WELCOME TO THE
IHSS TRAINING ACADEMY

ELECTIVE: MEDICAL IMPLICATIONS

This is the first elective course of the IHSS Training Academy. Participation in this one-day training is optional and has been designed as an enrichment course for IHSS social workers. It is not considered a part of the IHSS Training Academy's core curriculum and will be presented as "information only."

Learning Objectives

By the end of the course, the participants will have:

- A greater understanding of common medical conditions, diseases and procedures associated with IHSS consumers,
- Information that may help build a better rapport with consumers, families, and providers,
- Enhanced knowledge that may lead to a faster and more accurate process to better meet the needs of consumers,
- Additional information that will help identify areas needing follow-up, and
- Additional understanding that may aid in the referral of consumers to other needed resources.

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Anatomy and Functional Areas of the Brain

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Functional Areas of the Cerebellum

14. **Motor Functions**
    - Coordination of movement
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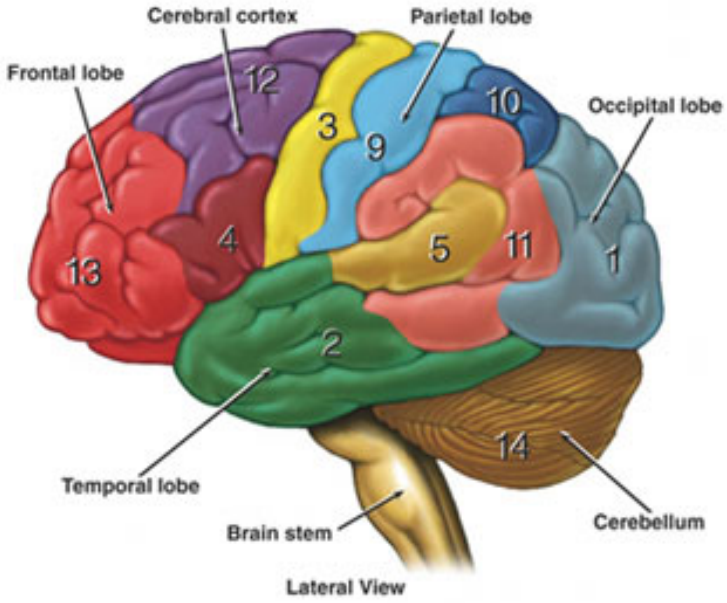

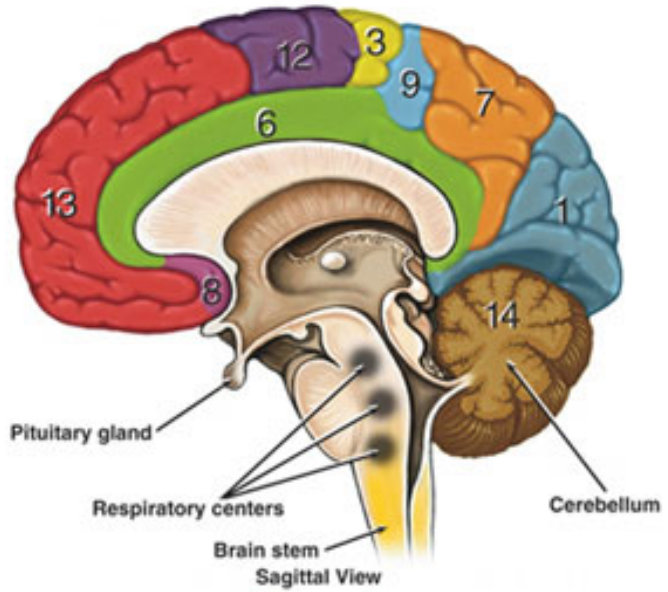

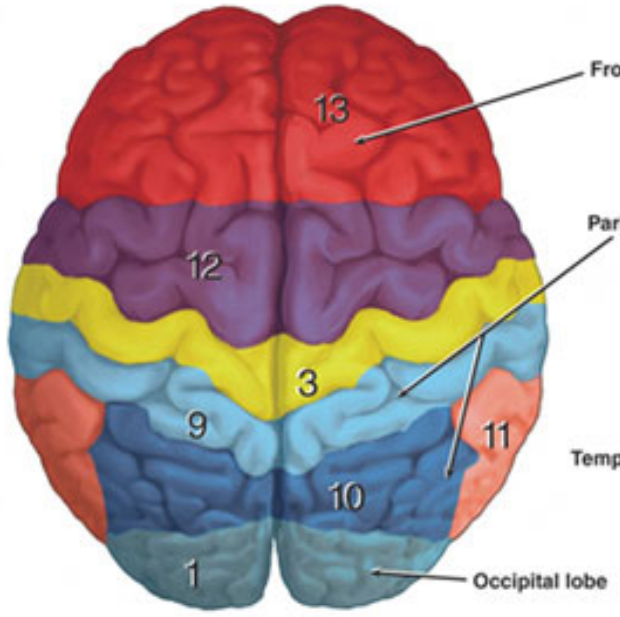

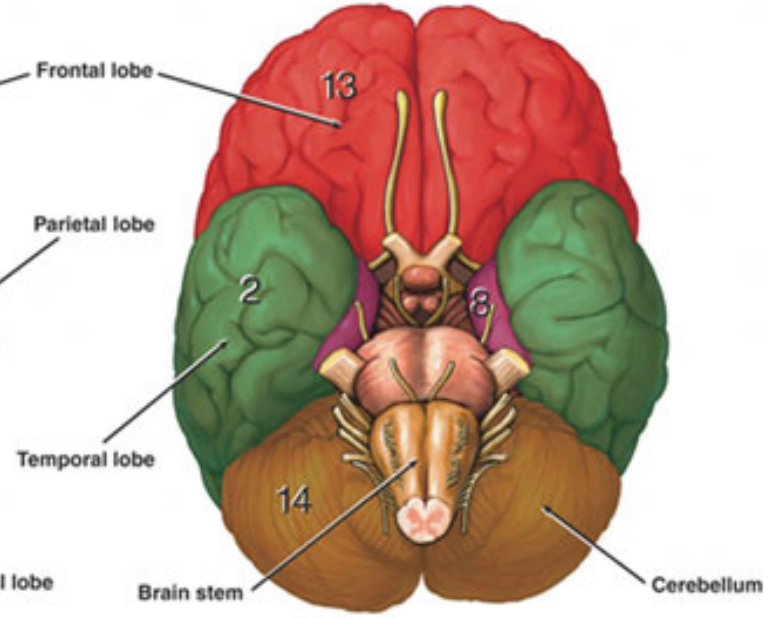

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Disease / Condition	Definition	Characteristics	Functional Considerations
Alzheimer's	Alzheimer's is the most common form of dementia among older people, which initially involves the parts of the brain that control thought, memory, and language.	• People with Alzheimer's live an average of eight years after diagnosis, although some people may live for as many as 20 years after being diagnosed. • To help people understand the changes that occur as the disease progresses, Alzheimer's is broken into stages: early, middle and late. • At the later stages, the person has lost most of their ability to function normally. • The development of symptoms will differ from person to person, and that each stage will gradually progress over a period of years.	• It is also usual for people with Alzheimer's to have "good days" and "bad days." For example, a person with early-stage Alzheimer's may not show any symptoms one day; the next day he or she may have trouble remembering his/her name or finding the milk in the refrigerator. • A person with Alzheimer's may engage in behaviors that put themselves at risk in the middle stage, but is unlikely to function well enough in the late stages to engage in such behaviors. • In the middle stage, it may take an extraordinarily long time to perform such tasks as bathing and shampooing a person with Alzheimer's because of their fear of water. • The person may be unable to select clothing and/or to dress self; may be resistant to change clothing.
Asthma	Asthma is a chronic disease of the respiratory system in which the airway occasionally constricts, becomes inflamed, and is lined with excessive amounts of mucus, often in response to one or more triggers.	• Inflammation makes the airways very sensitive, and they tend to react strongly to things that the patient is allergic to or find irritating. • When the airways react, they get narrower, and less air flows through to the lung tissue. • This causes symptoms like wheezing (a whistling sound when you breathe), coughing, chest tightness, and trouble breathing, especially at night and in the early morning. • Triggers include allergens such as animal dander, molds, dust and pollen, and irritants such as smoke, perfumes and cold air. Other triggers can be medications, foods, or chemicals. • Asthma cannot be cured, but most people with asthma can control it so that they have few and infrequent symptoms and can live active lives.	• If the disease is under control, most people will have few limitations. • During attacks, the patient may have difficulties with exertion and exercise. • Heavy cleaning may be appropriate to dustproof the bedroom. • It may be appropriate to make an exception to the Domestic Time per Task standard in order to keep the home dustproof and free from dust mites. • Having asthma alone may not be a basis for needing Domestic services; the consumer could wear a dust mask and perform needed laundry and house cleaning.

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Cerebral Palsy (CP)	CP is an umbrella term encompassing a group of non-progressive, non-contagious neurological disorders that cause physical disability in human development, specifically the human movement and posture.	It is caused by abnormalities inside the brain that disrupt the brain's ability to control movement and posture. In some cases of cerebral palsy, the cerebral motor cortex has not developed normally during fetal growth. In others, the damage is a result of injury to the brain either before, during, or after birth. In either case, the damage is not repairable and the **disabilities that result are permanent**. Patients with cerebral palsy exhibit a wide variety of **symptoms**, including: • lack of muscle coordination when performing voluntary movements (ataxia); • stiff or tight muscles and exaggerated reflexes (spasticity); • walking with one foot or leg dragging; • walking on the toes, a crouched gait, or a "scissored" gait; • variations in muscle tone, either too stiff or too floppy; • excessive drooling or difficulties swallowing or speaking; • shaking (tremor) or random involuntary movements; and • difficulty with precise motions, such as writing or buttoning a shirt. Some people with cerebral palsy also have other medical disorders, including mental retardation, seizures, impaired vision or hearing, and abnormal physical sensations or perceptions. Sixty-five (65%) to ninety (90%) of children with cerebral palsy live into their adult years.	• Functional abilities can be severe and wide ranged. • The symptoms of cerebral palsy differ in type and severity from one person to the next, and may even change in an individual over time so careful reassessment of function is important. • Consider whether the consumer has spasticity that justifies extra time for Domestic and/or Laundry (due to excessive spilling during meals). • If the consumer has difficulty swallowing, extra feeding time is probably justified. • Consumers with CP are likely to be depressed.

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Chronic Obstructive Pulmonary Disease (COPD)	COPD is a lung disease in which the lungs are damaged, making it hard to breathe. In COPD, the airways—the tubes that carry air in and out of your lungs—are partly obstructed, making it difficult to get air in and out. In the U.S., COPD includes emphysema and chronic bronchitis.	**Cigarette smoking is the most common cause of COPD**. Most people with COPD are smokers or former smokers. Breathing in other kinds of lung irritants, like pollution, dust, or chemicals, over a long period of time may also cause or contribute to COPD. The signs and symptoms of COPD include: • cough • sputum (mucus) production • shortness of breath, especially with exercise • wheezing (a whistling or squeaky sound when you breathe) • chest tightness Extreme weakness and loss of exercise tolerance is an outcome of COPD.	• Because symptoms usually don't appear until the later stages of COPD, most diagnosed patients will have functional limitations. • Functional limitations are most often related to exercise intolerance and shortness of breath. • Spacing activities and conserving energy are helpful in maximizing functional abilities. • The consumer will probably need to avoid exertion. For some consumers, even getting dressed may be too exerting. • If the consumer uses oxygen continuously, s/he may be able to reheat meals prepared in advance in a microwave. • The condition will become worse over time.
Cirrhosis	Cirrhosis is a consequence of chronic liver disease characterized by replacement of liver tissue by fibrotic scar tissue, leading to progressive loss of liver function. It is most commonly caused by alcoholism and hepatitis C, but has many other possible causes.	Many people with cirrhosis have no symptoms in the early stages of the disease. However, as scar tissue replaces healthy cells, liver function starts to fail and a person may experience the following symptoms: • exhaustion • fatigue • loss of appetite • nausea • weakness • weight loss • abdominal pain • spider-like blood vessels (spider angiomas) that develop on the skin Complications of cirrhosis are serious and caused by the buildup of toxins in the system and backup of blood flow through the vessels leading to the liver.	• People who have cirrhosis can have very low energy affecting all ADLs and IADLs. • Consumers who are experiencing low energy and fatigue may need a significant amount of IHSS services. • Consider need for referral for family issues related to condition, especially if still drinking. • If the consumer states they are having sticky, black stools, it could be an indication of bleeding. They should be strongly encouraged to see their MD immediately.

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Congestive Heart Failure (CHF)	CHF is a condition in which the heart cannot pump enough blood throughout the body. The heart cannot fill with enough blood or pump with enough force, or both.	Heart failure develops over time as the pumping action of the heart gets weaker. It can affect the right, the left, or both sides of the heart. Heart failure does not mean that the heart has stopped working or is about to stop working. It means that the heart is not able to pump blood the way that it should. The weakening of the heart's pumping ability causes: • Blood and fluid to "back up" into the lungs • The buildup of fluid in the feet, ankles, and legs • Tiredness and shortness of breath	• ADLs and IADLs can be greatly affected as the disease progresses. • Shortness of breath, fatigue, and edema can create low endurance. • Fatigue, weakness and shortness of breath may be the primary causes of dependency for IHSS services. • It is a progressive disease, so impairment is likely to worsen over time.
Coronary Artery Bypass Grafting (CABG)	CABG surgery creates new routes around narrowed and blocked arteries, allowing sufficient blood flow to deliver oxygen and nutrients to the heart muscle.	Arteries or veins from elsewhere in the patient's body are grafted from the aorta to the coronary arteries to bypass atherosclerotic narrowings and improve the blood supply to the coronary circulation supplying the myocardium (heart muscle). The **goals** of having CABG are to: • Improve quality of life and decrease angina and other symptoms of CAD, • Resume a more active lifestyle , • Improve the pumping action of the heart if it has been damaged by a heart attack, • Lower the chances of a heart attack (in some patients, such as those with diabetes), and • Improve chances of survival. Full recovery from traditional CABG may take **6 to 12 weeks** or more. Less recovery time is needed for nontraditional CABG.	• Post operatively limitations will be extensive. • Recovery should take 6-12 weeks, though is dependent upon pre-surgery conditions and complications. • Cognitive issues are common after heart-lung bypass, but should subside after several months. • A person who has had CABG may require an increase in services following surgery, but is likely to become more functional following full recovery from surgery. Therefore, it may be appropriate to authorize time-limited services.

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Diabetes	Diabetes is a metabolic disorder characterized by hyperglycemia (high blood sugar) and other signs.	Decrease or absence of insulin production in the body. • Type 1 – must take insulin shots • Type 2 – may be controlled with diet, oral medications or insulin shots o Heart disease o Stroke o Kidney disease o Neuropathies o Retinopathies o Gastroparesis o Urologic • Healthy diet and exercise are important to control the disease and prevention of complications.	• For most patients newly diagnosed, primary functional issues will be medication management, diet management and exercise. • Other limitations will relate to system failures. • Meal prep issues – Diabetic diet is healthy eating; unlikely to require extra prep time. o Good questions to ask may include: What is the diet? Does the consumer eat snacks? If a consumer cannot prepare meals (is a Rank 4 or 5), does s/he have a provider every day? If not, consider a referral to the Public Authority or other resource – perhaps Meals on Wheels can augment meal prep to meet the need. Restaurant Meals Allowance may also be an alternative. • Bathing, oral hygiene and grooming – o Drying skin, especially between the toes, and application of lotion to the feet, but not between the toes, is important. • If the consumer has open, non-healing sores, a doctor may want to order Paramedical care. • Urination – The consumer may have frequent urination requiring an increase in Bowel and Bladder care. If the consumer cannot get to the toilet/urinal/commode fast enough, there may be the need to make an exception to Domestic and Laundry. • Exercise is important for controlling blood sugar levels. • Common Paramedical services – o Glucometer blood testing and charting. o Insulin injection. o Filling syringes for consumer to inject. • Consumers who are experiencing complications may require frequent visits to primary physicians and/or specialists.

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Fibromyalgia	Fibromyalgia is a chronic syndrome (constellation of signs and symptoms) characterized by diffuse or specific muscle, joint, or bone pain, fatigue, and a wide range of other symptoms.	The defining symptoms of Fibromyalgia are chronic, widespread pain and tenderness to light touch, and usually moderate to severe fatigue. In addition to pain and fatigue, people who have Fibromyalgia may experience: o sleep disturbances, o morning stiffness, o headaches, o irritable bowel syndrome, o painful menstrual periods, o numbness or tingling of the extremities, o restless legs syndrome, o temperature sensitivity, o cognitive and memory problems (sometimes referred to as "fibro fog"), or o a variety of other symptoms. Fibromyalgia is often referred to as an **"invisible" illness** or disability due to the fact that generally there are no outward indications of the illness or its resulting disabilities.	• Fibromyalgia can affect every aspect of a person's life due to pervasive and persistent chronic pain. • Expect that the consumer may have cycles of good days and bad days. • Individuals suffering from invisible illnesses in general often face disbelief or accusations of malingering or laziness from others that are unfamiliar with the syndrome and therefore may be defensive during the assessment. • Fibromyalgia is a chronic condition, but is not progressive.
Kidney Failure	Renal failure or kidney failure is the condition in which the kidneys fail to function adequately. This occurs due to a decrease in the glomerular filtration rate which results in an elevated serum creatinine.	Causes of kidney failure include: o Diabetic Nephropathy o High Blood Pressure o Glomerular Diseases o Inherited and Congenital Kidney Diseases o Poisons and trauma o Over-the-counter medicines • Primary symptoms due to buildup of wastes in the blood system and absence of hormones normally made in the healthy kidney. • There is no cure. • Treatments consist of hemodialysis, peritoneal dialysis or transplant. • Diet is important in both preventing or furthering disease and during treatment.	• These are primarily related to anemia, fatigue, diet, depression and other systemic issues related to treatment and disease state. • What is the diet? There may be a basis to exceed HTGs for Meal Prep to prepare the diet. • Does the consumer need transportation to hemodialysis center? Both ways? This would be medical accompaniment; wait time would not be authorized. Time would not be authorized if the dialysis center provides transportation, or public transportation is available. • Can the consumer manage all aspects of Peritoneal dialysis if this is the treatment? • Does the consumer need creams applied to treat itchy skin? • If the consumer is depressed, refer to the appropriate local resource.

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Lupus	Lupus is a chronic autoimmune disease that is potentially debilitating and sometimes fatal as the immune system attacks the body's cells and tissue, resulting in inflammation and tissue damage. There is no cure for Lupus.	• Lupus is characterized by periods of illness, called flares, and periods of wellness, or remission. • Understanding how to prevent flares and how to treat them when they do occur helps people with lupus maintain better health. • Intense research is underway, and scientists funded by the NIH are continuing to make great strides in understanding the disease, which may ultimately lead to a cure. • This can damage many parts of the body such as the: o Joints o Skin o Kidneys o Heart o Lungs o Blood vessels o Brain	• Needs are variable depending upon severity of illness and type of Lupus. • Needs will intensify during periods of flares. • Determine the frequency and duration of flare and functional capacity during flare and the functional capacity during remission. • Medication therapy may negatively affect functionality, especially if on high dose long-term Corticosteroids. • Medical information may be necessary from several medical specialists to get a complete picture of the consumer's impairments. • Anticipate there may be frequent medical appointments to several doctors. • Determine how lupus affects the consumer (fatigue, painful or swollen joints, unexplained fever, skin rashes, and kidney problems, all of the above, other).
Multiple Sclerosis (MS)	MS is a chronic, inflammatory, demyelinating disease that affects the central nervous system.	MS can cause a variety of symptoms, including changes in sensation, visual problems, muscle weakness, depression, difficulties with coordination and speech, severe fatigue, cognitive impairment, problems with balance, overheating, and pain. MS will cause impaired mobility and disability in more severe cases. Clinically categorized as: • Relapsing-remitting (RR) • Chronic progressive MS o Primary-progressive (PP) o Secondary-progressive (SP) o Progressive-relapsing (PR) • Benign • Malignant	• Functional implications are dependent upon the type of MS and progression. • The consumer may have severe functional limitations or minor impacts. • Once the progression has stopped, function can improve. • Many people with MS have cycles of impairment and relief which should be considered in the assessment process. • If MS is progressive, functioning may deteriorate over time. • Symptoms of MS are wide ranging including bowel, bladder, muscle, vision, cognitive and emotional function. • Tolerance to heat and fatigue is nearly always a problem.

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Osteoarthritis	Osteoarthritis is the most common type of arthritis, and is seen especially among older people. Sometimes it is called degenerative joint disease or osteoarthrosis. People with osteoarthritis often have joint pain and reduced motion.	Osteoarthritis is a joint disease that mostly affects cartilage. The top layer of cartilage breaks down and wears away. This allows bones under the cartilage to rub together. The rubbing causes pain, swelling, and loss of motion of the joint. Over time, the joint may lose its normal shape. Also, bone spurs may grow on the edges of the joint. Bits of bone or cartilage can break off and float inside the joint space, which causes more pain and damage.	• Limitations will be based on location and severity of disease. • If in the hands, fine motor control and function will be greatly diminished. • If in the joints of the back and legs, the consumer will have difficulties with bending, stooping and ambulation. • Exercise (without overexerting) is one of the best treatments for osteoarthritis. • Weight control is important. • Consumers, whose pain is not controlled by medications, may have an increased need for IHSS.
Osteoporosis	Osteoporosis is a disease marked by reduced bone strength leading to an increased risk of fractures or broken bones.	• Is often called a **"silent disease"** because it usually progresses without any symptoms until a fracture occurs. • Can happen to any bones, but is most common in the hip, wrist, and in the spine. Also called the vertebrae. • Osteoporosis in the vertebrae will result in: o Sloping shoulders o Curve in the back o Height loss o Back pain o Hunched posture o Protruding abdomen • More often seen in women with a greater incident after menopause, though 1 in 4 men over the age of 50 will suffer a fracture because of osteoporosis.	• After fracture, functional limitations will be based on location of the fracture. • A person with known disease should take precautions to avoid falls. • If osteoporosis impacts posture, the person's balance is likely to be impaired, making him/her at greater risk for falls. • A person with osteoporosis may experience chronic pain, particularly back pain and muscle spasms; regular exercise can help. • People with osteoporosis should not bend forward, twist or lift heavy objects.

