fibromyalgia	Widespread pain in muscles, ligaments, and tendons, as well as in places where slight pressure causes pain	Unknown; often follows physical or emotional trauma
Headache	Pain anywhere in the head	Many; possibilities include chemical, nerve, or muscle activity, or an underlying condition
Rheumatoid arthritis	Painful swelling in lining of the joints	Autoimmune disorder
Sickle-cell anemia	Pain in the chest, abdomen, joints, and/or bones	Hereditary; sickle-shaped red blood cells block blood flow

Treating Pain

Treating chronic pain can be difficult, both because levels of pain are subjective and because its cause or causes may be unknown. A combination of different types of treatment may be more effective than any one type on its own.

Many kinds of painkillers, such as aspirin and acetaminophen (such as Tylenol), are familiar to us. Other types include anti-inflammatory drugs: ibuprofen, naproxen, and newer types, including what are known as COX-2 inhibitors. In some cases, antidepressant or anticonvulsant drugs are useful. Opioid drugs such as morphine can help relieve more serious pain.

Lifestyle changes also can help relieve pain. Steps you can take include exercising regularly, eating a balanced diet, and getting enough sleep. Relaxation techniques such as yoga may also help. So too might nondrug treatments such as acupuncture or certain kinds of nerve stimulation. Surgery may be an option for persistent, severe pain.

Even as better treatments become available, pain

continues to be undertreated, especially among older adults, women, and minorities. Untreated pain can make other health problems worse, interfere with healing, and slow recovery from surgery or trauma. Honest, open communication with health care providers about pain levels is essential to proper management. Resist the temptation to believe that pain is “just something I have to live with”—it isn’t!

Pre-emptively striking at pain before it starts may be an effective control strategy: Patients who receive pain medication before undergoing surgery may have less pain afterward and recover more quickly. Taking medication at set intervals, rather than waiting for pain to intensify before taking another dose, may also be beneficial for chronic pain.

As scientists achieve a better understanding of the biology of pain, new and more effective pain medications and approaches to pain control are becoming available. For example, personal “pumps” let patients administer pain medicine as they need it, and

surgical procedures may be used to block pain pathways in the spinal cord.

One reason pain is under-treated may be that patients and doctors are concerned about addiction to strong painkillers such as morphine and other opiates. However, research shows that these fears are unfounded: Most people with chronic pain who take these medicines as prescribed do not become addicted. Those at risk for addiction tend to have a history of substance abuse or serious psychological problems.

Living with Chronic Pain

In recent decades, the medical community has increasingly recognized the scope of chronic pain as a physical problem and has rejected the idea that pain without an obvious cause is “all in the mind.” Doctors and scientists have come to acknowledge the effects persistent pain can have on a patient’s state of mind and immune system, as well as on the patient’s family.

Scientific advances are continually leading to better

pain treatment. Putting up with pain may make us more sensitive to pain over the long term. The medical community’s attitude toward pain has changed, and dealing with a loved one’s pain can be difficult. For all of these reasons, seeking early treatment for pain is a good call.



Resources

AARP

601 E Street, NW
Washington, DC 20049
1-888-OUR-AARP (1-888-687-2277)
Spanish: 1-877-MAS-DE50
(1-877-627-3350)
International Calls: 1-202-243-3525
www.aarp.org
Email: member@aarp.org

Alliance for Aging Research

2021 K Street, NW, Suite 305
Washington, DC 20006
202-293-2856
www.agingresearch.org
Email: info@agingresearch.org

The Dana Alliance for Brain Initiatives

505 Fifth Avenue, Sixth Floor
New York, NY 10017
T: 212-401-1683
F: 212-593-7623
www.dana.org

National Alliance for the Mentally Ill

3803 N. Fairfax Drive, Suite 100
Arlington, VA 22203
703-524-7600 or
1-800-950-NAMI (6264)
www.nami.org

National Council on Aging

1901 L Street, NW, 4th Floor
Washington, DC 20036
202-479-1200
www.ncoa.org
Email: info@ncoa.org

National Institute on Aging

Building 31, Room 5C27
31 Center Drive, MSC 2292
Bethesda, MD 20892
1-800-222-2225
www.nih.gov/nia

Alzheimer's Disease

Alzheimer's Association

225 N. Michigan Avenue, 17th Floor
Chicago, IL 60601
1-800-272-3900
www.alz.org
Email: info@alz.org

Alzheimer's Disease Education & Referral Center: National Institute on Aging

P.O. Box 8250
Silver Spring, MD 20907
1-800-438-4380
www.nia.nih.gov/alzheimers
Email: Use the form at
www.nia.nih.gov/Alzheimers/
ContactUs.htm