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Parkinson's Disease (PD)	PD is a degenerative disorder of the central nervous system that often impairs the sufferer's motor skills and speech.	• The **four primary symptoms** of PD are:
		  o tremor, or trembling in hands, arms, legs, jaw, and face
		  o rigidity, or stiffness of the limbs and trunk
		  o bradykinesia, or slowness of movement
		  o postural instability, or impaired balance and coordination
		• **Other symptoms** may include:
		  o depression and other emotional changes
		  o difficulty in swallowing, chewing, and speaking
		  o urinary problems or constipation
		  o skin problems
		  o sleep disruptions
		• PD usually affects people over the age of 50.
		• Early symptoms of PD are subtle and occur gradually.
		• In some people the disease progresses more quickly than in others.
		• PD is both chronic, meaning it persists over a long period of time, and progressive, meaning its symptoms grow worse over time.
		• It is not contagious.
		• Many researchers now believe that PD results from a combination of genetic susceptibility and exposure to one or more environmental factors that trigger the disease.
			• In the early stages watch for subtle cognitive losses that could effect decision making capabilities.
			• Due to slow progression people may overestimate abilities.
			• Mobility and cognition can be severe at the end stages of the disease.
			• Functional impairments are likely to worsen as the disease progresses.
			• Consider exception to Domestic standard because of spilling and missing the toilet when a man urinates.
			• If feeding is authorized, the risk of choking and difficulty in swallowing should be considered.
			• Additional time for feeding, dressing, and grooming may be required due to tremors and stiffness, possibly warranting an exception.
			• The consumer may look flat without facial expressions. This does not mean they do not understand the conversation.

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Peripheral Arterial Disease (PAD)	Fatty material called plaque builds up on the inside walls of the arteries that carry blood from the heart to the head, internal organs, and limbs. PAD is also known as atherosclerotic peripheral arterial disease.	• **Atherosclerosis** can affect arteries anywhere in the body, including the arteries that carry blood to the heart and brain. • **Peripheral Arterial Disease (PAD) –** affects the arteries that supply blood to the limbs, especially the legs. PAD can impair physical health and diminish the ability to walk. • **Chronic Critical Limb Ischemia (CLI) –** in the advanced stages of PAD, blood flow to one or both legs can be completely or mostly blocked. CLI may lead to painful leg or **foot sores**, and it could eventually lead to **gangrene**. If this condition is left untreated, the foot or leg may need to be **amputated**. Major risk factors for developing PAD include: • **Smoking**. Smoking is more closely related to developing PAD than any other risk factor. • **Diabetes**. • **Other diseases and conditions** such as: o Kidney disease o High blood pressure or a family history of it o A high cholesterol level or a family history of it o Heart disease or a family history of it • **A family history of stroke** • **Age** – risk increases with age	• Symptoms such as claudication, pain and sores can make walking a very difficult issue for these patients. • Amputation can create many functional limitations. • Leg pain and cramping may impede functional ability. • The amount of walking or standing the consumer can do before pain occurs will give an idea of stamina. • Supervised exercise may improve functioning – this should be doctor directed. • Paramedical services for wound care may be indicated.
Rheumatoid Arthritis (RA)	RA is a chronic, inflammatory autoimmune disorder that causes the immune system to attack the joints. It is a disabling and painful inflammatory condition, which can lead to substantial loss of mobility due to pain and joint destruction. RA is a systemic disease, often affecting extra-articular tissues throughout the body including the skin, blood vessels, heart, lungs, and muscles.	• It has several **special features** that make it **different from other kinds of arthritis**. Characterized by: o Tender, warm, swollen joints o Symmetrical pattern of affected joints o Joint inflammation often affecting the wrist and finger joints closest to the hand o Joint inflammation sometimes affecting other joints, including the neck, shoulders, elbows, hips, knees, ankles, and feet o Fatigue, occasional fevers, a general sense of not feeling well o Pain and stiffness lasting for more than 30 minutes in the morning or after a long rest o Symptoms that last for many years o Variability of symptoms among people with the disease • Characterized by periods of flares and remissions. • About 60% of RA patients are unable to work 10 years after the onset of their disease.	• Movement and function is greatly affected by diseased and deformed joints. • Not all consumers with RA will require IHSS. • Joints are very painful and the consumer may be unable to move or grasp normally. • Systemic effects, when present, can be debilitating and result in a loss of endurance and function. • It is good to find out: How long do flares last? How well does the consumer function when there is a flare? When they are In remission? • It may be appropriate to authorize assistance in exercise (assistive walking if needed and ROM exercises). • May need to have splints put on and removed; may benefit from assistive devices and grab bars. • Consumers who have had joint replacement surgery may require a temporary increase in IHSS. A time-limited authorization with a reassessment should be considered.

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Scleroderma	Scleroderma is a rare, chronic disease characterized by excessive deposits of collagen in the skin or other organs. The localized type of the disease tends not to be fatal. Diffuse scleroderma or systemic sclerosis, the generalized type of the disease, can be fatal as a result of heart, kidney, lung or intestinal damage.	Scleroderma is called both a **rheumatic disease** and a **connective tissue disease**. • The term rheumatic disease refers to a group of conditions characterized by inflammation and/or pain in the muscles, joints, or fibrous tissue. • A connective tissue disease is one that affects tissues such as skin, tendons, and cartilage. **Side effects include:** o Raynaud's Phenomenon (Cold sensitivity of fingers with red, white, and blue discoloration) o Stiff, painful joints Skin problems o Dry mouth and dental problems o Gastrointestinal (GI) problems o Lung damage Heart problems o Kidney problems o Cosmetic problems	Expect possible effect in the following areas: • Appearance and self-esteem • Self care • Family relationships • Pregnancy and childbearing • Sexual relations • Tight, hard connective tissue in the hands can impair functioning • Energy level is often significantly impaired • Because this is a system disease the consumer may not look as sick as they are feeling.
Stroke	A stroke, or "brain attack," occurs when blood circulation to the brain fails. Brain cells can die from decreased blood flow and the resulting lack of oxygen. Also called a cerebrovascular accident or CVA.	• Caused either by bleeding in the brain (hemorrhage) or the interruption of blood to the brain (ischemic) • TIA (transient ischemic attack) may be a warning sign to stoke. • Risk factors include: Diabetes, high blood pressure, cigarette smoking, cardiovascular disease. • Disabilities related to stroke vary depending upon the severity of the "attack".	Functional needs will be related to disabilities common after stroke such as: • Paralysis or Problems Controlling Movement (Motor Control). • Bowel or Bladder Control. • Sensory Disturbances Including Pain. • Problems Using or Understanding Language (Aphasia). • Problems with Thinking and Memory. • Emotional disturbances. • If stroke is recent, functioning may improve with therapy. • Dexterity may be so poor and/or the consumer may have incontinence to the point that extra Domestic and Related may be justifiable. • ROM exercises and other activities are frequently recommended by a physical therapist and/or occupational therapist; performance of them most likely it will be appropriate as Rubbing Skin and Repositioning (not Paramedical). • Consumer should be encouraged to be as independent as possible while not over-taxing him/her. • Consumer may be unable to sense temperature so that would be an important part of the task of Bathing, Oral Hygiene and Grooming. • Adaptive equipment and DMEs could make the consumer safer and more independent. • Consumer is probably at increased risk of decubitis ulcers so frequent repositioning may be appropriate if s/he cannot move independently or reminding if the consumer can move independently. • Consider a service plan that gives provider some respite to prevent/minimize caregiver burnout. o Encourage provider to keep to a routine.

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QUICK FACTS SHEET

Disease / Condition	Definition	Characteristics	Functional Considerations
Traumatic Brain Injury (TBI)	Traumatic injuries to the brain, also called intracranial injury, or simply head injury, occurs when a sudden trauma causes brain damage.	The damage can be: • **focal** - confined to one area of the brain - or • **diffuse** - involving more than one area of the brain. TBI can result from: o closed head injury - occurs when the head suddenly and violently hits an object but the object does not break through the skull o penetrating head injury - occurs when an object pierces the skull and enters brain tissue A TBI can cause problems with arousal, consciousness, awareness, alertness, and responsiveness. Disabilities resulting from a TBI depend upon the severity of the injury, the location of the injury, and the age and general health of the patient. Some common disabilities include problems with cognition (thinking, memory, and reasoning), sensory processing (sight, hearing, touch, taste, and smell), communication (expression and understanding), and behavior or mental health (depression, anxiety, personality changes, aggression, acting out, and social inappropriateness).	• Functional limitations will be dependent upon the type and location of the injury. • Behavioral issues can be the most challenging when working with these patients. o Minimize distractions during the assessment interview. o If the consumer has outbursts, it is important to remain calm; validate the person's emotions. o Don't challenge or confront; rather negotiate. • When developing a plan, include respite for the provider. • Encourage the provider to maintain a routine as much as feasible.
Falls		Falls don't "just happen," and people don't fall because they get older. Often, more than one underlying cause or risk factor is involved in a fall. As the number of risk factors rises, so does the risk of falling. o Many falls are linked to a person's physical condition or a medical problem, such as a chronic disease. o Other causes could be safety hazards in the person's home or community environment.	• Physical activity to the level of capacity, such as doing housework and going shopping, reduces the risk of falling by maintaining muscular strength, flexibility, endurance and bone density. • Clutter, especially on the floors, increases the risk of falling. Consider the appropriateness of Heavy Cleaning if clutter poses a risk. • Refer for the installation of grab bars in the bathroom (by the toilet and in the shower and by the tub), banisters by stairs (all bars should be secured to wall studs). • Encourage the use of a cane or walker, if the consumer has one, particularly when going outside. • If the consumer does not have assistive devices and is experiencing falls suggest that they talk to their physician about getting a prescription for these items. • Consumers who are experiencing frequent falls may require assistance with ambulation. • Suggest the removal of throw rugs, or securing all carpets and rugs to the floor or stairs. • Refer for a personal emergency response system such as Lifeline, if appropriate.

The information is presented to inform IHSS social workers about medical conditions. It is not meant to contradict any information the consumer may receive from their personal physician. **All IHSS assessments should be individualized and are not diagnosis specific.**

Welcome to the In-Home Supportive Services Training Academy

A partnership between…

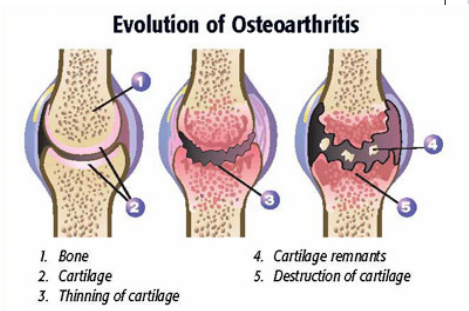
- California Department of Social Services
- California Welfare Directors' Association
- California State University, Sacramento
  - College of Continuing Education
  - Institute for Social Research

Overview of *Medical Implications*

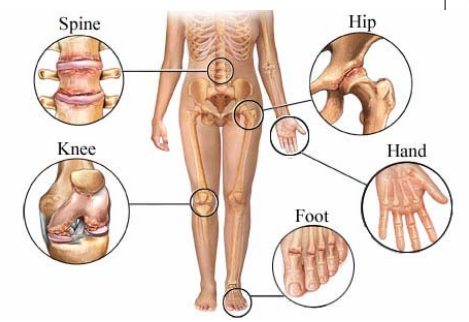
- Information about Conditions, Diseases and Procedures
- Medication Management
- Chronic Pain
- Falls
- Use of Training Resources
- Caregiver Issues

What do you KNOW????

Osteoarthritis



Osteoarthritis

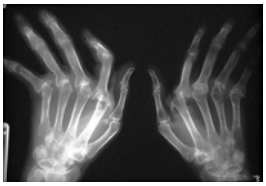


Osteoarthritis

Typical clinical presentation

Rheumatoid Arthritis

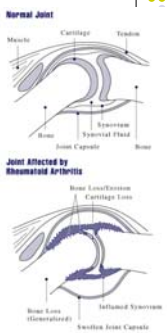
Characteristic hand joint involvement



Rheumatoid Arthritis

Characteristics

- Autoimmune
- Flares and remissions
- Fatigue, occasional fevers, a general sense of not feeling well
- Pain and stiffness lasting for more than 30 minutes in the morning or after a long rest



Arthritis

Osteoarthritis

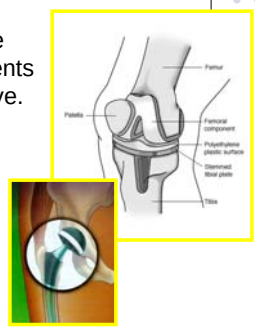
- Wear and tear damage
- Slow degeneration
- Disease of the elderly
- Gradual onset of symptoms
- Only joints
- Better in a.m. and less function as day progresses

Rheumatoid

- Autoimmune disease
- Systemic effects
- All ages including children
- Flares and remissions
- Variability of symptoms
- Better after movement

Joint Replacement

- Only used after more conservative treatments are no longer effective.
- Diseases: Arthritis, Trauma, Infection, Necrosis.



Joint Replacement

Functional Considerations

- Dressing changes
- Bathing restrictions – usually 7-10 days after surgery
- Variable function and pain
- Bacterial infection caution
- Time limited authorization
- Constipation

Joint Replacement

Functional Considerations

Hip Replacement

- Weight bearing usually by 8 weeks – may still need some help
- Return to normal activities usually 3-6 months
- No crossing legs for 6 weeks
- Many do's and don'ts

Knee Replacement

- 6-8 weeks return to normal activities
- May take 6-12 months for full recovery
- Avoid heavy lifting

Osteoporosis

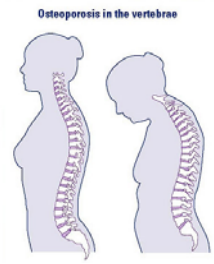
- Reduced bone strength leads to an increased risk of fractures or broken bones.
- Most often break bones in the hip, spine, and wrist.
- Is often called a **"silent disease"** because it usually progresses without any symptoms until a fracture occurs.
- More often seen in women with a greater incident after menopause.
- Osteoporosis is **different** from osteoarthritis.

Osteoporosis

- Cannot be cured
- Prevention:
  - Calcium intake
  - Vitamin D intake
  - Weight bearing exercise
- New medications may help

Osteoporosis in the vertebrae will result in:

- Sloping shoulders
- Curve in the back
- Height loss
- Back pain
- Hunched posture
- Protruding abdomen



Autoimmune Diseases

- Immune cells mistake the body's own cells as invaders and attack them.
- Can affect almost any part of the body and can affect many at once.
- Not contagious.
- Genetic predisposition with possible environmental trigger.
- Can be hard to diagnose.
- The consumer may not outwardly look ill.

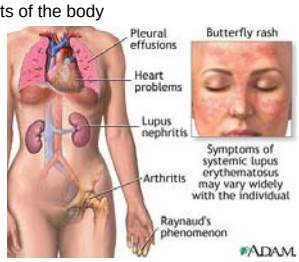
Autoimmune Diseases

- Lupus
- Scleroderma
- Multiple Sclerosis
- Rheumatoid Arthritis
- Type 1 Diabetes

Lupus

Characteristics

- Inflammation and tissue damage
- Flares and remissions
- Can damage many parts of the body such as the:
  - Joints
  - Skin
  - Kidneys
  - Heart
  - Lungs
  - Blood vessels
  - Brain



Lupus

- Most common symptoms of lupus are:
  - Pain or swelling in joints
  - Muscle pain
  - Fever with no known cause
  - Red rashes, most often on the face
  - Chest pain when taking a deep breath
  - Hair loss
  - Pale or purple fingers or toes
  - Sensitivity to the sun
  - Swelling in legs or around eyes
  - Mouth ulcers
  - Swollen glands
  - Feeling very tired

Scleroderma

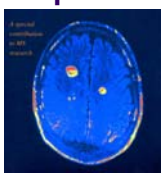
- Effects both joints and connective tissue
- Can be localized or systemic
- Set of complications includes:
  - Calcium deposits in connective tissue
  - Raynaud's phenomenon
  - Esophageal dysfunction
  - Thickening of the skin
  - Red spots from swelling of blood vessels

Scleroderma

Other Characteristics

- Skin thickening can prevent movement in hands, opening mouth
- Often tired, lose appetite and weight, and have joint swelling and/or pain
- Dental problems – loose teeth, decay
- Swallowing difficulties, reflux, diarrhea, constipation
- Poor absorption of nutrients
- Shortness of breath, swelling in the feet
- Cardiac and kidney crisis – both causing fatigue and poor endurance

Multiple Sclerosis (MS)



- **Inflammatory, demyelinating disease affecting the central nervous system (CNS)**

Multiple Sclerosis

Common Symptoms

Vision disturbances	Poor muscle coordination
Muscle weakness	Tremor
Spasticity	Vertigo
Fatigue	Bladder dysfunction
Numbness and tingling	Bowel dysfunction
Heat sensitivity	Depression
Pain	Euphoria
Speech disturbances	Sexual dysfunction
Cognitive abnormalities	

Hypertension

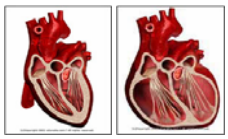
Categories for Blood Pressure Levels in Adults (in mmHg, millimeters of mercury)[a]

Category	Systolic (top number)	Diastolic (bottom number)
Normal	Less than 120	Less than 80
Prehypertension	120–139	80–89
High blood pressure		
Stage 1	140–159	90–99
Stage 2	160 or higher	100 or higher

[a] For adults 18 and older who are not on medicine for high blood pressure; are not having a short-term serious illness; and do not have other conditions, such as diabetes and kidney disease.

Congestive Heart Failure (CHF)

- Ineffective pumping action
- Leading causes:
  - Heart damage from heart attack
  - Hypertension
  - Diabetes
  - Cardiomyopathy
  - Diseases of the heart valves
  - Abnormal heartbeats or arrhythmias
  - Congenital heart defects



CHF

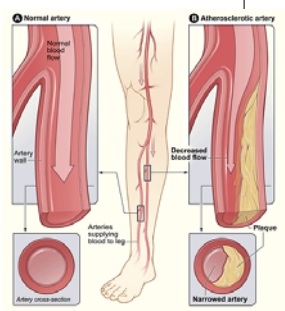
Functional Considerations

The weakening of the heart's pumping ability causes:

- Shortness of breath or difficulty breathing
- Feeling tired
- Swelling in the ankles, feet, legs, and sometimes the abdomen

Peripheral Arterial Disease (PAD)

Also known as atherosclerotic peripheral arterial disease.



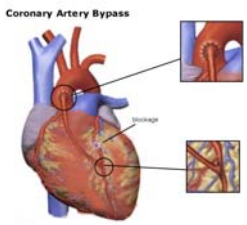
PAD

Advanced stages of PAD:

- Chronic critical limb ischemia (CLI).
  - Legs do not receive the oxygen or nutrition needed for cellular or skin growth and repair.
  - May lead to painful legs or **foot sores**.
  - Could eventually lead to **gangrene**.
  - If left untreated, the foot or leg may need to be **amputated**.

Coronary Artery Bypass Grafting (CABG)

CABG surgery creates new routes around narrowed and blocked arteries, allowing sufficient blood flow to deliver oxygen and nutrients to the heart muscle.

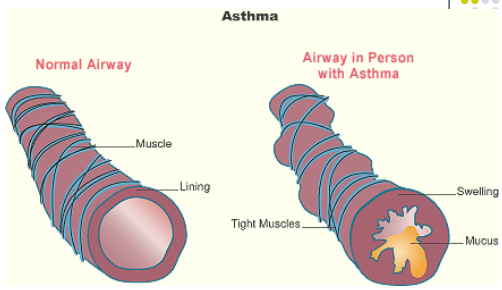


CABG

Functional Considerations

- Full recovery may take 6-12 weeks or more
- May experience:
  - Fatigue (tiredness)
  - Mood swings
  - Depression
  - Difficulty sleeping
  - Loss of appetite
  - Pain at incision site – chest and leg
  - Constipation

Asthma



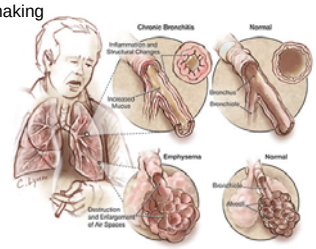
Asthma

Functional Considerations

- Some medications can cause irritability, restlessness, sleeping difficulties, heart palpitations.
- Limiting offending allergens can help control condition and improve functional ability.

Chronic Obstructive Pulmonary Disease (COPD)

- Lungs are damaged making it hard to breathe. The airways are partly obstructed, making it **difficult to get air in and out.**
- May include emphysema and/or chronic bronchitis.



COPD

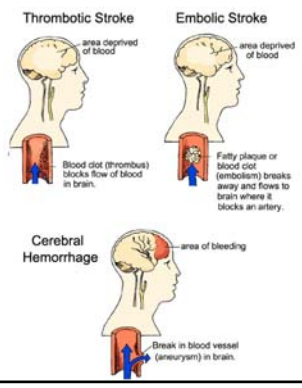
Functional Considerations

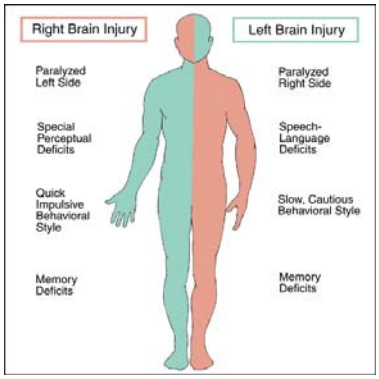
- Most all diagnosed patients will have functional limitations related to exercise intolerance.
- Spacing activities and conserving energy are helpful in maximizing functional abilities.
  - Even getting dressed may be too exerting for the consumer to perform.
- If the consumer uses oxygen, s/he may be able to reheat meals prepared in advance in a microwave.
- The condition often will become worse over time.

Stroke

- Third leading cause of death in the United States.
- Causes more serious long-term disabilities than any other disease.
- Nearly three-quarters of all strokes occur in people over the age of 65.
- Risk of having a stroke more than doubles each decade after the age of 55.

Types of Stroke





Stroke

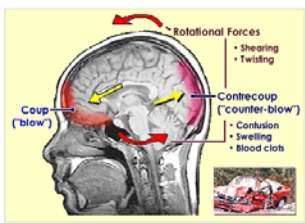
Functional Considerations

- Paralysis or problems controlling movement (motor control)
- Bowel or bladder control
- Sensory disturbances including pain
- Problems using or understanding language (Aphasia)
- Problems with thinking and memory
- Emotional disturbances

40% of stroke survivors suffer serious falls within a year after their strokes.

Traumatic Brain Injury (TBI)

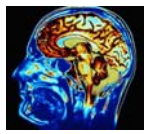
- Occurs when a sudden trauma causes damage to the brain
- Some symptoms are evident immediately, while others do not surface until several days or weeks after the injury.
- Often causes problems with consciousness, awareness and alertness



TBI

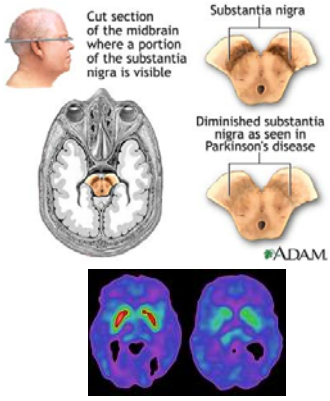
Functional Considerations

- Dependent upon the **type** and **location** of the injury.
- Encourage the provider to maintain a routine as much as feasible.
- Behavioral issues can be the most challenging.
- When developing a plan, include respite for the provider.



Parkinson's

- Disease occurs when nerve cells, or neurons, in an area of the brain known as the **substantia nigra,** die or become impaired.
- Degenerative
- Chronic and progressive



Parkinson's

- Four primary symptoms:
  - tremor, or trembling in hands, arms, legs, jaw, and face
  - rigidity, or stiffness of the limbs and trunk
  - bradykinesia, or slowness of movement
  - postural instability, or impaired balance and coordination

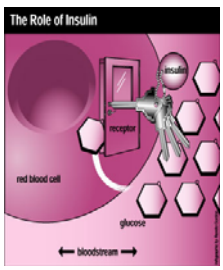
Parkinson's

Functional Considerations

- With good medication control, limitations may be minor in the beginning stages of the disease.
- Due to slow progression, people may overestimate abilities.
- Mobility and cognition can be severe at the end stages of the disease.
- Bowel, bladder, skin, swallowing, sleeping, cognitive abilities and talking can all be greatly affected.

Diabetes

- Chronic disease in which the pancreas produces too little or no insulin, impairing the body's ability to turn sugar into usable energy.
- All complications are directly due to high glucose levels in the system.
- Type 1 vs. Type 2



Diabetes

- Neuropathies – a lack of sensation.
- Decrease in blood flow.
- Increase potential for ulcers and gangrene.
- Proper foot care is very important.

Diabetes

Signs and Symptoms

Hyperglycemia

- Excessive: Hunger, thirst and urination.
- Blurred vision
- Fatigue
- Weight loss
- Poor wound healing (cuts, scrapes, etc.)
- Dry mouth
- Dry or itchy skin
- Impotence (male)
- Recurrent infections

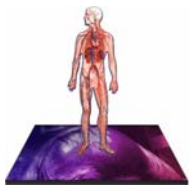
Hypoglycemia

- Hunger
- Nervousness and shakiness
- Perspiration
- Dizziness or light-headedness
- Sleepiness
- Confusion
- Difficulty speaking
- Feeling anxious or weak

Diabetes

Functional Considerations

- Primary functional issues at first will be medication management, diet management and exercise.
- Other limitations will relate to system failures.
- Common complications:
  - Heart disease
  - Stroke
  - Kidney disease
  - Neuropathies
  - Retinopathies
  - Gastroparesis
  - Sexual
  - Urologic



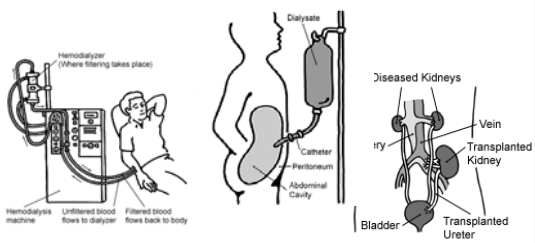
Kidney Failure

- Kidneys fail to function adequately
- Causes:
  - Diabetic nephropathy
  - High blood pressure
  - Kidney diseases
  - Inherited and congenital kidney diseases
  - Poisons and trauma
  - Over-the-counter medicines
- Buildup of wastes in the blood system
- Absence of hormones normally made in the healthy kidney

Kidney Failure

- If the kidneys stop working completely, the body fills with extra water and waste products. This condition is called **uremia**.
- Untreated uremia may lead to **seizures or coma** and will ultimately result in death.
- If the kidneys stop working completely, they will need to undergo **dialysis or kidney transplantation**.

Kidney Failure

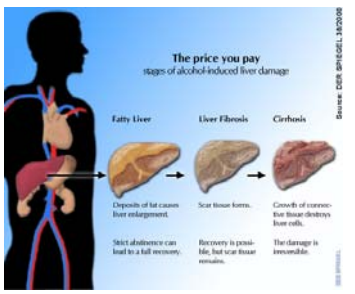


Cirrhosis

A consequence of chronic liver disease characterized by replacement of liver tissue by fibrotic scar tissue, leading to progressive loss of liver functions.

Cirrhosis

In the U.S., chronic alcoholism and hepatitis C are the most common causes.



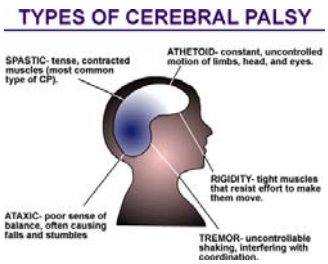
Cirrhosis

Characteristics

- Edema in legs and abdomen
- Bruising and bleeding
- Jaundice
- Itching
- Gallstones
- Toxins in the blood or brain
- Sensitivity to medication
- Impaired blood flow to liver
- Varices
- Insulin resistance and Type 2 diabetes
- Liver cancer
- Problems in other organs

Cerebral Palsy

- abnormalities inside the brain that disrupt the brain's ability to control movement and posture

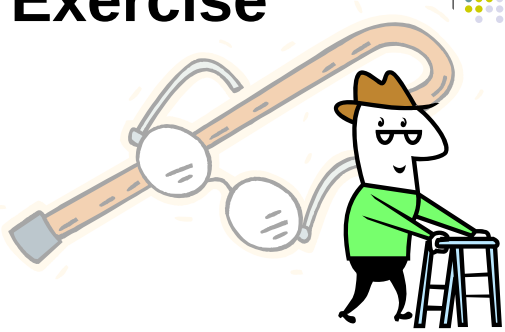


Cerebral Palsy

Functional Considerations

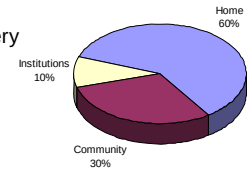
- Impairment varies widely
- Impairment is usually stable
- Spasticity can be a huge barrier
- If the consumer has difficulty swallowing, extra feeding time is probably justified
- Depression common
- Medication side effects

Exercise



Falls

- Falls are the leading cause of fatal and nonfatal injuries to older people in the U.S.
- Each year, more than 11 million people older than 65 fall - one of every three senior citizens.



Falls

Personal risk factors to falling:

- Muscle weakness
- Balance and gait
- Drop in BP upon standing
- Slow reflexes
- Foot problems
- Sensory problems
- Eye sight
- Confusion
- Medications
- Environmental obstacles
- Alcohol

Falls

Medicines that may increase risk:

- Blood pressure pills
- Heart medicines
- Diuretics (water pills)
- Muscle relaxants
- Sleeping pills

Falls in the Home

- Remove throw rugs
- Free paths of cords and furniture
- Wear sturdy shoes
- Hand rails – stairs and in the bathroom
- Good lighting
- Utilize technology
  - Medical Alert systems
  - Portable Phone

Alzheimer's

- The most common form of dementia
- Three stages – early, middle and late
- Progressive nature is variable

Caregiving

caregiving spouses between the ages of 66 and 96 who experience mental or emotional strain, have a 63% higher risk of dying than non-caregiving spouses

Caregiver Issues

- **Less likely to care for self**
  - sleep deprivation
  - poor eating habits
  - failure to exercise
  - failure to stay in bed when ill
  - postponement of or failure to make medical appointments

Caregiver Issues

- **Greater risk for health problems**
  - colds and flu, and chronic diseases such as heart problems, diabetes, and cancer
  - increased risk for excessive use of alcohol, tobacco and other drugs and for depression.

Medication Management

Risk Factors

Multiple Providers

Multiple medical providers

+

More than one pharmacy

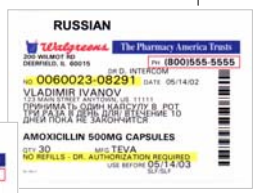
=

↑ risk for medication mismanagement or adverse drug reactions

Risk Factors

Socioeconomic Factors

- Other socioeconomic factors



Risk Factors

Cognitive Changes

- Dementia or mental health issues.
- Drug toxicity, adverse side effects or medication interactions due to use of multiple medications can cause confusion, memory problems.
- Most common reason cited: “forgetfulness”.

Other Risk Factors

- Multiple IHSS providers
- Multiple medications
- Complex dosage schedules
- Living alone
- Sensory deficits
- Recent move or relocation
- Recent discharge from the hospital

Adverse Drug Reactions

- Two medications - 6% risk for ADR
- Five medications - 50% risk for ADR
- ≥ Eight medications – **100% risk** for ADR

Adverse Drug Reactions

Signs and Symptoms

Confusion	Forgetfulness	Hallucinations
Lethargy	Unsteady Gait	Falls or accidents
Dizziness	Lightheadedness	Fainting
Tremor	Anxiety	Restlessness

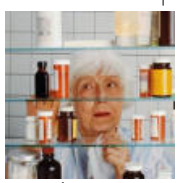
Adverse Drug Reactions

Common Culprits

Benzodiazepines	Anti-hypertensives	Diuretics
NSAIDS	Systemic steroids	Theophylline
Warfarin	Cimetidine	Digoxin

Interventions

Encourage clients to:



- Take all medications to each doctor visit.
- Never break or split a time-released medication.
- Use just one pharmacy.
- Report side effects to doctor promptly.
- Throw out discontinued or outdated medications.
- Take medications as directed.

Proper Disposal of Medications

Proper Disposal of Medications

1. Keep the medication in its original container.
2. Modify the contents to discourage consumption.
3. Seal and conceal.
4. Discard the container in your garbage can.




Exercise: Using the Tools

Using Binder, Pill Book and Other medication references:

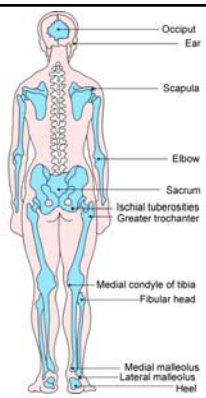
1. Look up diagnosis and medications.
2. What are the functional implications of each for this consumer?
3. What referrals, other follow up may be considered?

Procedures

Pressure Ulcer

Conditions that increase risk:

- Anti-inflammatory or immunosuppressant medications
- Diabetes
- Vascular diseases
- Immobility

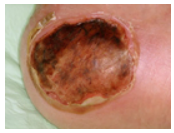


Pressure Ulcer Risk Assessment

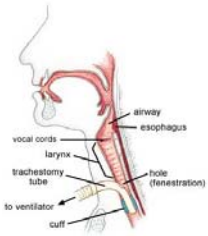
- **Sensory Perception**
  Ability to respond meaningfully to pressure-related discomfort
- **Moisture**
  Degree to which skin is exposed to moisture
- **Activity**
  Degree of physical activity
- **Mobility**
  Ability to change and control body position

Based on Braden Risk Assessment Scale

Wound Care



Tracheostomy Care

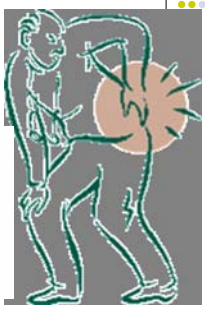


Ostomy

Living with Chronic Pain

The # 1 Complaint

- ☑ PAIN
- ☐ Cough or sore throat
- ☐ Sneezing
- ☐ Itching or watery eyes
- ☐ Drowsiness or fatigue



Definition of Pain

Pain is an unpleasant physical and emotional experience.

The emotional component of pain is called ***suffering***.

The sensation of pain is ***unique to each individual*** and is difficult to measure.

Acute vs. Chronic Pain

Acute Pain

Often begins suddenly and is short-lived.

Is a normal sensation in response to injury or disease; goes away when the problem heals.

Chronic Pain

Lasts for weeks, months or years.

Can result from injury or disease, or can occur for no apparent reason.

Chronic Pain . . .
Is neither protective nor beneficial

Chronic pain:

- Pain that lasts over six months, or persists beyond healing of the original injury or illness.
- Chronic diseases are often the underlying source of chronic pain.

Chronic pain interferes with everyday life

Obstacles to Pain Management

Treatment Issues

- Few health plans have systematic guidelines for pain management.
- Pain problems are often misunderstood, misdiagnosed, and poorly managed.
- Pain patients are often stigmatized.
- Doctors can be reluctant to prescribe strong pain medications.

Obstacles to Pain Management

Attitudes and Beliefs

Top three barriers to relief cited by Yolo County IHSS consumers in a 2006 survey:

- Don't like side effects from pain medication.
- Worried about addiction to pain medication.
- Don't think I can be helped.

Working with the Consumer in Pain

Believe the person.
People with pain are the only ones who know how much pain they're feeling.

Recognize that every person has the right to good pain control.

Functional Considerations

- Expect good and bad days.
- Expect medication control and side effects to effect functional ability.
- Some consumers will be less functional at the end of the day, and some less first thing in the morning.

Alzheimer's

Definition

Alzheimer's is the most common form of dementia among older people, which initially involves the parts of the brain that control thought, memory, and language.

Characteristics

- People with Alzheimer's live an average of eight years after diagnosis, although some people may live for as many as 20 years after being diagnosed.
- To help people understand the changes that occur as the disease progresses, Alzheimer's is broken into stages: early, middle and late.
- At the later stages, the person has lost most of their ability to function normally.
- The development of symptoms will differ from person to person, and that each stage will gradually progress over a period of years.

Functional Considerations

- It is also usual for people with Alzheimer's to have "good days" and "bad days." For example, a person with early-stage Alzheimer's may not show any symptoms one day; the next day he or she may have trouble remembering his/her name or finding the milk in the refrigerator.
- A person with Alzheimer's may engage in behaviors that put themselves at risk in the middle stage, but is unlikely to function well enough in the late stages to engage in such behaviors.
- In the middle stage, it may take an extraordinarily long time to perform such tasks as bathing and shampooing a person with Alzheimer's because of their fear of water.
- The person may be unable to select clothing and/or to dress self; may be resistant to change clothing.

National Institute on Aging | ADEAR Alzheimer's Disease Education & Referral Center | FCA FAMILY CAREGIVER ALLIANCE® National Center on Caregiving

Alzheimer's Disease Fact Sheet

Introduction

Dementia is a brain disorder that seriously affects a person's ability to carry out daily activities. **The most common form of dementia among older people is Alzheimer's disease (AD)**, which initially involves the parts of the brain that control thought, memory, and language. Although scientists are learning more every day, right now they still do not know what causes AD, and there is no cure. There are some drugs available that have been show to slow progression.

Scientists think that as many as 4.5 million Americans suffer from AD. The disease usually begins after age 60, and risk goes up with age. While younger people also may get AD, it is much less common. About 5 percent of men and women ages 65 to 74 have AD, and nearly half of those age 85 and older may have the disease. It is important to note, however, that AD is not a normal part of aging.

Biologic Factors in the Brain

Imaging techniques in patients with Alzheimer's disease have found significant loss of cells and volume in the regions of the brain devoted to memory and higher mental functioning. Important abnormalities have specifically been observed during biopsies:

- Twisted nerve cell fibers, known as neurofibrillary tangles
- A sticky protein called beta amyloid

These plaques and tangles in the brain are considered signs of AD.

Scientists also have found other brain changes in people with AD. Nerve cells die in areas of the brain that are vital to memory and other mental abilities, and connections between nerve cells are disrupted. There also are lower levels of some of the chemicals in the brain that carry messages back and forth between nerve cells. AD may impair thinking and memory by disrupting these messages.

What Causes AD?

Scientists do not yet fully understand what causes AD. There probably is not one single cause, but several factors that affect each person differently.

- Age is the most important known risk factor for AD. The number of people with the disease doubles every 5 years beyond age 65.
- Family history is another risk factor. Scientists believe that genetics may play a role in many AD cases. For example, early-onset familial AD, a rare form of AD that usually occurs between the ages of 30 and 60, is inherited. The more common form of AD is known as late-onset. It occurs later in life, and no obvious inheritance pattern is seen in most families.
- Several risk factor genes may interact with each other and with non-genetic factors to cause the disease. The only risk factor gene identified so far for late-onset AD is a gene that makes one form of a protein called apolipoprotein E (ApoE). Everyone has ApoE, which helps carry cholesterol in the blood. Only about 15 percent of people have the form that increases the risk of AD. It is likely that other genes also may increase the risk of AD or protect against AD, but they remain to be discovered.

Scientists still need to learn a lot more about what causes AD. In addition to genetics and ApoE, they are studying education, diet, and environment to learn what role they might play in the development of this disease. Scientists are finding increasing evidence that some of the risk factors for heart disease and stroke, such as high blood pressure, high cholesterol, and low levels of the vitamin folate, may also increase the risk of AD. Evidence for physical, mental, and social activities as protective factors against AD is also increasing.

What is the Progression of AD?

People with Alzheimer's live an average of eight years after diagnosis, although some people may live for as many as 20 years after being diagnosed. To help people understand the changes that occur as the disease progresses, AD is broken into stages: early, middle and late. It is important to remember, however, that the development of symptoms will differ from person to person and that each stage will gradually progress over a period of years. It is also not unusual for people with AD to have "good days" and "bad days." For example, a person with early-stage AD may not show any symptoms one day; the next he or she may have trouble remembering your name or finding the milk in the refrigerator.

The following summarizes the most common symptoms at each stage:

Symptoms of Early-Stage Alzheimer's

- Trouble remembering recent events and conversations
- Difficulty remembering the month or day of the week
- Loss of ability to manage finances
- Withdrawal from social situations and general apathy
- Cooking and shopping become more difficult
- Poor judgment – difficulty making wise decisions
- Tendency to lose things
- May become disoriented in familiar surroundings

Symptoms of Middle-Stage Alzheimer's

- Difficult behaviors emerge
    - Anger, suspiciousness, overreacting and paranoia (e.g., believing that family members are stealing money or spouse is having an affair)
    - Wandering
    - Repeating questions or statements
    - Sundowning (i.e., restlessness or agitation in the evenings)
    - Fear of bathing
    - Hallucinations
    - Eating problems
    - Incontinence
    - Hoarding belongings
    - Inappropriate sexual behavior
    - Violent behavior
- Will go from needing help choosing clothes and remembering to change clothes to needing help getting dressed.
- Will progress from needing reminders regarding personal care to needing help bathing, taking medication, brushing teeth, toileting, etc.
- Increased difficulty in verbal expression and comprehension
- Spatial problems (e.g., having trouble setting the table)
- Loss of reading, writing and arithmetic abilities
- Loss of coordination
- May be at risk if s/he isn't supervised 24 hours a day, seven days a week
- May not recognize family and friends at times

Symptoms of Late-Stage

- Inability to communicate
- Inability to recognize people, places and objects
- Cannot participate in any personal care activities
- Often not able to engage in activities that place himself/herself at risk
- Loses ability to walk
- Loses ability to smile

- Muscles may become contracted
- May lose ability to swallow
- Seizures may occur
- Weight loss
- Majority of time spent sleeping
- May exhibit a need to suck on items
- Incontinence

As the symptoms of AD increase, the emotional demands placed on the caregiver and the amount of personal care needed increase. Care becomes more physically demanding and more time-consuming. At some point, most caregivers require outside help.

How is AD Diagnosed?

An early, accurate diagnosis of AD helps patients and their families plan for the future. It gives them time to discuss care while the patient can still take part in making decisions. Early diagnosis will also offer the best chance to treat the symptoms of the disease.

Today, the only definite way to diagnose AD is to find out whether there are plaques and tangles in brain tissue. To look at brain tissue, however, doctors usually must wait until they do an autopsy. Therefore, doctors can only make a diagnosis of "possible" or "probable" AD while the person is still alive.

At specialized centers, doctors can diagnose AD correctly up to 90 percent of the time. Doctors use several tools to diagnose "probable" AD, including:

- questions about the person's general health, past medical problems, and ability to carry out daily activities,
- tests of memory, problem solving, attention, counting, and language,
- medical tests—such as tests of blood, urine, or spinal fluid, and
- brain scans.

Sometimes these test results help the doctor find other possible causes of the person's symptoms. **For example, thyroid problems, drug reactions, depression, brain tumors, and blood vessel disease in the brain can cause AD-like symptoms.** Some of these other conditions can be treated successfully.

The U.S. Agency for Health Care Policy Research provided this list of questions to help recognize the condition: Affirmative answers to these questions gives indication, but is not a diagnosis of the disease.

- **Learning and retaining new information**. Does the person misplace objects and/or have trouble remembering appointments or recent conversations? Is the person repetitive in conversation?
- **Handling complex tasks.** Do familiar activities like balancing a checkbook, cooking a meal, or other tasks that involve a complex train of thought, become increasingly difficult?
- **Ability to reason.** Does the person find it difficult to respond appropriately to everyday problems, such as a flat tire? Does a previously well-adjusted person disregard rules of social conduct?
- **Spatial ability and orientation**. Does driving and finding one's way in familiar surroundings become impossible? Does the person have problems recognizing familiar objects?
- **Language.** Does the person have difficulty following or participating in conversations? Does the person have trouble finding the words to express what they want to say?
- **Behavior**. Does the person seem more passive or less responsive than usual or more suspicious or irritable? Does the person have trouble paying attention?

How is AD Treated?

- AD is a slow disease, starting with mild memory problems and ending with severe brain damage.
- The course the disease takes and how fast changes occur vary from person to person.
- On average, AD patients live from 8 to 10 years after they are diagnosed, though some people may live with AD for as many as 20 years.

Treatments are focused on treating symptoms. No treatment can stop AD.

Medications

It is possible, however, to reduce some of the common symptoms of early-stage AD with medications. As of January 2002, the FDA had approved four drugs designed to improve memory and slow the progression of AD.

tacrine (Cognex)	• Many side effects, including potential liver damage and disappointing memory results. • Is still available but no longer actively marketed by the manufacturer.
donepezil (Aricept), rivastigmine (Exelon), or galantamine (Razadyne, previously known as Reminyl)	• For some people in the early and middle stages of the disease. • Have proved beneficial in improving memory, and have fewer side effects.
memantine (Namenda),	• Has been approved to treat moderate to severe AD, although it also is limited in its effects.
Other such as tranquilizers, sleeping aids, antidepressants	• Help control behavioral symptoms of AD such as sleeplessness, agitation, wandering, anxiety, and depression. Treating these symptoms often makes patients more comfortable and makes their care easier for caregivers.
Vitamin E	• May have some positive effects without unwanted side-effects if taken in reasonable quantities.

Advancing Understanding

Scientists have come a long way in their understanding of AD. Findings from years of research have begun to clarify differences between normal age-related memory changes, mild cognitive impairment, and AD. Scientists also have made great progress in defining the changes that take place in the AD brain, which allows them to pinpoint possible targets for treatment.

These advances are the foundation for the NIH Alzheimer's Disease Prevention Initiative, which is designed to:

- understand why AD occurs and who is at greatest risk of developing it,
- improve the accuracy of diagnosis and the ability to identify those at risk,
- discover, develop, and test new treatments, and discover treatments for behavioral problems in patients with AD.

Caregiver Considerations

Most often, spouses and other family members provide the day-to-day care for people with AD. As the disease gets worse, people often need more and more care. This can be hard for caregivers and can affect their physical and mental health, family life, job, and finances.