Alzheimer Research Forum

www.alzforum.org
Email: Use the form at
www.alzforum.org/contact.asp

Caregiving

Children of Aging Parents

P.O. Box 167
Richboro, PA 18954
1-800-227-7294
www.caps4caregivers.org
Email: info@caps4caregivers.org

Eldercare Locator

1-800-677-1116
www.eldercare.gov
Email: eldercarelocator@n4a.org

Family Caregiver Alliance

180 Montgomery Street, Suite 900
San Francisco, CA 94104
415-434-3388 or 1-800-445-8106
www.caregiver.org
Email: info@caregiver.org

Chronic Pain

American Chronic Pain Association

P.O. Box 850
Rocklin, CA 95677
916-632-0922 or 1-800-533-3231
www.theacpa.org
Email: ACPA@pacbell.net

American Pain Foundation

201 N. Charles Street, Suite 710
Baltimore, MD 21201
1-888-615-PAIN (7246)
www.painfoundation.org
Email: info@painfoundation.org

Depression

National Alliance for Research on Schizophrenia & Depression (NARSAD)

60 Cutter Mill Road, Suite 404
Great Neck, NY 11021
516-829-0091 or 1-800-829-8289
www.narsad.org
Email: info@narsad.org

Depression & Bipolar Support Alliance

730 N. Franklin Street, Suite 501
Chicago, IL 60654
1-800-826-3632
www.ndmda.org
Email: info@dbsalliance.org

National Institute of Mental Health: Science Writing, Press, & Dissemination Branch

6001 Executive Boulevard
Room 8184, MSC 9663
Bethesda, MD 20892
301-443-4513 or 1-866-615-6464
www.nimh.nih.gov
Email: nimhinfo@nih.gov

Mental Health America

2000 N. Beauregard Street, 6th Floor
Alexandria, VA 22311
703-684-7722 or 1-800-969-6642
www.nmha.org
Email: infoctr@mentalhealthamerica.net

Depression and Suicide in Older Adults

National Institute of Mental Health Fact Sheet

www.nimh.nih.gov/health/publications/older-adults-depression-and-suicide-facts-fact-sheet/index.shtml

Information about Suicide

MedlinePlus, a health information resource from the National Library of Medicine

www.nlm.nih.gov/medlineplus/suicide.html

National Suicide Prevention Lifeline

1-800-273-TALK (8255)
Toll-free number available 24 hours a day, every day

Parkinson's Disease

American Parkinson's Disease Association

135 Parkinson Avenue
Staten Island, NY 10305
718-981-8001 or 1-800-223-2732
www.apdaparkinson.org
Email: apda@apdaparkinson.org

Parkinson's Action Network

1025 Vermont Ave., NW, Suite 1120
Washington, DC 20005
202-638-4101 or 1-800-850-4726
www.parkinsonsaction.org
Email: info@parkinsonsaction.org

The Parkinson's Disease Foundation

1359 Broadway, Suite 1509
New York, NY 10018
212-923-4700 or 1-800-457-6676
www.pdf.org
Email: info@pdf.org

The Parkinson's Institute

675 Almanor Avenue
Sunnyvale, CA 94085
408-734-2800 or 1-800-655-2273
www.thepi.org
Email: info2@thepi.org

Stroke

American Stroke Association

7272 Greenville Avenue
Dallas, TX 75231
1-888-478-7653 (4-STROKE)
www.strokeassociation.org
Email: strokeconnection@heart.org

National Institute of Neurological Disorders & Stroke (NIH): NIH Neurological Institute

P.O. Box 5801
Bethesda, MD 20824
301-496-5751 or 1-800-352-9424
TTY: 301-468-5981
www.ninds.nih.gov
Email: www.ninds.nih.gov/contact_us.htm

National Stroke Association

9707 E. Easter Lane, Building B
Centennial, CO 80112
1-800-787-6537 (1-800-STROKES)
www.stroke.org
Email: Info@stroke.org

NRTA: AARP's Educator Community

601 E Street, NW
Washington, DC 20049
(202) 434-2380
Fax (202) 434-6457
www.aarp.org/nrta

Vice President

Megan Stevens Hookey

NRTA Staff

Genaro (Gene) Ruiz

The Dana Alliance for Brain Initiatives

505 Fifth Avenue, 6th Floor
New York, NY 10017
(212) 223-4040
Fax (212) 593-7623
www.dana.org

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