As the disease progresses, the person's personality, abilities, and moods may change. As the caregiver helps the person, s/he should be encouraged to be patient and always look for new ways to do things. Something that worked one day may not work the next.

Getting Dressed

Clothing is a good way for a person to express themselves. Looking good can make a person feel better. That's why it's important to think about what the person likes and what they don't like.

- Don't rush the person. Be flexible. If the person wants to wear the same outfit over and over, try getting more than one of the outfit or get ones that are similar.
- Make sure clothing is simple and comfortable. Shirts or sweaters with buttons in front are easier to wear than pullover tops. Also, larger clothes may be easier for the person to put on.
- It's common for someone with Alzheimer's to wear layers of clothing. Try not to worry. If they are too hot, they will remove some of the items.
- People with Alzheimer's sometimes don't like to change their clothes. In this case, dress them in clothes that can be worn during the day and to sleep at night.

Eating Meals

Eating problems are often seen in people with Alzheimer's as the disease progresses. In the beginning, there may be changes in the person's appetite. What they like to eat may change as well. Sometimes there will be weight loss, overeating, or trouble with eating. To encourage people with Alzheimer's to eat, some simple changes can be a big help. Snacks between meals can help increase weight. A change in mealtime routines, such as playing soft music, has also been shown to keep people at the dinner table longer.

To help, make changes in how food is served:

- Take away pits, bones, peels, or wrappers. Food should be able to go straight from the plate to the mouth.
- Reduce distractions such as the phone or television during mealtime.
- Serve foods that can be eaten easily, or with their hands.
- Add different textures and color to food. It will help keep them interested in what they're eating.

Driving

Alzheimer's affects many of the functions that a person needs to drive safely. It is important for families to think about the issue of driving and talk about it with the doctor. If any of the changes below are present, they should no longer be driving.

Being confused:

- Getting lost
- Forgetting to use turn signals
- Confusing the brake pedal and the gas pedal
- Being confused about directions or detours

Driving unsafely:

- Hitting the curb while driving
- Failing to yield
- Problems with changing lanes or making turns
- Driving at the wrong speeds

It is important to be sensitive when informing the person they can no longer drive. Remember, Alzheimer's disease affects the ability to reason. Don't try too hard to convince the person. A simple statement may be best. If the person won't stop driving, here are some things to consider:

- Have the doctor call the State Department of Motor Vehicles to ask that (he/she) take a driver's test.
- Try other ways to get around such as buses, taxis, senior vans, family, and friends.
- Check with the local Alzheimer's Association to learn about transportation options in the community.

Dental Care
Good dental care can be hard for people with Alzheimer's. Brushing is sometimes hard because the person can't understand or won't accept help from others.

- Break the activity into its components. Keep instructions short. Like "hold your toothbrush," "put paste on the brush," "brush your top teeth," and so on.
- Show them how to do it. Hold a brush and show the person how to brush their teeth. Try to brush teeth or dentures after each meal and make sure they floss every day. Also remove and clean dentures every night. While the dentures are out, brush the person's gums and roof of the mouth.
- Caregivers are key in helping the person have good dental care. They are the ones most likely to notice any problems. Report any problems to the dentist right away. Tell the dentist that the person has Alzheimer's, so they can create a special routine.

Bathing
Bathing is often the hardest personal care task that caregivers face. Because it is so private, the person with Alzheimer's may feel embarrassed or threatened. Many with AD are afraid of, or dislike water adding to the difficulty of bathing.

- Plan ahead: make the room warmer and have bath towels nearby. Some people may not like to be undressed by someone else. In this case, wrap a towel around their shoulders to add more privacy.
- Make the person feel in control. Involve and coach him or her through each step.
- Create a safe and pleasing atmosphere. Place non-slip adhesives on the floor surface. Put grab bars in the bathtub to prevent falls. Test the water in advance to prevent burns. Set the water heater to 120 degrees to avoid burns.

Using the Bathroom
Often, people with Alzheimer's have trouble using the bathroom. They may have loss of bladder and/or bowel control. It can be caused by many things. Some of these can be medicines, stress, a physical condition, and the environment.

- Make the bathroom easy to see. It's not unusual for a person with AD to mistake the closet for the bathroom. Post signs that read "toilet" to help someone find the bathroom. Keep the door open and a light on, especially at night. Paint the walls a different color than the toilet so the person can recognize it.
- Watch for signs the person has to use the toilet. Track how often they go to the bathroom, and take them to the bathroom ahead of time.
- Make sure clothes are easy to put on and take off, for using the bathroom.

Be supportive. Help the person with Alzheimer's keep a sense of dignity. Reassure them. It will help them be less embarrassed.

The Alzheimer's Association has chapters nationwide that provide educational programs and support groups for caregivers and family members of people with AD.

Home Safety with Alzheimer's

There are a lot of simple steps that can be taken to make the home safer for someone with Alzheimer's. Here are a few tips.

Make it Easier to See

- Add lighting in places between rooms, stairways, and bathrooms. Changes in levels of light can be confusing.
- Place different colored rugs in front of doors or steps to help the person expect staircases and doorways.

Make Daily Activities Safer

- Watch over the person when he or she is taking any medications.
- Close off all items or areas that could be a danger. Use locks and child safety latches.
- Clean out the refrigerator. Take out all food that may be spoiled.
- Limit the use of equipment that could be a danger. (Such as stoves/ovens, grills, toasters or knives).
- Try to get appliances that have an automatic shut-off. This can help prevent burns or fires.

Be Ready for an Emergency

- Keep a list of important phone numbers at hand. (Such as numbers for police, and fire, as well as the doctor, hospital and poison control.)
- Check fire extinguishers and smoke alarms. Have fire drills often.
- Consider signing up for the Safe Return Program at http://www.alz.org/Services/SafeReturn.asp. This is a nationwide program that helps those with Alzheimer's get home safely if they wander off alone.

Adapted (8-07) from: U.S DEPARTMENT OF HEALTH AND HUMAN SERVICES Public Health Service, National Institutes of Health, National Institute on Aging , July 2006 http://www.nia.nih.gov/Alzheimers/AlzheimersInformation/ and Family Caregiver Alliance, Alzheimer's Disease, Fact Sheet, http://www.caregiver.org/caregiver/jsp/content_node.jsp?nodeid=567 and http://www.alzheimersconcern.com/3008.php

The information is presented to inform IHSS social workers about medical conditions. It is not meant to contradict any information the consumer may receive from their personal physician. **All IHSS assessments should be individualized and are not diagnosis specific.**

The Alzheimer Caregiver

Alzheimer's disease is often called a family disease, because the chronic stress of watching a loved one slowly decline affects everyone. Comprehensive treatment must therefore address the needs of the entire family. This includes emotional support, counseling, and educational programs about Alzheimer's disease for individuals and family members as they strive to provide a safe and comfortable environment at home.

Through training, caregivers can learn how to control unwanted behaviors, improve communication, and keep the person with Alzheimer's safe. Research has shown that caregivers benefit from training and support groups and that participation in these groups allows caregivers to care for their loved one at home longer. The resources listed at the end of this fact sheet can help you find classes and support groups.

The role of the caregiver changes over time as the needs of the person with AD change. The following suggestions can help caregivers prepare for the future.

Caregiving in the Early Stage

During the early stage of AD, both the caregiver and the care person with AD can adjust to the diagnosis and make plans for the future:

- **Learning**: The more you know about AD, the easier it will be for you as a caregiver. Learn as much as you can about the early and middle stages of AD—don't worry about the late stage yet. Finding other caregivers to talk to can also be a great way to learn about and make sense of your own experience. One of the most difficult things to learn is to differentiate between the disease and your loved one: especially in the early stage, caregivers may find themselves thinking, "He's doing this to spite me!" or "She is just being lazy." In these cases, the behavior that is upsetting to the caregiver is usually a result of the disease process, not an attempt by the person with AD to hurt or frustrate the caregiver.
- **Emotional Support:** A diagnosis of AD can be a heart-wrenching experience for both the person diagnosed and the caregiver. Getting appropriate emotional support through counseling, a support group or other family members is extremely important. The goal is to establish a system of emotional support that will grow and change with you as your caregiving role and the emotional challenges of that role expand and change.
- **Family Roles:** As the disease progresses, it will be harder for the person with AD to fulfill the roles they have typically played in the family. For example, if he or she was the only driver in the family, it will be important for family members to find alternative means of transportation (e.g., learning how to drive, recruiting volunteer drivers from among family and friends, using public transportation, etc.) If the person with AD was in charge of household finances, someone else will need to assume this role. If the person with AD customarily prepared all of the meals, now is the time for the caregiver to begin learning how to cook. Focusing on these issues early will allow the person with AD to help the caregiver prepare for the future.
- **Finances:** AD can be an extremely costly disease. The life span of someone with Alzheimer's can range from two to more than 20 years. It is important to begin mapping out strategies for meeting the increasing financial demands placed on the family as the disease progresses. Financial planning should include reviewing your insurance coverage (e.g., health, disability, long-term care, etc.). Be aware that Medicare does not cover long-term care or custodial care. Health insurance counseling is available free to seniors. To locate help in your community, call the Eldercare Locator at (800) 677-1116 or HICAP at (800) 434-0222.
- **Legal:** Eventually the person with AD will need help paying the bills, getting medical care, and making decisions. Two legal documents, Power of Attorney for Finances and Power of Attorney for Healthcare, can ensure that the person with AD is cared for by trusted family members or friends. Without these documents, caregivers may have to go through court proceedings to get the right to make decisions on behalf of the person with AD. The family may also lose access to bank accounts. Free and low-cost legal services are available to seniors. See the resource section of this fact sheet for organizations that can help with legal questions and services.

Caregiving in the Middle Stage

During middle stage of AD, the caregiver's role will expand to full time. Keeping the person with AD safe will become a priority. Both the person with AD and the caregiver will need help and support.

- **Emotional Support:** People caring for loved ones with AD frequently feel isolated, and it is common for caregivers to suffer from grief and loss as the person they are caring for changes. Getting emotional support and taking periodic breaks from the responsibilities of caregiving is crucial to the mental and physical health of caregivers. Be sure to speak to your physician if you feel depressed or anxious.
- **Respite Care:** Caregivers need breaks, which is what "respite care" really is. Respite care includes adult day care programs, in-home help, and short nursing home stays. Other family members or friends, professional caregivers, or volunteer caregivers can provide respite care. The local Area Agency on Aging can provide information about the options available in the local community. If your family member is on IHSS, the Public Authority in your county may help you find a substitute provider to give you some time away when you need a break.
- **Safety:** Creating a safe and comfortable environment is important. An occupational therapist can provide advice and help in making the home safer for both the caregiver and care recipient. Ask your physician, the local Alzheimer's Association or the Area Agency on Aging for a referral to a professional experienced in home modification and assistive devices. For people with AD who wander, the local police should be advised, and the person should be registered with the Alzheimer's Association's Safe Return program.
- **Medical Care**: The person with AD will need ongoing medical care both for AD and for any other health problems that might arise. The caregiver will become the spokesperson for the person with AD. It is important to develop relationships with physicians and other health care professionals who understand the caregiver's role and who work with the caregiver as a team member in providing appropriate medical care. If the physician does not listen to you and respect your role as a caregiver, find a new physician. The stress of caregiving can affect your health. Be sure to take care of yourself. If you need to be hospitalized or need time off from your caregiving duties, emergency respite care can be arranged. Caregivers whose health is seriously affected may need to look at options for having a residential facility provide care for your loved one.
- **Planning for the Future:** Many caregivers wish to keep their loved one at home with them; however, this is not always possible. If more care—or a different type of care—is needed than what you can provide at home, look into residential care options. Many facilities have special programs for individuals with dementia. Another option is to arrange for another person to share the caregiving responsibilities.

Caregiving in the Late Stage

- **Hospice:** Hospice services are designed to support individuals at the end of life. Services may include support groups, visiting nurses, pain management and home care. Hospice services are usually arranged through the treating physician, and are usually not available until the physician anticipates that a person has less than six months to live. Several organizations specialize in helping families deal with the challenges involved in end-of-life care.
- **Placement:** Families caring for a loved one with end-stage Alzheimer's should give thoughtful consideration to placement in a skilled nursing facility, where adequate management and supervision can be provided.

Alzheimer's disease poses challenges for both the person diagnosed with AD and the caregivers. However, it does not mean that there will no longer be times of joy, shared laughter and companionship. AD develops gradually, which means that there is time to plan ahead, time to adjust to the diagnosis and time to enjoy being with each other.

Credits

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Adapted 8-07 from original document: Prepared by Family Caregiver Alliance in cooperation with California's Caregiver Resource Centers. Funded by the California Department of Mental Health. Reviewed by William Jagust, M.D., Professor and Chair, Neurology Department, UC Davis Center for Neuroscience.

The information is presented to inform IHSS social workers about medical conditions. It is not meant to contradict any information the consumer may receive from their personal physician. **All IHSS assessments should be individualized and are not diagnosis specific.**

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fact sheet

alzheimer's association®

Alzheimer's Association Safe Return®

The Alzheimer's Association is working to help save lives through its Alzheimer's Association Safe Return® program.

Alzheimer's disease causes millions of Americans to lose their ability to recognize familiar places and faces. Six in 10 people with Alzheimer's disease will wander. They may become disoriented and lost, even in their own neighborhood. Although common, this wandering behavior can be dangerous. If not found within 24 hours, half of those who wander risk serious injury or death. Wandering is among the biggest challenges caregivers face.

There is help

The Alzheimer's Association Safe Return® program assists in the safe return of individuals with Alzheimer's disease or a related dementia who wander and become lost.

Safe Return is a nationwide identification and support program working at the community level. Assistance is available 24 hours a day, whenever a person is lost or found. One call immediately activates the community support network to help reunite a lost person with Alzheimer's disease with his or her caregivers. When an individual is missing, Safe Return faxes the enrolled person's information and photo to local law enforcement. When a person is found, a citizen or law official calls the 800-number, and Safe Return notifies listed contacts. The local Alzheimer's Association chapter provides support to the family during the incident.

Safe Return benefits

- The Alzheimer's Association 24-hour toll-free emergency incident line
- A registration line available Monday through Friday between 7 a.m. and 11:30 p.m. (CST)
- Personalized identification products
- Five steps for a Safe Return magnet card, which provides useful tips when someone is missing
- Enrollment in a national information and photo database that includes emergency contact information to help reunite a lost person with his or her caregivers
- The Alzheimer's Association 24/7 Helpline, which is available day and night, every day, for information and care consultation
- Your Alzheimer's Association local chapter, which provides information, referral and other services
- Education and training on wandering behavior for families, caregivers and emergency responders

For safety and peace of mind, enroll in Safe Return today:

Contact us toll-free at **1.888.572.8566** or online at **www.alz.org/safereturn**

The Alzheimer's Association, the world leader in Alzheimer research, care and support, is dedicated to finding prevention methods, treatments and an eventual cure for Alzheimer's.

24/7 Helpline **1.800.272.3900**
TDD Access **312.335.8882**
Web site **www.alz.org**
e-mail **info@alz.org**
Fact sheet updated **September 2006**

Asthma

Definition

Asthma is a chronic disease of the respiratory system in which the airway occasionally constricts, becomes inflamed, and is lined with excessive amounts of mucus, often in response to one or more triggers.

Characteristics

- Inflammation makes the airways very sensitive, and they tend to react strongly to things that the patient is allergic to or find irritating.
- When the airways react, they get narrower, and less air flows through to the lung tissue.
- This causes symptoms like wheezing (a whistling sound when you breathe), coughing, chest tightness, and trouble breathing, especially at night and in the early morning.
- Triggers include allergens such as animal dander, molds, dust and pollen, and irritants such as smoke, perfumes and cold air. Other triggers can be medications, foods, or chemicals.
- Asthma cannot be cured, but most people with asthma can control it so that they have few and infrequent symptoms and can live active lives.

Functional Considerations

- If the disease is under control, most people will have few limitations.
- During attacks, the patient may have difficulties with exertion and exercise.
- Heavy cleaning may be appropriate to dustproof the bedroom.
- It may be appropriate to make an exception to the Domestic Time per Task standard in order to keep the home dustproof and free from dust mites.
- Having asthma alone may not be a basis for needing Domestic services; the consumer could wear a dust mask and perform needed laundry and house cleaning.

National Heart Lung and Blood Institute

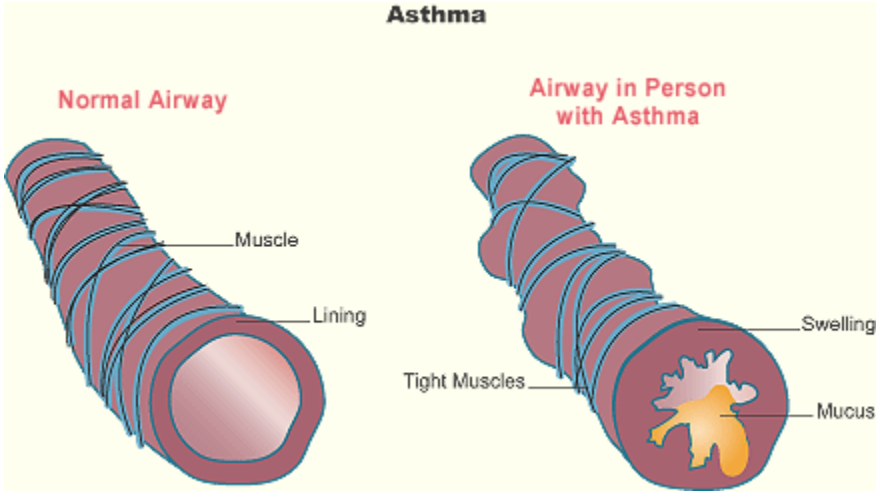
Asthma

What is Asthma?

Asthma is a chronic disease that affects the airways. In asthma, the inside walls of the airways are inflamed. The inflammation makes the airways very sensitive, and they tend to react strongly to things that the patient is allergic to or find irritating. When the airways react, they get narrower, and less air flows through to the lung tissue. This causes symptoms like wheezing (a whistling sound when you breathe), coughing, chest tightness, and trouble breathing, especially at night and in the early morning.

Asthma cannot be cured, but most people with asthma can control it so that they have few and infrequent symptoms and can live active lives.

When your asthma symptoms become worse than usual, it is called an **asthma episode or attack**. During an asthma attack, muscles around the airways tighten up, making the airways narrower so less air flows through. Inflammation increases, and the airways become more swollen and even narrower. Cells in the airways may also make more mucus than usual. This extra mucus also narrows the airways. These changes make it harder to breathe.



Asthma attacks are not all the same—some are worse than others. In a severe asthma attack, the airways can close so much that not enough oxygen gets to vital organs. This condition is a medical emergency. People can die from severe asthma attacks.

What Causes Asthma?

It is not clear exactly what makes the airways of people with asthma inflamed in the first place. Inflamed airways may be due to a combination of things. If there is a history of asthma in the family a person is more likely to develop it. New research suggests that being exposed to things like tobacco smoke, infections, and some allergens early in life may increase chances of developing asthma.

National Heart Lung and Blood Institute

What Causes Asthma Symptoms and Attacks?

There are things in the environment that bring on your asthma symptoms and lead to asthma attacks. Some of the more common things include exercise, allergens, irritants, and viral infections. Some people have asthma only when they exercise or have a viral infection.

The list below gives some examples of things that can bring on asthma symptoms.

Allergens

- Animal dander (from the skin, hair, or feathers of animals)
- Dust mites (contained in house dust)
- Cockroaches
- Pollen from trees and grass
- Mold (indoor and outdoor)

Irritants

- Cigarette smoke
- Air pollution
- Cold air or changes in weather
- Strong odors from painting or cooking
- Scented products
- Strong emotional expression (including crying or laughing hard) and stress

Others

- Medicines such as aspirin and beta-blockers
- Sulfites in food (dried fruit) or beverages (wine)
- A condition called gastroesophageal reflux disease that causes heartburn and can worsen asthma symptoms, especially at night
- Irritants or allergens that you may be exposed to at your work, such as special chemicals or dusts
- Infections

This is not a complete list of all the things that can bring on asthma symptoms. People can have trouble with one or more of these.

What are the Signs and Symptoms of Asthma?

Common asthma symptoms include:

1. Coughing	Is often worse at night or early in the morning, making it hard to sleep.
2. Wheezing	A whistling or squeaky sound during breathing.
3. Chest tightness	Shortness of breath. Some people say they can't catch their breath, or they feel breathless or out of breath. They feel like they can't get enough air in or out of their lungs. This can feel like something is squeezing or sitting on the chest.
4. Faster or noisy breathing	

Not all people have these symptoms, and symptoms may vary from one asthma attack to another. Symptoms can differ in both severity and frequency. Symptoms can be severe and life threatening.

How is Asthma Diagnosed?

The doctor will gather a medical history and physical exam. This includes family history, symptoms and their character, as well as listening to breath sounds. A **spirometer** may be used to measure how well a patient can blow out air from the lungs. The results will be lower than normal if your airways are inflamed and narrowed, or if the muscles around airways have tightened up.

Other tests may include:

- Allergy testing – to find out if and what allergens the patient is affected by.
- Peak flow meter – used every day for 1-2 weeks to check breathing. A peak flow meter is a hand-held device that helps monitor breathing.

Severity of your asthma will determine treatment.

Based on symptoms, the four levels of asthma severity are:

Mild intermittent (comes and goes)	Episodes of asthma symptoms twice a week or less; bothered by symptoms at night twice a month or less; between episodes, however, have no symptoms and lung function is normal.
Mild persistent	Asthma symptoms more than twice a week, but no more than once in a single day; bothered by symptoms at night more than twice a month; may have asthma attacks that affect activity.
Moderate persistent	Symptoms every day; bothered by nighttime symptoms more than once a week; asthma attacks may affect activity.
Severe persistent	Symptoms throughout the day on most days; bothered by nighttime symptoms often; physical activity is likely to be limited.

Anyone with asthma can have a severe attack – even people who have intermittent or mild persistent asthma.

How is Asthma Treated?

Asthma treatment includes:

- Working closely with the doctor to decide what treatment goals are and learning how to meet those goals.
- Avoiding things that bring on asthma symptoms or make symptoms worse. Doing so can reduce the amount of medicine needed to control asthma.
- Using asthma medicines. Allergy medicine and shots may also help control asthma in some people.
- Monitoring asthma in order to recognize when symptoms are getting worse and respond quickly to prevent or stop an asthma attack.

With proper treatment, a patient should ideally have these results:

- Asthma should be controlled.
- Should be free of asthma symptoms.
- Should have fewer attacks.
- Should need to use quick-relief medicines less often.
- Should be able to do normal activities without having symptoms.

National Heart Lung and Blood Institute

Medicines for Asthma

There are two main types of medicines for asthma:

Quick-relief medicines—taken at the first signs of asthma symptoms for immediate relief of these symptoms. Effects of medicines felt within minutes.	
Short acting beta-agonists	Bronchodilators should be taken when first begin to feel asthma symptoms.
Long-term control medicines—taken every day, usually over long periods of time, to prevent symptoms and asthma episodes or attacks. Effects felt after taking them for a few weeks. People with persistent asthma need long-term control medicines.	
Inhaled corticosteroids	Reduces the airway swelling.
Long-acting beta-agonists	Muscle relaxant to dilate airways.
Leukotriene modifiers	Leukotrienes are chemicals in the body that cause airway constriction, excess mucus production, and inflammation and swelling in the lungs. Leukotriene modifiers prevent these things from happening. montelukast, zafirlukast, and zileuton.
Non-Steroidal Anti-Inflammatory	It blocks early and late-phase allergy-caused symptoms if used before allergen exposure; Cromolyn and nedocromil.
Theophylline	Bronchodilator, that it relieves the constriction in the airways. It also increases the ability of the diaphragm to contract and improves clearance of mucus from the airways.

If the patient is taking long-term control medicines, their asthma will likely worsen again.

Many people with asthma need both a short-acting bronchodilator to use when symptoms worsen and long-term daily asthma control medicines to treat the ongoing inflammation.

Most asthma medicines are inhaled. They go directly into the lungs where they are needed. There are many kinds of inhalers, and many require different techniques. It is important that the patient knows how to use the inhaler correctly.

Treating Asthma in Children

Children with asthma, like adults with asthma, should see a doctor for treatment of their asthma. Treatment may include allergy testing, finding ways to limit contact with things that bring on asthma attacks, and taking medicine.

Young children will need help from their parents and other caregivers to keep their asthma under control. Older children can learn to care for themselves and follow their asthma self-management plan with less supervision.

Asthma medicines for children are like those adults use, but doses are smaller. Children with moderate or severe asthma should learn to use a peak flow meter to help keep their asthma under control. Using a peak flow meter can be very helpful because children often have a hard time describing their symptoms.

Caregivers should be alert for possible signs of asthma in children, such as coughing at night, frequent colds, wheezing, or other signs of breathing problems.

National Heart Lung and Blood Institute

Treating Asthma in Older Adults

Older adults may need to adjust their asthma treatment

- Other diseases or conditions that they have could complicate the disease.
- Some medicines (like beta blockers used for treating high blood pressure and glaucoma; aspirin; and nonsteroidal anti-inflammatory drugs) can interfere with asthma medicines or even cause asthma attacks.
- Should report all medicines taken, including over-the-counter ones.
- Using steroids may affect bone density in adults, may need to take calcium and vitamin D supplements.

Living with Asthma

It is important the patient knows how to take care of himself/herself.

- Tell the doctor about all other current medications, in case one of them affects asthma.
- Follow asthma self-management plan and have regular checkups.
- Learn to use medication correctly. This is very important. If inhalers are not used correctly, less medication will get into the airways.
- Make sure the doctor is notified if there are any problems with taking medications.

Ways to Limit Symptoms

It may help to **limit contact with the following**:

- If animal dander is a problem, keep pet out of the house or at least out of the bedroom, or find it a new home.
- Do not smoke or allow smoking in the home.
- If pollen is a problem, stay indoors with the air conditioner on, if possible, when the pollen count is high.
- To control dust mites, wash sheets, blankets, pillows, and stuffed toys once a week in hot water. There are special dust proof covers for mattress and pillows.
- If cold air is a problem, wear a scarf and cover the mouth and nose in the winter.
- If exercise induces symptoms, work with the doctor to find ways to be active without having asthma symptoms. Physical activity is important.
- People with allergies to sulfites should avoid foods (like dried fruit) or beverages (like wine) that contain them.

Be alert for **warning signs** of an asthma attack.

- Watch for symptoms (for example, coughing, wheezing, chest tightness, and difficulty breathing) and use quick-relief medicine as directed by the doctor.
- Use a peak flow meter as directed to monitor asthma.

If asthma is not under control, there will be **signs that should not be ignored**. The following are some signs that asthma is getting worse:

- Have asthma symptoms more often than usual.
- Asthma symptoms are worse than they used to be.
- Asthma symptoms are bothersome at night and causing sleep loss.
- Are missing school or work because of asthma.
- Peak flow number is low or varies a lot from day to day.
- Asthma medicines do not seem to be working very well anymore.
- Have to use short-acting quick-relief, or "rescue," inhaler more often. (Using quick-relief medicine every day or using more than one inhaler a month is too much.)
- Have to go to the emergency room or doctor because of an asthma attack.
- End up in the hospital because of your asthma.

If asthma is getting worse the patient should see their doctor. It is possible there need to be changes in medications or other treatments.

National Heart Lung and Blood Institute

Helping Your Child Live With Asthma

Children with asthma need the help of parents, other caregivers, teachers, and health care professionals to keep their asthma under control.

Ways to help:

- Take the child to the doctor for regular checkups and treatment.
- Make sure the child has an asthma self-management plan and that the caregiver knows how to follow it.
- Help the child learn about asthma and how to control it.
- Help the child learn what things cause his or her asthma symptoms and how to avoid them, if possible.
- Protect the child from tobacco smoke by not smoking and not allowing people to smoke in the home.
- Find ways to reduce the child's exposure to allergens that bring on asthma attacks, like pollen, dust mites, cockroaches, or animal dander.
- Make sure the child knows how to take asthma medicines correctly.
- Make sure the child uses a peak flow meter to help monitor and control asthma.
- Encourage the child to take part in physical activity. Work to keep his or her asthma under control, though activity is good.
- Talk to the child's other caregivers, teachers, or coaches about his or her asthma; inform them of the child's asthma self-management plan.

Adapted (8-07) from National Heart Lung and Blood Institute Diseases and conditions index
http://www.nhlbi.nih.gov/health/dci/Diseases/Asthma/Asthma_All.html 7-07

How to Create a Dust-free Bedroom

If you are dust-sensitive, especially if you have allergies and/or asthma, you can reduce some of your misery by creating a "dust-free" bedroom. Dust may contain molds, fibers, and dander from dogs, cats, and other animals, as well as tiny dust mites. These mites, which live in bedding, upholstered furniture, and carpets, thrive in the summer and die in the winter. They will, however, continue to thrive in the winter if the house is warm and humid. The particles seen floating in a shaft of sunlight include dead mites and their waste products. The waste products actually provoke the allergic reaction.

The routine cleaning necessary to maintain a dust-free bedroom also can help reduce exposure to cockroaches, another important cause of asthma in some allergic people.

You probably cannot control dust conditions under which you work or spend your daylight hours. To a large extent, however, you can eliminate dust from your bedroom. To create a dust-free bedroom, you must reduce the number of surfaces on which dust can collect.

In addition to getting medical care for your dust allergy and/or asthma, the National Institute of Allergy and Infectious Diseases suggests the following guidelines.

Preparation

- Completely empty the room, just as if you were moving.
- Empty and clean all closets and, if possible, store contents elsewhere and seal closets.
- Keep clothing in zippered plastic bags and shoes in boxes off the floor, if you cannot store them elsewhere.
- Remove carpeting, if possible.
- Clean and scrub the woodwork and floors thoroughly to remove all traces of dust.
- Wipe wood, tile, or linoleum floors with water, wax, or oil.
- Cement any linoleum to the floor.
- Close the doors and windows until the dust-sensitive person is ready to use the room.

Maintenance

- Wear a filter mask when cleaning.
- Clean the room thoroughly and completely once a week.
- Clean floors, furniture, tops of doors, window frames and sills, etc., with a damp cloth or oil mop.
- Carefully vacuum carpet and upholstery regularly.
- Use a special filter in the vacuum.
- Wash curtains often at 130 degrees Fahrenheit.
- Air the room thoroughly.

Carpeting and Flooring

Carpeting makes dust control impossible. Although shag carpets are the worst type to have if you are dust sensitive, all carpets trap dust. Therefore, health care experts recommend hardwood, tile, or linoleum floors. Treating carpets with tannic acid eliminates some dust mite allergen. Tannic acid, however, is

- not as effective as removing the carpet
- is irritating to some people
- must be applied repeatedly

Beds and Bedding

Keep only one bed in the bedroom. Most importantly, encase box springs and mattress in a zippered dust-proof or allergen-proof cover. Scrub bed springs outside the room. If you must have a second bed in the room, prepare it in the same manner. Use only washable materials on the bed. Sheets, blankets, and other bedclothes should be washed frequently in water that is at least 130 degrees Fahrenheit.

- Lower temperatures will not kill dust mites.
- If you set your hot water temperature lower (commonly done to prevent children from scalding themselves), wash items at a laundromat which uses high wash temperatures.
- Use a synthetic, such as Dacron, mattress pad and pillow. Avoid fuzzy wool blankets or feather- or wool-stuffed comforters and mattress pads.

Furniture and Furnishings

Keep furniture and furnishings to a minimum.

- Avoid upholstered furniture and blinds.
- Use only a wooden or metal chair that you can scrub.
- Use only plain, lightweight curtains on the windows.

Air Control

Air filters-either added to a furnace or a room unit-can reduce the levels of allergens. Electrostatic and HEPA (high-efficiency particulate absorption) filters can effectively remove many allergens from the air. If they don't function right, however, electrostatic filters may give off ozone, which can be harmful to your lungs if you have asthma.

A dehumidifier may help because house mites need high humidity to live and grow. You should take special care to clean the unit frequently with a weak bleach solution (1 cup bleach in 1 gallon water) or a commercial product to prevent mold growth. Although low humidity may reduce dust mite levels, it might irritate your nose and lungs.

Children

In addition to the above guidelines, if you are caring for a child who is dust-sensitive

- Keep toys that will accumulate dust out of the child's bedroom
- Avoid stuffed toys
- Use only washable toys of wood, rubber, metal, or plastic
- Store toys in a closed toy box or chest

Pets

Keep all animals with fur or feathers out of the bedroom. If you are allergic to dust mites, you could also be allergic or develop an allergy to cats, dogs, or other animals.

Although these steps may seem difficult at first, experience plus habit will make them easier. The results-better breathing, fewer medicines, and greater freedom from allergy and asthma attacks-will be well worth your effort.

NIAID is a component of the National Institutes of Health (NIH), which is an agency of the Department of Health and Human Services. NIAID supports basic and applied research to prevent, diagnose, and treat infectious and immune-mediated illnesses, including HIV/AIDS and other sexually transmitted diseases, illness from potential agents of bioterrorism, tuberculosis, malaria, autoimmune disorders, asthma and allergies. **News releases, fact sheets and other NIAID-related materials are available on the NIAID Web site at http://www.niaid.nih.gov.**

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National Institute of Allergy and Infectious Diseases
National Institutes of Health
Bethesda, MD 20892

Autoimmunity

What is Autoimmunity?

The immune system defends the body against infectious agents (such as virus and bacteria) and abnormal cells (such as cancer) that develop within the body. When the Immune cells mistake the body's own cells as invaders and attack them the system can be harmful. This can affect almost any part of the body and sometimes may affect many parts of the body at once. This is called autoimmunity (meaning self-immunity).

What Causes Autoimmunity?

No one knows why the immune system treats some body parts like germs. People can't catch autoimmune diseases from another person. Most scientists think there is a genetic component and environmental component. If genetically predisposed, a person may be at higher risk for autoimmune disease, but won't get the disease until something environmental turns "on" the immune system. This may include the sun, infections, drugs, or, in some women, pregnancy.

What Kinds of Problems are Caused by Autoimmunity?

Autoimmunity can affect almost any organ or body system. The exact problem one has with autoimmunity (or its diseases) depends on which tissues are targeted.

- If the skin is the target - may have skin rashes, blisters, or color changes.
- If it's the thyroid gland - may be tired, gain weight, be more sensitive to cold, and have muscle aches.
- If it's the joints - may have joint pain, stiffness, and loss of function.

In many people, the first symptoms are fatigue, muscle aches, and low fever.

Where Does Autoimmunity Strike?

The following is a list (not inclusive) of body systems and the autoimmune diseases that can affect them. A Glossary of Terms defining these diseases begins on page 8.

Blood and blood vessels

- Autoimmune hemolytic anemia
- Pernicious anemia
- Polyarteritis nodosa
- Systemic lupus erythematosus
- Wegener's granulomatosis

Eyes

- Sjögren's syndrome
- Type 1 diabetes mellitus
- Uveitis

Heart

- Myocarditis
- Rheumatic fever
- Scleroderma
- Systemic lupus erythematosus

Digestive tract (including the mouth)

- Autoimmune hepatitis
- Behçet's disease
- Crohn's disease
- Primary bilary cirrhosis
- Scleroderma
- Ulcerative colitis

Glands

- Graves' disease
- Thyroiditis
- Type 1 diabetes mellitus

Joints

- Ankylosing spondylitis
- Rheumatoid arthritis
- Systemic lupus erythematosus

Kidneys
- Glomerulonephritis
- Systemic lupus erythematosus
- Type 1 diabetes mellitus

Muscles
- Dermatomyositis
- Myasthenia gravis
- Polymyositis

Skin
- Alopecia areata
- Pemphigus/pemphigoid
- Psoriasis
- Scleroderma
- Systemic lupus erythematosus
- Vitiligo 4

Lungs
- Rheumatoid arthritis
- Sarcoidosis
- Scleroderma
- Systemic lupus erythematosus

Nerves and brain
- Guillain-Barré syndrome
- Multiple sclerosis
- Systemic lupus erythematosus

How are Autoimmune Diseases Diagnosed?

Autoimmune diseases often don't show a clear pattern of symptoms at first, so diagnosing them can be hard. The doctor may be able to make a diagnosis quickly based on history, exam, and test results. But the process often takes time. It may take several visits to find out exactly what's wrong and the best way to treat it.

With time, a diagnosis can usually be made by using:

Medical history	• Symptoms and how long they have been present. • Symptoms may not point to one disease, but can be a starting point. • Having a family history of any autoimmune disease.
Physical exam	• Looking for potential physical signs of disease such as inflamed joints, swollen lymph nodes, or discolored skin.
Medical tests	• There isn't one test that will diagnose disease. • Blood tests such as those looking for autoantibodies may give an indication of disease. • Presence of autoantibiodies alone is not enough to diagnose a disease, but if present in conjunction with symptomology, a diagnosis can be more certain.

How are Autoimmune Diseases Treated?

Autoimmunity takes many forms. There are also many treatments for it. Treatment depends on the type of disease, how severe it is, and its symptoms.

Generally, treatments have one of three goals:

1. **Relieving symptoms**
   - Relieving symptoms may be as simple as taking a drug for pain relief.
   - It may also be as involved as having surgery.

2. Preserving organ function	• Treatment may be needed to prevent damage. • Medications such as anti-inflammatory for lupus, or Insulin for diabetes won't stop disease, but save organ function. • These treatments can preserve organ function.
3. Targeting disease mechanisms	• Immunosuppressant drugs to target the cause of the disease. • cyclophosphamide (Cytoxan) and cyclosporine (Neoral and Sandimmune) are two examples.

What Types of Doctors Treat Autoimmune Diseases?

Treatments for autoimmune diseases vary, as do the types of doctors who provide them. For some people, one doctor will be enough to manage their disease. Others may require a team approach. One doctor might coordinate and give care, and others would treat specific organ problems.

Specialists may be involved in care:

Rheumatologist	Treats arthritis and other rheumatic diseases. These include scleroderma and systemic lupus erythematosus (lupus or SLE).
Endocrinologist	Treats gland and hormone problems. These include diabetes and thyroid disease.
Neurologist	Treats nerve problems. These include multiple sclerosis and myasthenia gravis.
Hematologist	Treats diseases that affect the blood. These include pernicious anemia and autoimmune hemolytic anemia.
Gastroenterologist	Treats problems with the digestive system. These include Crohn's disease and ulcerative colitis.
Dermatologist	Treats problems of the skin, hair, and nails. These include psoriasis, pemphigus/ pemphigoid, and alopecia areata.
Nephrologists	Treats kidney problems. These include glomerulonephritis, inflamed kidneys associated with lupus.

What are Some Other Problems Related to Autoimmune Diseases?

Having a chronic disease can affect a person in most every part of their life. Types of problems vary depending upon the autoimmune disease. They may include:

Looks and self-esteem	• Have discolored or damaged skin or hair loss. • Joints may be swollen or disfigured.	• Effects can be reduced with treatment. • Cosmetics, for example, can hide a skin rash. • Surgery can correct a malformed joint.
Self care	• Painful joints or weak muscles can make it hard to do simple tasks such as climbing stairs, making the bed, or brushing hair.	• Physical therapist. can teach exercises to improve strength and function. • Occupational therapist can help teach new ways to do things or provide tools to make tasks easier.

Family relationships	• May not understand why the person doesn't have energy to do things used to do. • May even think they are just being lazy. • May be overly concerned and eager to help. • May not let the person do the things they can do.	• Person should learn as much as much as possible about the disease. • Should share information with family. • Involve family in counseling or a support group.
Sexual relations	• For men, diseases that affect blood vessels can lead to problems with erection. • In women, damage to glands that produce moisture can lead to vaginal dryness. • Weakness or stiff joints may make it hard for them to move the way they once did. • May no longer feel attractive.	• With communication, good medical care, and perhaps counseling, many of these issues can be overcome or at least worked around.
Pregnancy and childbearing	• Autoimmune diseases can affect pregnancy, and pregnancy can affect autoimmune diseases. • Women with many diseases can safely have children. • How a pregnancy turns out can vary by disease and disease severity.	• The patient should consult a doctor about having children.

What Research is Being Conducted to Help People with Autoimmune Diseases?

The National Institutes of Health (NIH) supports research in autoimmune diseases. Here are a few examples:

Rheumatoid arthritis—The National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS) and the North American Rheumatoid Arthritis Consortium will study 1,000 siblings with rheumatoid arthritis. Scientists will look at gene material to find and identify parts of DNA involved in the disease. They will test for proteins called rheumatoid factor in the blood. And they will look at x-rays of the joints. This work will provide basic facts about the genetics of the disease.

Systemic lupus erythematosus (SLE) —NIAMS-supported scientists are studying whether women with lupus can safely take oral contraceptives or hormone replacement therapy. Previous research suggests that female hormones may contribute to the disease or make it worse.

Lupus nephritis—One NIAMS project is testing a drug that may be less toxic than the drugs now used for lupus nephritis (kidney disease caused by lupus).

Vitiligo—With NIAMS support, scientists are studying genes from pairs of siblings affected by this skin pigmentation disorder. They hope to find genes that may cause vitiligo and learn how they affect the skin.

Type 1 diabetes—Researchers supported by the National Institute of Diabetes and Digestive and Kidney Diseases have found a way to identify people who are likely to get type 1 diabetes (formerly known as juvenile diabetes). They are now testing ways to prevent these people from getting the disease.

Multiple sclerosis—Scientists supported by the National Institute of Neurological Disorders and Stroke are looking at the autoimmune system, infectious agents, and genes as culprits in multiple sclerosis (MS). Such studies strengthen the theory that MS comes from a number of factors rather than a single one. Studies use magnetic resonance imaging (MRI) to see how MS lesions evolve in the brain's white matter. Research has shown that MS has no bad effects on pregnancy, labor, or delivery. In fact, the stabilizing or remission of symptoms during pregnancy may be due to changes in a woman's immune system that allow her to carry a baby.

Multiple autoimmune diseases—The National Institute of Allergy and Infectious Diseases is supporting clinical trials of drugs that prevent the immune system from attacking healthy cells. The Institute wants to see if they are safe and useful. Such drugs may prove helpful for treating a number of autoimmune diseases.

Glossary of Terms

Antibodies—Special proteins produced by the body's immune system that help fight and destroy viruses, bacteria, and other foreign substances that invade the body.
Antigen—A substance (usually foreign) that stimulates the immune response. In people with autoimmune disease, the body's own cells may be seen as antigens.
Autoantibodies—Abnormal antibodies that attack parts of the body, causing autoimmune disease.
Autoimmune disease—A disease that occurs when the immune system turns against parts of the body it is designed to protect.
Fever—A rise in body temperature caused by the immune system's response to infection or disease.
Immune response—The reaction of the immune system against foreign substances. When the reaction occurs against the body's own cells or tissues, it is called an autoimmune reaction.
Immune system—A complex system that normally protects the body from infections. The immune system consists of a group of cells, the chemicals that control those cells, and the chemicals that those cells release.
Immunosuppressive drugs—Drugs that suppress the immune response and can be used to treat autoimmune disease. Unfortunately, because normal immunity is also suppressed with these drugs, they leave the body at risk for infection.
Infection—Invasion of the body tissues by bacteria or other tiny organisms that cause illness.
Inflammation—A reaction of tissues to injury or disease, typically marked by four signs: swelling, redness, heat, and pain.
Trigger—Something that either sets off a disease in people who are genetically predisposed to developing the disease, or that causes a certain symptom to occur in a person who has a disease. For example, sunlight can trigger rashes in people with lupus.

Glossary of Diseases

Autoimmunity plays a role in more than 80 diseases. Following are brief descriptions of some of the many diseases in which autoimmunity may be involved.

Note: Because the specific causes of many diseases are unknown, there is debate among scientists about whether some of these are truly autoimmune diseases. Some doctors may classify some of these diseases differently.

Alopecia areata	A disorder in which the immune system attacks the hair follicles, causing loss of hair on the scalp, face, and other parts of the body.
Ankylosing spondylitis	A rheumatic disease that causes inflamed joints in the spine and sacroiliac (the joints that connect the spine and the pelvis) and, in some people, inflamed eyes and heart valves.
Arthritis	A general term for more than 100 different diseases that affect the joints. Many forms of arthritis and related conditions are believed to have an autoimmune component.
Autoimmune hemolytic anemia	A condition in which immune system proteins attack the red blood cells, resulting in fewer of these oxygen-transporting cells.
Autoimmune hepatitis	A disease in which the body's immune system attacks liver cells, causing inflammation. If not stopped, inflammation can lead to cirrhosis (scarring and hardening) of the liver and eventually liver failure.
Behçet's disease	A condition characterized by sores in the mouth and on the genitals and by inflammation in parts of the eye. In some people, the disease also results in inflammation of the joints, digestive tract, brain, and spinal cord.
Crohn's disease	An inflammatory disease of the small intestine or colon that causes diarrhea, cramps, and excessive weight loss.
Dermatomyositis	A rare autoimmune disease that causes patchy red rashes around the knuckles, eyes, and other parts of the body along with chronic inflammation of the muscles. It may occur along with other autoimmune diseases such as rheumatoid arthritis or systemic lupus erythematosus.
Diabetes mellitus, type 1	A condition in which the immune system destroys insulin-producing cells of the pancreas, making it impossible for the body to use glucose (blood sugar) for energy. Type 1 diabetes usually begins in childhood and young adulthood.
Glomerulonephritis	Inflammation of the kidney's tiny filtering units, which in severe cases can lead to kidney failure.
Graves' disease	An autoimmune disease of the thyroid gland that results in the overproduction of thyroid hormone. This causes such symptoms as nervousness, heat intolerance, heart palpitations, and unexplained weight loss.
Guillain-Barré syndrome	A disorder in which the body's immune system attacks part of the nervous system, leading to numb, weak limbs and, in severe cases, paralysis.
Inflammatory bowel disease	The general name for diseases that cause inflammation in the intestine, the most common of which are ulcerative colitis and Crohn's disease.
Lupus nephritis	Damaging inflammation of the kidneys that can occur in people with lupus. If not controlled, it may lead to total kidney failure.
Multiple sclerosis	A disease in which the immune system attacks the protective coating called myelin around the nerves. The damage affects the brain and/or spinal cord and interferes with the nerve pathways, causing muscular weakness, loss of coordination, and visual and speech problems.
Myasthenia gravis	A disease in which the immune system attacks the nerves and muscles in the neck, causing weakness and problems with seeing, chewing, and/or talking.
Myocarditis	Inflamed and degenerating muscle tissue of the heart that can cause chest pain and shortness of breath. This can lead to congestive heart failure.

Pemphigus/pemphigoid	An autoimmune disease of the skin characterized by itching and blisters.
Pernicious anemia	A deficiency of the oxygen-carrying red blood cells that often occurs in people with autoimmune diseases of the thyroid gland.
Polyarteritis nodosa	An autoimmune disease that causes inflammation of the small and medium-sized arteries. This leads to problems in the muscles, joints, intestines, nerves, kidney, and skin.
Polymyositis	A rare autoimmune disease characterized by inflamed and tender muscles throughout the body, particularly those of the shoulder and hip girdles.
Primary biliary cirrhosis	A disease that slowly destroys the bile ducts in the liver. When the ducts are damaged, bile (a substance that helps digest fat) builds up in the liver and damages liver tissue.
Psoriasis	A chronic skin disease that occurs when cells in the outer layer of the skin reproduce faster than normal and pile up on the skin's surface. This results in scaling and inflammation. An estimated 10 to 30 percent of people with psoriasis develop an associated arthritis called psoriatic arthritis.
Rheumatic fever	A disease that can occur following untreated streptococcus (strep) infection. It most often affects children, causing painful, inflamed joints and, in some cases, permanent damage to heart valves.
Rheumatoid arthritis	A disease in which the immune system is believed to attack the linings of the joints. This results in joint pain, stiffness, swelling, and destruction.
Sarcoidosis	A disease characterized by granulomas (small growths of blood vessels, cells, and connective tissue) that can lead to problems in the skin, lungs, eyes, joints, and muscles.
Scleroderma	An autoimmune disease characterized by abnormal growth of connective tissue in the skin and blood vessels. In more severe forms, connective tissue can build up in the kidneys, lungs, heart, and gastrointestinal tract, leading in some cases to organ failure.
Sjögren's syndrome	A condition in which the immune system targets the body's moisture-producing glands, leading to dryness of the eyes, mouth, and other body tissues.
Systemic lupus erythematosus	An autoimmune disease, primarily of young women, that can affect many parts of the body, including the joints, skin, kidneys, heart, lungs, blood vessels, and brain.
Thyroiditis	An inflammation of the thyroid gland that causes the gland to become underactive. This results in symptoms such as fatigue, weakness, weight gain, cold intolerance, and muscle aches.
Ulcerative colitis	A disease that causes ulcers in the top layers of the lining of the large intestine. This leads to abdominal pain and diarrhea.
Uveitis	The inflammation of structures of the inner eye, including the iris (the colored tissue that holds the lens of the eye) and the choroid plexus (a network of blood vessels around the eyeball). Uveitis occurs with some rheumatic diseases, including ankylosing spondylitis and juvenile rheumatoid arthritis.
Vitiligo	A disorder in which the immune system destroys pigment-making cells called melanocytes. This results in white patches of skin on different parts of the body.
Wegener's granulomatosis	An autoimmune disease that damages the small and medium-sized blood vessels throughout the body, resulting in disease in the lungs, upper respiratory tract, and kidneys.

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Cerebral Palsy (CP)

Definition

CP is an umbrella term encompassing a group of non-progressive, non-contagious neurological disorders that cause physical disability in human development, specifically the human movement and posture.

Characteristics

It is caused by abnormalities inside the brain that disrupt the brain's ability to control movement and posture. In some cases of cerebral palsy, the cerebral motor cortex has not developed normally during fetal growth. In others, the damage is a result of injury to the brain either before, during, or after birth. In either case, the damage is not repairable and the **disabilities that result are permanent**.

Patients with cerebral palsy exhibit a wide variety of **symptoms**, including:

- lack of muscle coordination when performing voluntary movements (ataxia);
- stiff or tight muscles and exaggerated reflexes (spasticity);
- walking with one foot or leg dragging;
- walking on the toes, a crouched gait, or a "scissored" gait;
- variations in muscle tone, either too stiff or too floppy;
- excessive drooling or difficulties swallowing or speaking;
- shaking (tremor) or random involuntary movements; and
- difficulty with precise motions, such as writing or buttoning a shirt.

Some people with cerebral palsy also have other medical disorders, including mental retardation, seizures, impaired vision or hearing, and abnormal physical sensations or perceptions.

Sixty-five (65%) to ninety (90%) of children with cerebral palsy live into their adult years.

Functional Considerations

- Functional abilities can be severe and wide ranged.
- The symptoms of cerebral palsy differ in type and severity from one person to the next, and may even change in an individual over time so careful reassessment of function is important.
- Consider whether the consumer has spasticity that justifies extra time for Domestic and/or Laundry (due to excessive spilling during meals).
- If the consumer has difficulty swallowing, extra feeding time is probably justified.
- Consumers with CP are likely to be depressed.

Cerebral Palsy

What is Cerebral Palsy?

Doctors use the term cerebral palsy to refer to any one of a number of neurological disorders that appear in infancy or early childhood and **permanently affect body movement and muscle coordination but are not progressive**, in other words, they don't get worse over time.

- **cerebral** refers to the motor area of the brain's outer layer (called the cerebral cortex), the part of the brain that directs muscle movement;
- **palsy** refers to the loss or impairment of motor function.

Even though cerebral palsy affects muscle movement, it isn't caused by problems in the muscles or nerves. It is caused by abnormalities inside the brain that disrupt the brain's ability to control movement and posture.

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Cerebral palsy doesn't always cause profound disabilities. While one patient with severe cerebral palsy might be unable to walk and need extensive, lifelong care, another with mild cerebral palsy might be only slightly awkward and require no special assistance.

Cerebral palsy isn't a disease. It isn't contagious and it can't be passed from one generation to the next. There is no cure for cerebral palsy, but supportive treatments, medications, and surgery can help many individuals improve their motor skills and ability to communicate with the world.

How Many People Have Cerebral Palsy?

The United Cerebral Palsy (UCP) Foundation estimates that nearly 800,000 children and adults in the United States are living with one or more of the symptoms of cerebral palsy. According to the federal government's Centers for Disease Control and Prevention, each year about 10,000 babies born in the United States will develop cerebral palsy.

What are the Early Signs?

The **early signs** of cerebral palsy:

- Usually appear before a child reaches 3 years of age.
- Parents are often the first to suspect that their baby's motor skills aren't developing normally.
- Infants with cerebral palsy frequently have developmental delay, in which they are slow to reach developmental milestones such as learning to roll over, sit, crawl, smile, or walk.
- Some infants with cerebral palsy have abnormal muscle tone as infants.
- Decreased muscle tone (hypotonia) can make them appear relaxed, even floppy.
- Increased muscle tone (hypertonia) can make them seem stiff or rigid.
- In some cases, an early period of hypotonia will progress to hypertonia after the first 2 to 3 months of life.
- Children with cerebral palsy may also have unusual posture or favor one side of the body when they move.

What Causes Cerebral Palsy?

The majority of patients with cerebral palsy are born with it, although it may not be detected until months or years later. This is called **congenital cerebral palsy**. In the past, if doctors couldn't identify another cause, they attributed most cases of congenital cerebral palsy to problems or complications during labor that caused asphyxia (a lack of oxygen) during birth. However, extensive research by NINDS scientists and others has shown that **few babies who experience asphyxia during birth grow up to have cerebral palsy or any other neurological disorder**. Birth complications, including asphyxia, are now estimated to account for only 5 to 10 percent of the babies born with congenital cerebral palsy.

A small number of patients have **acquired cerebral palsy**, which means the disorder began after birth. In these cases, doctors can often pinpoint a specific reason for the problem, such as brain damage in the first few months or years of life, brain infections such as bacterial meningitis or viral encephalitis, or head injury from a motor vehicle accident, a fall, or child abuse.

What causes the remaining 90 to 95 percent? There are multiple reasons why cerebral palsy happens – as the result of genetic abnormalities, maternal infections or fevers, or fetal injury.

But in **all cases the disorder is the result of four types of brain damage** that cause its characteristic symptoms:

Damage to the white matter of the brain (periventricular leukomalacia [PVL]).	• The white matter is responsible for transmitting signals inside the brain and to the rest of the body. • PVL damage looks like tiny holes in the white matter of an infant's brain. • These gaps in brain tissue interfere with the normal transmission of signals. • There are a number of events that can cause PVL, including maternal or fetal infection. • White matter is particularly sensitive to insults and injury between 26 and 34 weeks of gestation.
Abnormal development of the brain (cerebral dysgenesis)	• Any interruption of the normal process of brain growth during fetal development can cause brain malformations that interfere with the transmission of brain signals. • The fetal brain is particularly vulnerable during the first 20 weeks of development. • Gene mutations, infections, fevers, trauma, or other conditions that cause unhealthy conditions in the womb all my effect brain development.

Bleeding in the brain (intracranial hemorrhage)	• Caused by blocked or broken blood vessels. • Some babies suffer a stroke while still in the womb because of blood clots in the placenta that block blood flow. Other types of fetal stroke are caused by malformed or weak blood vessels in the brain or by blood-clotting abnormalities. • Maternal hypertension or pelvic inflammatory disease may also cause fetal stroke.
Brain damage caused by a lack of oxygen in the brain (hypoxic-ischemic encephalopathy or intrapartum asphyxia)	• Caused by an interruption in breathing or poor oxygen supply, is common in babies due to the stress of labor and delivery. • Can also be caused by severe maternal low blood pressure, rupture of the uterus, detachment of the placenta, or problems involving the umbilical cord.

What are the Risk Factors?

If a mother or her baby has any of these risk factors, it doesn't mean that cerebral palsy is inevitable, but it does increase the chance for the kinds of brain damage that cause it.

Low birth weight and premature birth	• Higher among babies who weigh less than 5 ½ pounds at birth or are born less than 37 weeks. • Risk increases as birth weight falls or weeks of gestation shorten.
Multiple births	• Twins, triplets, and other multiple births – even those born at term – are linked to ↑ risk of cerebral palsy. • The death of a baby's twin or triplet further increases the risk.
Infections during pregnancy	• Inflammatory response to infection releases Cytokines (immune system cells). • Inflammation may cause central nervous system damage in an unborn baby.
Blood type incompatibility	• A mother's Rh blood type (either positive or negative) is different from the blood type of her baby. • Mother's body will begin to make antibodies that will attack and kill her baby's blood cells.
Exposure to toxic substances	• Exposure to toxic substances during pregnancy, such as methyl mercury, are at a heightened risk of having a baby with cerebral palsy.
Mothers with thyroid abnormalities, mental retardation, or seizures	• Mothers with any of these conditions are slightly more likely to have a child with cerebral palsy.

Warning signs of CP include:

Breech presentation	• Babies with cerebral palsy are more likely to be in a breech position (feet first) instead of head first at the beginning of labor.
Complicated labor and delivery	• A baby who has vascular or respiratory problems during labor and delivery may already have suffered brain damage or abnormalities.

Small for gestational age	• Risk because of factors that kept them from growing naturally in the womb.
Low Apgar score	• A low score at 10-20 minutes after delivery is often considered an important sign of potential problems such as cerebral palsy.
Jaundice	• Severe, untreated jaundice can cause a neurological condition known as kernicterus, which kills brain cells and can cause deafness and cerebral palsy.
Seizures	• An infant who has seizures faces a higher risk of being diagnosed later in childhood with cerebral palsy.

What are the Different Forms?

The specific forms of cerebral palsy are determined by the extent, type, and location of a patient's abnormalities. Classification is according to the type of movement disorder involved -- spastic (stiff muscles), athetoid (writhing movements), or ataxic (poor balance and coordination) -- plus any additional symptoms.

Spastic hemiplegia/hemiparesis	• Typically affects the arm and hand on one side of the body, but it can also include the leg. • Generally walk later and on tip-toe because of tight heel tendons. • May develop scoliosis or seizures. • Speech will be delayed. • Intelligence is usually normal.
Spastic diplegia/diparesis	• Muscle stiffness is predominantly in the legs and less severely affects the arms and face. • Hands may be clumsy. • Tendon reflexes are hyperactive. Toes point up. • Tightness in certain leg muscles makes the legs move like the arms of a scissor. • May require a walker or leg braces. • Intelligence and language skills are usually normal.
Spastic quadriplegia/quadriparesis	• Most severe form of cerebral palsy, often associated with moderate-to-severe mental retardation. • Caused by widespread damage to the brain or significant brain malformations. • Often have severe stiffness in their limbs but a floppy neck. • Hard to understand and be understood. • Seizures can be frequent and hard to control.
Dyskinetic cerebral palsy	• Characterized by slow and uncontrollable writhing movements of the hands, feet, arms, or legs. • In some patients, hyperactivity in the muscles of the face and tongue makes them grimace or drool. • Difficult to sit straight or walk. • Have problems coordinating the muscle movements required for speaking. • Intelligence is rarely affected.

Ataxic cerebral palsy	• Rare type of cerebral palsy affects balance and depth perception. • Often have poor coordination and walk unsteadily with a wide-based gait, placing their feet unusually far apart. • May also have intention tremor, in which a voluntary movement, such as reaching for a book, is accompanied by trembling that gets worse the closer their hand gets to the object.
Mixed types	• Common for patients to have symptoms that don't correspond to any single type of cerebral palsy.

What Other Conditions are Associated with Cerebral Palsy?

Many individuals will have no additional medical disorders. However, because cerebral palsy involves the brain and the brain controls so many of the body's functions, cerebral palsy can also cause:

Mental retardation	• Two-thirds of individuals with cerebral palsy will be intellectually impaired.
Seizure disorder	• As many as half of all patients with cerebral palsy have seizures.
Delayed growth and development	• A syndrome called failure to thrive is common in children with moderate-to-severe cerebral palsy, especially those with spastic quadriparesis. • Muscles and limbs affected by cerebral palsy tend to be smaller than normal.
Spinal deformities	• Curvature (scoliosis), humpback (kyphosis), and saddle back (lordosis). • Spinal deformities can make sitting, standing, and walking difficult and cause chronic back pain.
Impaired vision, hearing, or speech	• A large number of patients with cerebral palsy have strabismus, commonly called "cross eyes. • Untreated, this can lead to poor vision in one eye and can interfere with the ability to judge distance. • Patients with hemiparesis may have hemianopia,- defective vision or blindness that blurs the normal field of vision in one eye. • Hearing impairment is frequent. • More than a third have speech and language disorders.
Drooling	• Occurs because of have poor control of the muscles of the throat, mouth, and tongue.
Incontinence	• Caused by poor control of the muscles that keep the bladder closed. • Can take the form of bed-wetting, uncontrolled urination during physical activities, or slow leaking of urine throughout the day.
Abnormal sensations and perceptions	• May have difficulty feeling simple sensations, such as touch. • May have stereognosia, which makes it difficult to perceive and identify objects using only the sense of touch.

Coping with these disabilities may be even more of a challenge than coping with the motor impairments of cerebral palsy.

How Does a Doctor Diagnose Cerebral Palsy?

Doctors diagnose cerebral palsy by evaluating a motor skills and taking a careful and thorough look at their medical history. In addition to checking for the most characteristic symptoms -- slow development, abnormal muscle tone, and unusual posture -- a doctor also has to rule out other disorders that could cause similar symptoms. Most important, a doctor has to determine that the condition is not getting worse. Although symptoms may change over time, cerebral palsy by definition is not progressive. If a person is continuously losing motor skills, the problem more likely begins elsewhere – such as a genetic or muscle disease, metabolism disorder, or tumors in the nervous system. A comprehensive medical history, special diagnostic tests, and, in some cases, repeated check-ups can help confirm that other disorders are not at fault.

How is Cerebral Palsy Managed?

Cerebral palsy can't be cured, but treatment will often improve a person's capabilities. Many people go on to enjoy near-normal adult lives if their disabilities are properly managed. In general, the earlier treatment begins the better chance of overcoming developmental disabilities or learning new ways to accomplish the tasks that challenge them.

Addressing the needs of parents and caregivers is also an important component of the treatment plan. The well-being of an individual with cerebral palsy depends upon the strength and well-being of his or her family.

A comprehensive management plan will pull in a combination of health professionals with expertise in the following:

Physical therapy	• To improve walking and gait, stretch spastic muscles, and prevent deformities from contractures. • **Resistive exercise programs** (also called strength training) and other types of exercise are often used to increase muscle performance, especially in children and adolescents with mild cerebral palsy.
Occupational therapy	• To develop compensating tactics for everyday activities such as dressing, going to school, and participating in day-to-day activities. • Helps master the basic activities of daily living, such as eating, dressing, and using the bathroom alone.
Speech therapy	• To address swallowing disorders, speech impediments, and other obstacles to communication.
Counseling and behavioral therapy	• To address emotional and psychological needs and help children and their families cope emotionally with their disabilities.
Drugs	• To control seizures, relax muscle spasms, and alleviate pain.
Surgery	• To correct anatomical abnormalities or release tight muscles.
Braces and other orthotic devices	• To compensate for muscle imbalance, improve posture and walking, and increase independent mobility.
Mechanical aids	• Such as wheelchairs and rolling walkers for individuals who are not independently mobile.
Communication aids	• Such as computers, voice synthesizers, or symbol boards to allow severely impaired individuals to communicate with others.

Recreational therapies. Recreational therapies, such as therapeutic horseback riding (also called hippotherapy), are sometimes used with the mildly impaired to improve gross motor skills. Parents of children who participate in recreational therapies usually notice an improvement in their child's speech, self-esteem, and emotional well-being.

Controversial physical therapies.

1. "Patterning" is a physical therapy based on the principle that children with cerebral palsy should be taught motor skills in the same sequence in which they develop in normal children. In this controversial approach, the therapist begins by teaching a child elementary movements such as crawling -- regardless of age – before moving on to walking skills. Some experts and organizations, including the American Academy of Pediatrics, have expressed strong reservations about the patterning approach because studies have not documented its value.

2. Bobath technique (which is also called "neurodevelopmental treatment"). In this form of physical therapy, instructors inhibit abnormal patterns of movement and encourage more normal movements. The Bobath technique has had a widespread influence on the core physical therapies of cerebral palsy treatment, but there is no evidence that the technique improves motor control. The American Academy of Cerebral Palsy and Developmental Medicine reviewed studies that measured the impact of neurodevelopmental treatment and concluded that there was no strong evidence supporting its effectiveness for children with cerebral palsy.

3. Conductive education is another physical therapy that at one time appeared to hold promise. Conductive education instructors attempt to improve a child's motor abilities by combining rhythmic activities, such as singing and clapping, with physical maneuvers on special equipment. The therapy, however, has not been able to produce consistent or significant improvements in study groups.

Treatments for problems with eating and drooling are often necessary when patients with cerebral palsy have difficulty eating and drinking because they have little control over the muscles that move their mouth, jaw, and tongue putting them at risk for breathing food or fluid into the lungs. Some patients develop gastroesophageal reflux disease (GERD, commonly called heartburn) in which a weak diaphragm can't keep stomach acids from spilling into the esophagus. The irritation of the acid can cause bleeding and pain. Individuals with cerebral palsy are also at risk for malnutrition.

Treatments:

- Tube feeding either via naso-gastric tube or gastrostomy.
- Anticholinergic drugs – such as glycopyrolate -- can reduce the flow of saliva but may cause unpleasant side effects, such as dry mouth, constipation, and urinary retention.
- Surgery, while sometimes effective, carries the risk of complications.
- Some benefit from biofeedback techniques that help them recognize more quickly when their mouths fall open and they begin to drool.
- Intraoral devices (devices that fit into the mouth) that encourage better tongue positioning and swallowing are still being evaluated, but appear to reduce drooling.

Drug Treatments

Oral medications	• Usually used as the first line of treatment to relax stiff, contracted, or overactive muscles. • Diazepam, baclofen, dantrolene sodium, and tizanidine. • Easy to use, dosages high enough to be effective often have side effects, among them drowsiness, upset stomach, high blood pressure, and possible liver damage with long-term use. • Most appropriate for those who need only mild reduction in muscle tone or who have widespread spasticity.

Botulinum toxin (BT-A)*	• Injected locally, has become a standard treatment for overactive muscles. • Relaxes contracted muscles by keeping nerve cells from over-activating muscle. • Lasts about 3 months; undesirable side effects are mild and short-lived (injection site pain, mild flu-like symptoms). • Works best for those who have some control over their motor movements and have a limited number of muscles to treat, none of which is fixed or rigid.
Intrathecal baclofen	• Uses an implantable pump to deliver baclofen, a muscle relaxant, into the fluid surrounding the spinal cord. • Decreases the excitability of nerve cells in the spinal cord, which then reduces muscle spasticity throughout the body. • Intrathecal dose can be as low as 1/100th of the oral dose. • The pump is the size of a hockey puck and is implanted in the abdomen. It contains a refillable reservoir connected to an alarm that beeps when the reservoir is low. • As a muscle-relaxing therapy, is most appropriate for individuals with chronic, severe stiffness or uncontrolled muscle movement throughout the body. • Undesirable, but infrequent, side effects include overrelaxation of the muscles, sleepiness, headache, nausea, vomiting, dizziness, and constipation.

*Because BT-A does not have FDA approval to treat spasticity in children, parents and caregivers should make sure that the doctor giving the injection is trained in the procedure and has experience using it in children.

Assistive Technology

Devices that help individuals move about more easily and communicate successfully at home, at school, or in the workplace can help a child or adult with cerebral palsy overcome physical and communication limitations. There are a number of devices that help individuals stand straight and walk, such as postural support or seating systems, open-front walkers, quadrapedal canes (lightweight metal canes with four feet), and gait poles. Electric wheelchairs let more severely impaired adults and children move about successfully.

The computer is probably the most dramatic example of a communication device that can make a big difference in the lives of people with cerebral palsy. Equipped with a computer and voice synthesizer, a child or adult with cerebral palsy can communicate successfully with others. For example, a child who is unable to speak or write but can make head movements may be able to control a computer using a special light pointer that attaches to a headband.

Alternative Therapies

Therapeutic (subthreshold) electrical stimulation, also called neuromuscular electrical stimulation (NES), pulses electricity into the motor nerves to stimulate contraction in selective muscle groups. Many studies have demonstrated that NES appears to increase range of motion and muscular strength.

Threshold electrical stimulation, which involves the application of electrical stimulation at an intensity too low to stimulate muscle contraction, is a controversial therapy. Studies have not been able to demonstrate its effectiveness or any significant improvement with its use.

Hyperbaric oxygen therapy. Some children have cerebral palsy as the result of brain damage from oxygen deprivation. Proponents of hyperbaric oxygen therapy propose that the brain tissue surrounding the damaged area can be "awakened" by forcing high concentrations of oxygen into the body under greater than atmospheric pressure.

A recent study compared a group of children who received no hyperbaric treatment to a group that received 40 treatments over 8 weeks. On every measure of function (gross motor, cognitive, communication, and memory) at the end of 2 months of treatment and after a further 3 months of follow-up, the two groups were identical in outcome. There was no added benefit from hyperbaric oxygen therapy.

Adults with Cerebral Palsy: Special Health Challenges

Before the mid-twentieth century, few children with cerebral palsy survived to adulthood. Now, because of improvements in medical care, rehabilitation, and assistive technologies, 65 to 90 percent of children with cerebral palsy live into their adult years. This increase in life expectancy is often accompanied by a rise in medical and functional problems – some of them beginning at a relatively early age – including the following:

Premature aging because of the extra stress and strain the disease puts upon their bodies. The developmental delays that often accompany cerebral palsy keep some organ systems from developing to their full capacity and level of performance. As a consequence, organ systems such as the cardiovascular system (the heart, veins, and arteries) and pulmonary system (lungs) have to work harder and they age prematurely.

Functional issues at work. The day-to-day challenges of the workplace are likely to increase as an employed individual with cerebral palsy reaches middle age. Some individuals will be able to continue working with accommodations such as an adjusted work schedule, assistive equipment, or frequent rest periods. Early retirement may be necessary for others.

Depression. Mental health issues can also be of concern as someone with cerebral palsy grows older. The rate of depression is three to four times higher in people with disabilities such as cerebral palsy. It appears to be related not so much to the severity of their disabilities, but to how well they cope with them. The amount of emotional support someone has, how successful they are at coping with disappointment and stress, and whether or not they have an optimistic outlook about the future all have a significant impact on mental health.

Post-impairment syndrome. Most adults with cerebral palsy experience what is called post-impairment syndrome, a combination of pain, fatigue, and weakness due to muscle abnormalities, bone deformities, overuse syndromes (sometimes also called repetitive motion injuries), and arthritis. Fatigue is often a challenge, since individuals with cerebral palsy use three to five times the amount of energy that able-bodied people use when they walk and move about.

Osteoarthritis and degenerative arthritis. Musculoskeletal abnormalities that may not produce discomfort during childhood can cause pain in adulthood. For example, the abnormal relationships between joint surfaces and excessive joint compression can lead to the early development of painful osteoarthritis and degenerative arthritis. Individuals with cerebral palsy also have limited strength and restricted patterns of movement, which puts them at risk for overuse syndromes and nerve entrapments.

Pain. Issues related to pain often go unrecognized by health care providers since individuals with cerebral palsy may not be able to describe the extent or location of their pain. Pain can be acute or chronic, and is experienced most commonly in the hips, knees, ankles, and the upper and lower back. Individuals with spastic cerebral palsy have an increased number of painful sites and worse pain than those with other types of cerebral palsy. The best treatment for pain due to musculoskeletal abnormalities is preventive – correcting skeletal and muscle abnormalities early in life to avoid the progressive accumulation of stress and strain that causes pain. Dislocated hips, which are particularly likely to cause pain, can be surgically repaired. If it is managed properly, pain does not have to become a chronic condition.

Other medical conditions. Adults have higher than normal rates of other medical conditions secondary to their cerebral palsy, such as hypertension, incontinence, bladder dysfunction, and swallowing difficulties. Curvature of the spine (scoliosis) is likely to progress after puberty, when bones have matured into their final shape and size. People with cerebral palsy also have a higher incidence of bone fractures, occurring most frequently during physical therapy sessions. A combination of mouth breathing, poor hygiene, and abnormalities in tooth enamel increase the risk of cavities and periodontal disease. Twenty-five percent to 39 percent of adults with cerebral palsy have vision problems; eight to 18 percent have hearing problems. Because many individuals with cerebral palsy outlive their primary caregiver, the issue of long-term care and support should be taken into account and planned for.

Glossary of Terms

acquired cerebral palsy — cerebral palsy that occurs as a result of injury to the brain after birth or during early childhood.
Apgar score — a numbered scoring system doctors use to assess a baby's physical state at the time of birth.
anticholinergic drugs — a family of drugs that inhibit parasympathetic neural activity by blocking the neurotransmitter acetylcholine.
asphyxia — a lack of oxygen due to trouble with breathing or poor oxygen supply in the air.
ataxia (ataxic) — the loss of muscle control.
athetoid — making slow, sinuous, involuntary, writhing movements, especially with the hands.
bilirubin — a bile pigment produced by the liver of the human body as a byproduct of digestion.
bisphosphonates — a family of drugs that strengthen bones and reduce the risk of bone fracture in elderly adults.
botulinum toxin — a drug commonly used to relax spastic muscles; it blocks the release of acetylcholine, a neurotransmitter that energizes muscle tissue.
cerebral — relating to the two hemispheres of the human brain.
cerebral dysgenesis — defective brain development.
chemodenervation — a treatment that relaxes spastic muscles by interrupting nerve impulse pathways via a drug, such as botulinum toxin, which prevents communication between neurons and muscle tissue.
choreoathetoid — a condition characterized by aimless muscle movements and involuntary motions.
computed tomography (CT) scan — an imaging technique that uses X-rays and a computer to create a picture of the brain's tissues and structures.
congenital cerebral palsy — cerebral palsy that is present at birth from causes that have occurred during fetal development.
contracture — a condition in which muscles become fixed in a rigid, abnormal position, which causes distortion or deformity.
cytokines — messenger cells that play a role in the inflammatory response to infection.
developmental delay — behind schedule in reaching the milestones of early childhood development.
disuse atrophy — muscle wasting caused by the inability to flex and exercise muscles.
dyskinetic — the impairment of the ability to perform voluntary movements, which results in awkward or incomplete movements.
dystonia (dystonic) — a condition of abnormal muscle tone.
electroencephalogram (EEG) — a technique for recording the pattern of electrical currents inside the brain.
electromyography — a special recording technique that detects muscle activity.
failure to thrive — a condition characterized by a lag in physical growth and development.
focal (partial) seizure — a brief and temporary alteration in movement, sensation, or autonomic nerve function caused by abnormal electrical activity in a localized area of the brain.
gait analysis — a technique that uses cameras, force plates, electromyography, and computer analysis to objectively measure an individual's pattern of walking.
gastroesophageal reflux disease (GERD) — also known as heartburn, which happens when stomach acids back up into the esophagus.
gastrostomy — a surgical procedure that creates an artificial opening in the stomach for the insertion of a feeding tube.
gestation — the period of fetal development from the time of conception until birth.
hemianopia — defective vision or blindness that impairs half of the normal field of vision.
hemiparesis — paralysis affecting only one side of the body.
homonymous — having the same description, name, or term.
hypertonia — increased muscle tone.
hypotonia — decreased muscle tone.
hypoxic-ischemic encephalopathy — brain damage caused by poor blood flow or insufficient oxygen supply to the brain.
intracranial hemorrhage — bleeding in the brain.

intrapartum asphyxia — the reduction or total stoppage of oxygen circulating in a baby's brain during labor and delivery.
intrathecal baclofen — baclofen that is injected into the cerebrospinal fluid of the spinal cord to reduce spasticity.
intrauterine infection — infection of the uterus, ovaries, or fallopian tubes (see pelvic inflammatory disease for a more detailed explanation).
jaundice — a blood disorder caused by the abnormal buildup of bilirubin in the bloodstream.
kernicterus — a neurological syndrome caused by deposition of bilirubin into brain tissues. Kernicterus develops in extremely jaundiced infants, especially those with severe Rh incompatibility.
kyphosis — a humpback-like outward curvature of the upper spine.
lordosis — an increased inward curvature of the lower spine.
magnetic resonance imaging (MRI) — an imaging technique that uses radio waves, magnetic fields, and computer analysis to create a picture of body tissues and structures.
nerve entrapment — repeated or prolonged pressure on a nerve root or peripheral nerve.
neuronal migration — the process in the developing brain in which neurons migrate from where they are born to where they settle into neural circuits. Neuronal migration, which occurs as early as the second month of gestation, is controlled in the brain by chemical guides and signals.
neuroprotective — describes substances that protect nervous system cells from damage or death.
neurotrophins — a family of molecules that encourage survival of nervous system cells.
off-label drugs — drugs prescribed to treat conditions other than those that have been approved by the Food and Drug Administration.
orthotic devices — special devices, such as splints or braces, used to treat posture problems involving the muscles, ligaments, or bones.
osteopenia — reduced density and mass of the bones.
overuse syndrome (also called repetitive strain injury) — a condition in which repetitive movements or constrained posture cause nerve and muscle damage, which results in discomfort or persistent pain in muscles, tendons, and other soft tissues. This can happen in various parts of the body, but is most likely to happen in the arms, legs, or hands.
palsy — paralysis, or the lack of control over voluntary movement.
-paresis or -plegia — weakness or paralysis. In cerebral palsy, these terms are typically combined with other phrases that describe the distribution of paralysis and weakness; for example, quadriplegia means paralysis of all four limbs.
pelvic inflammatory disease (PID, also sometimes called pelvic infection or intrauterine infection) — an infection of the upper genital tract (the uterus, ovaries, and fallopian tubes) caused by sexually transmitted infectious microorganisms. Symptoms of PID include fever, foul-smelling vaginal discharge, abdominal pain and pain during intercourse, and vaginal bleeding. Many different organisms can cause PID, but most cases are associated with gonorrhea and chlamydia.
periventricular leukomalacia (PVL) — "peri" means near; "ventricular" refers to the ventricles or fluid spaces of the brain; and "leukomalacia" refers to softening of the white matter of the brain. PVL is a condition in which the cells that make up white matter die near the ventricles. Under a microscope, the tissue looks soft and sponge-like.
placenta — an organ that joins a mother with her unborn baby and provides nourishment and sustenance.
post-impairment syndrome — a combination of pain, fatigue, and weakness due to muscle abnormalities, bone deformities, overuse syndromes, or arthritis.
quadriplegia — paralysis of both the arms and legs.
respite care — rest or relief from caretaking obligations.
Rh incompatibility — a blood condition in which antibodies in a pregnant woman's blood attack fetal blood cells and impair an unborn baby's supply of oxygen and nutrients.
rubella — (also known as German measles) a viral infection that can damage the nervous system of an unborn baby if a mother contracts the disease during pregnancy.
scoliosis — a disease of the spine in which the spinal column tilts or curves to one side of the body.
selective dorsal rhizotomy — a surgical procedure in which selected nerves are severed to reduce spasticity in the legs.

selective vulnerability — a term that describes why some neurons are more vulnerable than others to particular diseases or conditions. For example, motor neurons are selectively vulnerable to the loss or reduction in levels of the neurotransmitter dopamine, which results in the weakness and paralysis of amyotrophic lateral sclerosis (ALS, commonly called Lou Gehrig's disease).
spastic (or spasticity) — describes stiff muscles and awkward movements.
spastic diplegia (or diparesis) — a form of cerebral palsy in which spasticity affects both legs, but the arms are relatively or completely spared.
spastic hemiplegia (or hemiparesis) — a form of cerebral palsy in which spasticity affects an arm and leg on one side of the body.
spastic quadriplegia (or quadriparesis) — a form of cerebral palsy in which all four limbs are paralyzed or weakened equally.
stereognosia — difficulty perceiving and identifying objects using the sense of touch.
strabismus — misalignment of the eyes, also known as cross eyes.
telemetry wand — a hand-held device that acts as a remote control, directing the dosing level of a drug via a pump implanted beneath the skin.
tonic-clonic seizure — a type of seizure that results in loss of consciousness, generalized convulsions, loss of bladder control, and tongue biting followed by confusion and lethargy when the convulsions end.
tremor — an involuntary trembling or quivering.
ultrasound — a technique that bounces sound waves off tissue and bone and uses the pattern of echoes to form an image, called a sonogram.

Adapted (8-07) from: "Cerebral Palsy: Hope Through Research," NINDS. Publication date July 2006. NIH Publication No. 06-159 Last updated June 26, 2007

Chronic Obstructive Pulmonary Disease (COPD)

Definition

COPD is a lung disease in which the lungs are damaged, making it hard to breathe. In COPD, the airways—the tubes that carry air in and out of your lungs—are partly obstructed, making it difficult to get air in and out. In the U.S., COPD includes emphysema and chronic bronchitis.

Characteristics

Cigarette smoking is the most common cause of COPD. Most people with COPD are smokers or former smokers. Breathing in other kinds of lung irritants, like pollution, dust, or chemicals, over a long period of time may also cause or contribute to COPD.

The signs and symptoms of COPD include:

- cough
- sputum (mucus) production
- shortness of breath, especially with exercise
- wheezing (a whistling or squeaky sound when you breathe)
- chest tightness

Extreme weakness and loss of exercise tolerance is an outcome of COPD.

Functional Considerations

- Because symptoms usually don't appear until the later stages of COPD, most diagnosed patients will have functional limitations.
- Functional limitations are most often related to exercise intolerance and shortness of breath.
- Spacing activities and conserving energy are helpful in maximizing functional abilities.
- The consumer will probably need to avoid exertion. For some consumers, even getting dressed may be too exerting.
- If the consumer uses oxygen continuously, s/he may be able to reheat meals prepared in advance in a microwave.
- The condition will become worse over time.

National Heart Lung and Blood Institute

COPD

What is COPD?

Chronic obstructive pulmonary disease (COPD) is a lung disease in which the lungs are damaged, making it hard to breathe. In COPD, the airways—the tubes that carry air in and out of your lungs—are partly obstructed, making it **difficult to get air in and out.**

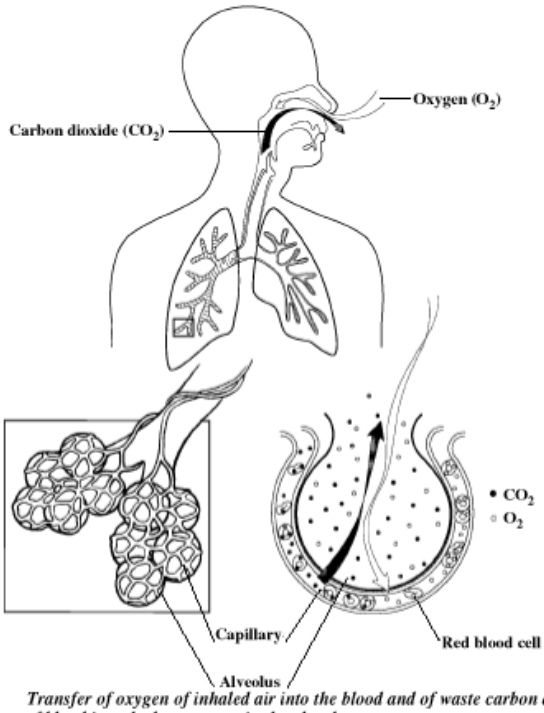
Cigarette smoking is the most common cause of COPD. Most people with COPD are smokers or former smokers. Breathing in other kinds of lung irritants, like pollution, dust, or chemicals, over a long period of time may also cause or contribute to COPD.

The airways branch out like an upside-down tree, and at the end of each branch are many small, balloon-like air sacs. In healthy people, each airway is clear and open. The air sacs are small and dainty, and both the airways and air sacs are elastic and springy. When you breathe in, each air sac fills up with air like a small balloon; when you breathe out, the balloon deflates and the air goes out.

In COPD, the airways and air sacs lose their shape and become floppy. Less air gets in and less air goes out because:

- The airways and air sacs lose their elasticity (like an old rubber band).
- The walls between many of the air sacs are destroyed.
- The walls of the airways become thick and inflamed (swollen).
- Cells in the airways make more mucus (sputum) than usual, which tends to clog the airways.

COPD develops slowly, and it may be many years before symptoms like feeling short of breath are noticed. Most of the time, COPD is diagnosed in middle-aged or older people.



Transfer of oxygen of inhaled air into the blood and of waste carbon dioxide of blood into the lungs occur in the alveolus.

COPD is a major cause of death and illness, and it is the fourth leading cause of death in the United States and throughout the world.

There is no cure for COPD. The damage to your airways and lungs cannot be reversed, but there are things you can do to feel better and slow the damage.

COPD is not contagious—you cannot catch it from someone else.

Other names for COPD:

- Chronic obstructive airway disease
- Chronic obstructive lung disease

In the United States, chronic obstructive pulmonary disease (COPD) includes:

- Emphysema
- Chronic bronchitis

In the **emphysema** type of COPD, the walls between many of the air sacs are destroyed, leading to a few large air sacs instead of many tiny ones. Consequently, the lung looks like a sponge with many large bubbles or holes in it, instead of a sponge with very tiny holes. The large air sacs have less surface area for the exchange of oxygen and carbon dioxide than healthy air sacs. Poor exchange of the oxygen and carbon dioxide causes shortness of breath.

In chronic bronchitis, the airways have become inflamed and thickened, and there is an increase in the number and size of mucus-producing cells. This results in excessive mucus production, which in turn contributes to cough and difficulty getting air in and out of the lungs.

Most people with COPD have both chronic bronchitis and emphysema.

What Causes COPD?

Most cases of chronic obstructive pulmonary disease (COPD) develop after repeatedly breathing in things over a long period of time that irritate and damage the lungs and airways. **The lungs and airways are highly sensitive to these irritants.** They cause the airways to become inflamed and narrowed, and they destroy the elastic fibers that allow the lung to stretch and then return to its resting shape. This makes breathing air in and out of the lungs more difficult.

Common irritants:

- Cigarette smoking
- Pipe
- cigar
- Other types of tobacco smoke
- fumes
- dusts
- air pollution
- secondhand smoke

Smoking is the most common cause of COPD.

Genes—may play a role in developing COPD. In rare cases, COPD is caused by a gene-related disorder called alpha 1 antitrypsin deficiency. Alpha 1 antitrypsin (an-te-TRIP-sin) is a protein in your blood that inactivates destructive proteins. The imbalance of proteins leads to the destruction of the lungs and COPD. If people with this condition smoke, the disease progresses more rapidly.

Who is At Risk for COPD?

Most people with chronic obstructive pulmonary disease (COPD) are:

- **Smokers** or were smokers in the past.
- People with a **family history of COPD** are more likely to get the disease if they smoke.
- The chance of developing COPD is also greater in people who have spent **many years in contact with lung irritants**, for example, farm laborers with constant contact with dusts.
- A person who has had **frequent and severe lung infections**, especially during childhood, may have a greater chance of developing lung damage that can lead to COPD. Fortunately, this is much less common today with antibiotic treatments.

Most people with COPD are at least 40 years old or around middle age when symptoms start. It is unusual, but possible, for people younger than 40 years of age to have COPD.

National Heart Lung and Blood Institute

What are the Signs and Symptoms of COPD?

The signs and symptoms of chronic obstructive pulmonary disease (COPD) include:

- Cough
- Sputum (mucus) production
- Shortness of breath, especially with exercise
- Wheezing (a whistling or squeaky sound when you breathe)
- Chest tightness

A cough that doesn't go away and coughing up lots of mucus are common signs of COPD. These often occur years before the flow of air in and out of the lungs is reduced. However, not everyone with a cough and sputum production goes on to develop COPD, and not everyone with COPD has a cough.

The severity of the symptoms depends on how much of the lung has been destroyed. If you continue to smoke, the lung destruction is faster than if you stop smoking.

How is COPD Diagnosed?

Doctors consider a diagnosis of chronic obstructive pulmonary disease (COPD) if the patient has the typical symptoms and a history of exposure to lung irritants, especially cigarette smoking. A medical history, physical exam, and breathing tests are the most important tests to determine a COPD diagnosis.

The doctor will complete an examination including listening to the lungs, and ask questions about family and medical history and what lung irritants may have been around for long periods of time.

In addition, the doctor will use a breathing test called **spirometry** to confirm a diagnosis of COPD. This test is easy and painless and shows how well the lungs work. The patient breathes hard into a large hose connected to a machine called a spirometer. When they exhale, the spirometer measures:

1. how much air the lungs can hold and
2. how fast the patient can blow air out of the lungs after taking a deep breath.

Spirometry is the most sensitive and commonly used test of lung functions. It can detect COPD long before there are significant symptoms.
Based on this test, the doctor can determine if a person has COPD and how severe it is.

Doctors classify the severity of COPD as:

At risk (for developing COPD)	• Breathing test is normal. • Mild signs that include a chronic cough and sputum production.
Mild COPD	• Breathing test shows mild airflow limitation. • Signs may include a chronic cough and sputum production. • At this stage, the patient you may not be aware that the airflow in their lungs is reduced.
Moderate COPD	• Breathing test shows a worsening airflow limitation. Usually the signs have increased. • Shortness of breath usually develops when working hard, walking fast, or doing other brisk activities. • At this stage, a person usually seeks medical attention.
Severe COPD	• Breathing test shows severe airflow limitation. • A person is short of breath after just a little activity. • In very severe COPD, complications like respiratory failure or signs of heart failure may develop. • At this stage, the quality of life is greatly impaired and the worsening symptoms may be life threatening.

The doctor may also recommend tests to rule out other causes of your signs and symptoms.

How is COPD Treated?

The **goals** of COPD treatment are to:

- Relieve symptoms with no or minimal side effects of treatment
- Slow the progress of the disease
- Improve exercise tolerance (the ability to stay active)
- Prevent and treat complications and sudden onset of problems
- Improve overall health

The doctor will recommend treatments that help relieve symptoms and help to breathe easier. However, COPD cannot be cured.

Quitting smoking is the single most important thing that can be done do to reduce risk of developing chronic obstructive pulmonary disease (COPD) and slow the progress of the disease.

The treatment for COPD is different for each person. Usually the COPD patient will be under the care of a lung specialist (pulmonologist).

Treatment is based on whether symptoms are mild, moderate, or severe.

Medicines and pulmonary rehabilitation (rehab) are often used to help relieve your symptoms and to help you breathe more easily and stay active.

COPD Medicines

Bronchodilators	• Work by relaxing the muscles around your airways. • Helps to open airways quickly and make breathing easier. • Short-acting bronchodilators last about 4 to 6 hours and are used only when needed – used for mild COPD. • Long-acting bronchodilators last about 12 hours or more and are used every – used for moderate or severe COPD. • A combination of long and short acting may also be used. • Most are inhaled, so they go directly into the lungs where they are needed.
Inhaled glucocorticosteroids (steroids)	• Are used for some people with moderate or severe COPD. • Work to reduce airway inflammation. • The patient may use for several weeks as a trial to see if it helps. • These are long acting.

Other Treatments

Flu shots	• The flu (influenza) can cause serious problems in people with COPD. • Flu shots can reduce the chance of getting the flu. COPD patients should get a flu shot every year.
Pneumococcal vaccine	• This vaccine should be administered to those with COPD to prevent a common cause of pneumonia. • Revaccination may be necessary after 5 years in those older than 65 years of age.

Pulmonary Rehabilitation	• A coordinated program of exercise, disease management training, and counseling that can help the patient with COPD stay more active and carry out day-to-day activities. • May include exercise training, nutrition advice, education about your disease and how to manage it, and counseling.
Oxygen Treatment	• May need extra oxygen all the time or some of the time some people with severe COPD may need extra oxygen for more than 15 hours a day. • Benefits include: o help do tasks or activities with less shortness of breath o protect the heart and other organs from damage o sleep more during the night and improve alertness during the day o live longer
Surgery	• Surgery is usually done for people who have: o Severe symptoms o Not had improvement from taking medicines o A very hard time breathing most of the time
Bullectomy	• Surgeons remove one or more very large bullae from the lungs of people who have emphysema. • Bullae are air spaces that are formed when the walls of the air sacs break. • The air spaces can become so large that they interfere with breathing.
Lung volume reduction surgery (LVRS).	• Surgeons remove sections of damaged tissue from the lungs of patients with emphysema. • Can help improve exercise capacity and daily functioning.
Lung transplant	• May be done for some people with very severe COPD. • A transplant involves removing the lung of a person with COPD and replacing it with a healthy lung from a donor.

Living with COPD

Although there is no cure for chronic obstructive pulmonary disease (COPD), symptoms can be managed, and damage to the lungs can be slowed. The most important thing to do is to quit smoking. It is also important to stay away from people who are smoking or places where there is smoking.

It is important to have clean air in the home. The following are some things that may help:

- Keep smoke, fumes, and strong smells out of the home.
- Stay away from home if it is being painted or sprayed for insects.
- Cook near an open door or window.
- If using wood or kerosene to heat the home, keep a door or window open.
- Keep windows closed and stay at home when there is a lot of pollution or dust outside.

Take medications as ordered and make to refill them prior to running out.

See the doctor at least two times a year, even if when feeling fine. Take a list of currant medications to each doctor visit.

Ask about getting a flu shot and pneumonia vaccination.

To keep the body strong, learn breathing exercises and walk and exercise regularly.

Eat healthy foods. Eat lots of fruits and vegetables. Eat protein food like meat, fish, eggs, milk, and soy.

Following are some things that the patient can do to get the most out of each breath make life as easy as possible at home by:

- Asking friends and family for help.
- Doing things slowly.
- Doing things sitting down.
- Putting things that will be needed in one place that is easy to reach.
- Finding very simple ways to cook, clean, and do other chores. Some people use a small table or cart with wheels to move things around. Using a pole or tongs with long handles can help you reach things.
- Keeping clothing loose.
- Wearing clothes and shoes that are easy to put on and take off.
- Asking for help moving things around in the house to avoid the need to climb stairs as often.
- Picking an enjoyable place to sit and visit with others.

Managing Complications and Preventing Sudden Onset of Problems

People with chronic obstructive pulmonary disease (COPD) often have symptoms that suddenly get worse. When this happens, they have a much harder time catching their breath. The patient may also have chest tightness, more coughing, change in sputum, and a fever. It is important to call the doctor if any of these signs or symptoms are present.

Seek emergency help if:

- It is hard to talk or walk.
- Heart rate is very fast or irregular.
- Lips or fingernails are gray or blue.
- Breathing is fast and hard, even when using normal medicines.
- There is a change in mental condition.

Adapted (8-07) from: NHLBI http://www.nhlbi.nih.gov/health/dci/Diseases/Copd/Copd_WhatIs.html, publication date January 2006.

DATA FACT SHEET

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
National Institutes of Health
National Heart, Lung, and Blood Institute

National Heart, Lung, and Blood Institute

CHRONIC OBSTRUCTIVE PULMONARY DISEASE

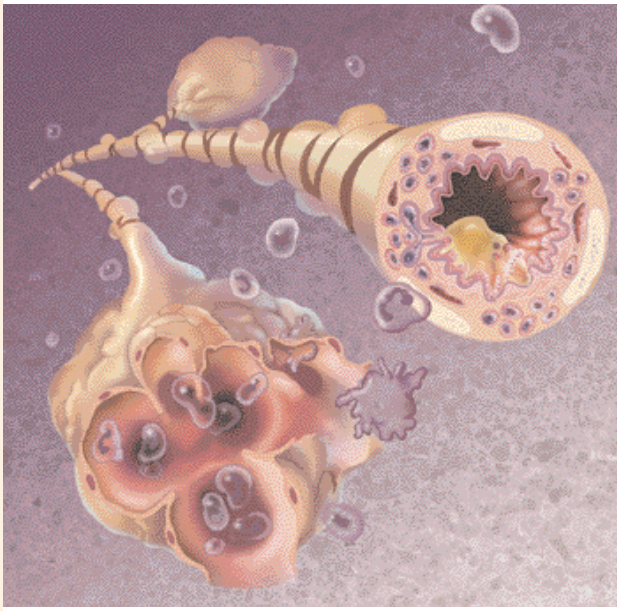
Chronic Obstructive Pulmonary Disease (COPD) is a slowly progressive disease of the airways that is characterized by a gradual loss of lung function. In the U.S., the term COPD includes chronic bronchitis, chronic obstructive bronchitis, or emphysema, or combinations of these conditions. It represents the fourth leading cause of death in the U.S.

The symptoms of COPD can range from chronic cough and sputum production to severe disabling shortness of breath. In some individuals, chronic cough and sputum production are the first signs that they are at risk for developing the airflow obstruction and shortness of breath characteristic of COPD. In others, shortness of breath may be the first indication of the disease.

In the U.S., the most important risk factor for COPD by far is cigarette smoking. Pipe, cigar, other types of tobacco smoking, and passive exposure to cigarette smoke are also risk factors. Other documented causes of COPD include occupational dusts and chemicals. Outdoor air pollution adds to the total burden of inhaled particles in the lungs, but its role in causing COPD is uncertain. The most important measure for preventing COPD – and for stopping disease progression – is avoidance of smoking.

The diagnosis of COPD is confirmed by the presence of airway obstruction on testing with spirometry. There is no known cure for COPD at the present time. Treatment is usually supportive and designed to relieve symptoms and improve quality of life.

With continued exposure to cigarettes or noxious particles, the disease progresses and individuals with COPD increasingly lose their ability to breathe. Acute infections or certain weather conditions may temporarily worsen symptoms (exacerbations), occasionally where hospitalization may be required.



COPD FACTS

Prevalence

- 12.1 million adults ages 25 and older reported being diagnosed with COPD in 2001.
- About 24 million adults have evidence of impaired lung function indicating that COPD is underdiagnosed.
- The prevalence of self-reported COPD is higher in females than males and in whites than blacks.

Mortality

- About 119,000 adults ages 25 and older died from COPD in 2000.
- While the COPD death rate for females more than doubled between 1980 and 2000, and the number of deaths for females surpassed the number for males in 2000, the overall age-adjusted death rate for COPD remained higher for males in 2000. The age-adjusted COPD death rate was about 46 percent higher in males than females and 63 percent higher in whites than blacks.
- COPD is the fourth leading cause of death in the U.S. and is projected to be the third leading cause of death for both males and females by the year 2020.

Emergency Department Visits and Hospitalizations

- About 1.5 million emergency department visits by adults 25 and older were made for COPD in 2000.
- More emergency department visits for COPD were made by adult females than adult males (898,000 vs. 651,000).
- About 726,000 hospitalizations for COPD occurred in 2000. More females than males were hospitalized for COPD (404,000 vs. 322,000).

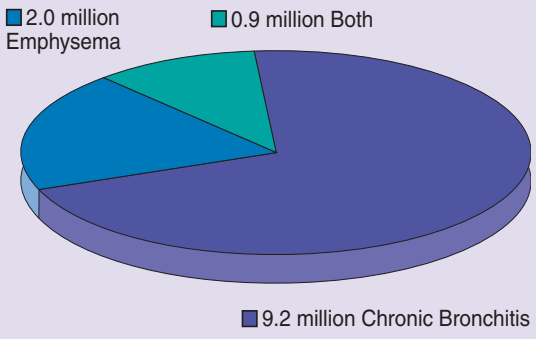
Costs

- The total estimated cost of COPD in 2002 was $32.1 billion.
  - $18 billion direct costs
  - $14.1 billion indirect costs

PREVALENCE OF COPD

In 1997, the survey questions used to determine the prevalence of COPD in the U.S. changed. Prior to 1997, the prevalence was based on individuals who had, or knew someone in the family who had, chronic bronchitis or emphysema during the past 12 months. The new survey asks, "During the past 12 months, have you been told by a doctor or other health professional that you have chronic bronchitis?"; and "Have you ever been told by a doctor or other health professional that you have emphysema?" Based on these questions, during 2001, 12.1 million U.S. adults 25 years and older reported having COPD (figure 1).[1] In addition, millions may be unaware that they have COPD because they have minimal or no symptoms. Therefore, COPD may be underdiagnosed.

Figure 1 *Prevalence of Chronic Obstructive Pulmonary Disease, 25 Years and Older, U.S., 2001*

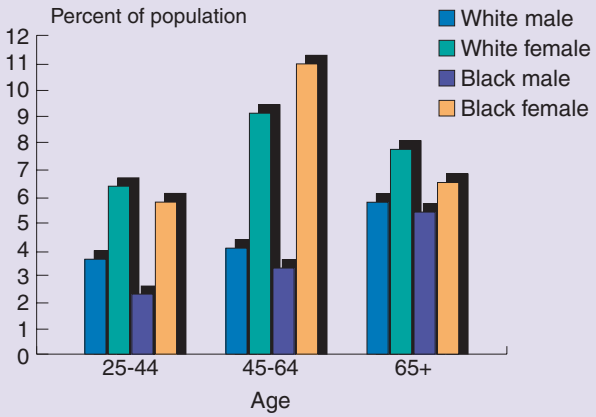


Source: National Health Interview Survey, CDC, NCHS

CHRONIC BRONCHITIS

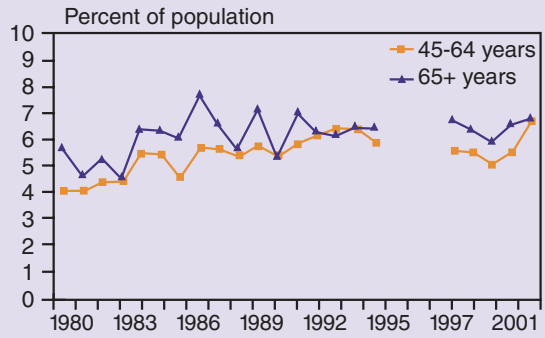
In 2001, the prevalence of chronic bronchitis was lowest among the 25-44 age group. Across age groups, females had higher rates than males for both races. Among the 25-44 and 65 and older age groups, prevalence was higher for whites than blacks for each sex group. For the 45-64 age group, chronic bronchitis was higher among females, and black females in particular, had the highest prevalence for this age group (figure 2). From 1997-2001, prevalence of chronic bronchitis was higher among the 65 and older age group than the 45-64 age group. During this period, trends for both groups were similar, with rates declining from 1997 to 1999 and increasing in 2001 (figure 3).

Figure 2 *Prevalence of Chronic Bronchitis by Age, Sex and Race, U.S., 2001*



Source: National Health Interview Survey, CDC, NCHS

Figure 3 *Trend in Prevalence of Chronic Bronchitis by Age, U.S., 1980-2001*



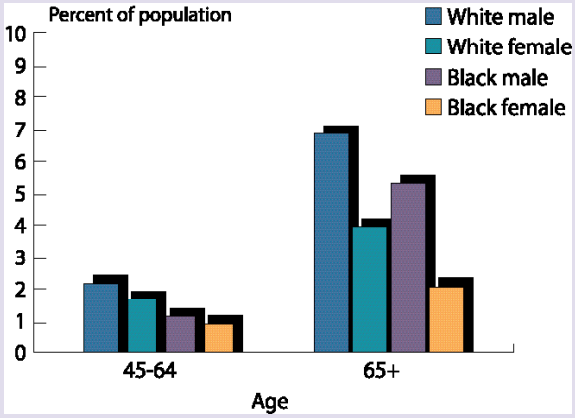
Source: National Health Interview Survey, CDC, NCHS
Discontinuity between 1996 and 1997 is due to change in the questions used to determine prevalence

EMPHYSEMA

In 2001, the prevalence of emphysema was appreciably higher for the 65 and older age group than the 45-64 age group for each race-sex group. The prevalence was higher in males than females and in whites than blacks. The prevalence was highest in white males and lowest in black females (figure 4). Over the past two decades, prevalence of emphysema has consistently been higher for the 65 and

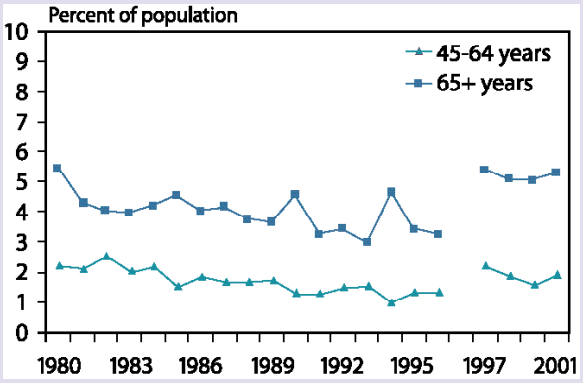
older age group. Between the period 1997 and 2001, the prevalence for the 65 and older age group was more than twice that of the 45-64 age group (figure 5).

Figure 4 *Prevalence of Emphysema by Age, Sex and Race, U.S., 2001*



Source: National Health Interview Survey, CDC, NCHS

Figure 5 *Trend in Prevalence of Emphysema by Age, U.S., 1980-2001*

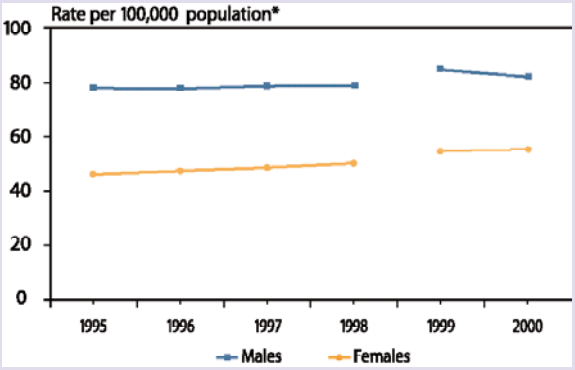


Source: National Health Interview Survey, CDC, NCHS
Discontinuity between 1996 and 1997 is due to change in the questions used to determine prevalence

MORTALITY

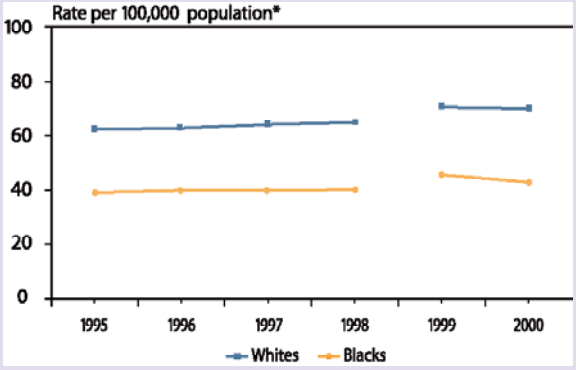
Mortality attributable to COPD has increased substantially in the U.S. In 2000, 119,054 adults 25 years and older died from COPD; 50.3 percent were females. Moreover, for females 25 years and older, the COPD age-adjusted death rate has more than doubled from 1980 to 2000 (20.1 vs. 56.7 per 100,000 population). COPD death rates were consistently higher for males than females from 1995-2000. In 2000, the death rate was 46 percent higher in males than females (82.6 vs. 56.7 per 100,000 population) (figure 6). COPD death rates were also consistently higher in whites than blacks from 1995-2000. In 2000, the death rate was 63 percent higher in whites than blacks (70.1 vs. 42.9 per 100,000 population) (figure 7). Across geographic regions of the U.S., the mountain States, particularly in the West, have the highest mortality from COPD (figure 8).

Figure 6 *Trend in Death Rates for COPD by Sex, 25 Years and Older, U.S., 1995-2000*



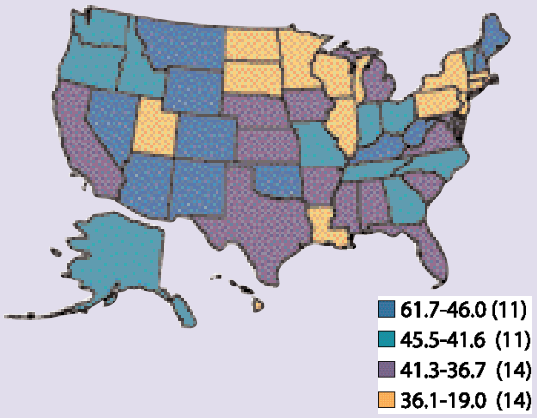
**Age-adjusted to 2000 U.S. population*
Source: Vital Statistics of the U.S., CDC, NCHS
Discontinuity between 1998 and 1999 is due to change in ICD codes

Figure 7 *Trend in Death Rates for COPD by Race, 25 Years and Older, U.S., 1995-2000*



**Age-adjusted to 2000 U.S. population*
Source: Vital Statistics of the U.S., CDC, NCHS
Discontinuity between 1998 and 1999 is due to change in ICD codes

Figure 8 *Age-Adjusted Death Rates* for COPD by State, U.S., 1996-1998*



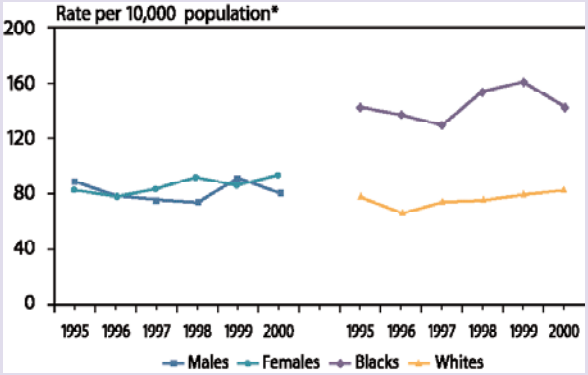
**Age-adjusted to 2000 U.S. population; rate per 100,000 population*
Source: Vital Statistics of the U.S., CDC, NCHS

EMERGENCY TREATMENTS AND HOSPITALIZATIONS

EMERGENCY DEPARTMENT VISITS

Patients with COPD require emergency treatment and sometimes hospitalizations during periods of exacerbations of their disease. During the period 1995-2000, the rates of emergency department visits showed no consistent pattern by sex, but were consistently higher for blacks than whites. In 2000, the rate for blacks was about 1.5 times higher than whites (figure 9).

Figure 9 *Trend in the Rate of Emergency Department Visits for COPD by Sex and Race, 25 Years and Older, U.S., 1995-2000*

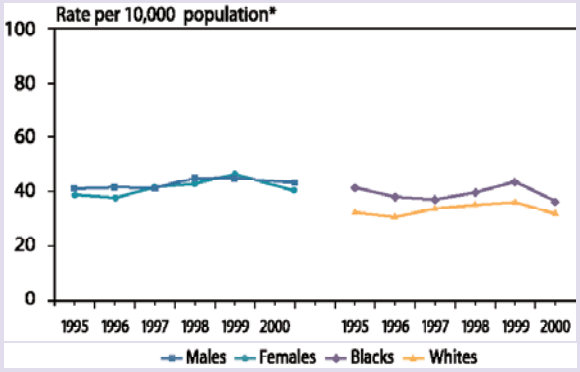


**Age-adjusted to 2000 U.S. population*
Source: National Hospital Ambulatory Medical Care Survey, CDC, NCHS

HOSPITALIZATIONS

From 1995 to 2000, the trend in COPD hospitalization rates was about the same for males and females. However, the rates were slightly higher among blacks than whites during this same period (figure 10). In 2000, the COPD hospitalization rates were 31.5 and 36.0 per 10,000 population for whites and blacks, respectively.

Figure 10 *Trend in Hospitalization Rates for COPD by Sex and Race, 25 Years and Older, U.S., 1995-2000*

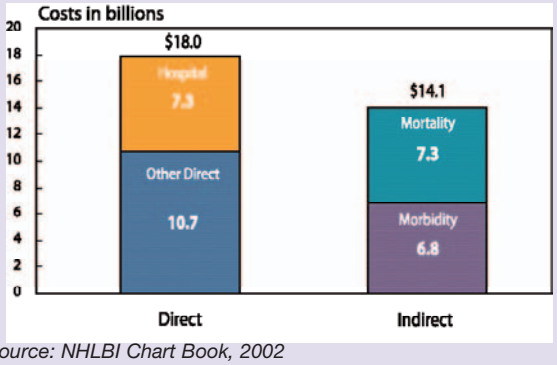


**Age-adjusted to 2000 U.S. population*
Source: National Hospital Discharge Survey, CDC, NCHS

COSTS OF COPD

The cost of COPD to the nation in 2002 was estimated to be $32.1 billion. Direct medical services accounted for $18.0 billion, and indirect cost of morbidity and premature mortality was $14.1 billion (figure 11). Medicare expenses for COPD beneficiaries were nearly 2.5 times that of the expenditures for all other patients.

Figure 11 *Estimated Cost of COPD, U.S., 2002*



Source: NHLBI Chart Book, 2002

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U.S. Department of Health
and Human Services
National Institutes of Health
National Heart, Lung, and
Blood Institute

NIH Publication No. 03-5229
March 2003

For more information contact:
NHLBI Health Information Center
P.O. Box 30105
Bethesda, MD 20824-0105
Call (301) 592-8573 or visit
NHLBI's Web site at
http://www.nhlbi.nih.gov

Breathing Better With a COPD Diagnosis

DID YOU KNOW?

COPD is the 4th leading cause of death in the United States and causes serious, long-term disability. The number of people with COPD is increasing. More than 12 million people are currently diagnosed with COPD and an additional 12 million likely have the disease and don't even know it.

But there is reason for hope. You've taken the first step by being aware of your symptoms and seeing your doctor for testing and diagnosis. Now that you know you have COPD, your doctor can suggest treatment options and ways to help you manage COPD and improve your quality of life.

WHAT IS COPD?

COPD is a serious lung disease that over time makes it hard to breathe. You may also have heard COPD called by other names, like emphysema or chronic bronchitis.

In people who have COPD, the airways—tubes that carry air in and out of your lungs—are partially blocked, which makes it hard for the air to get in and out. COPD develops slowly and worsens over time, so be sure to call your doctor to report any new symptoms or if your current symptoms get worse.

U.S. Department of Health and Human Services
National Institutes of Health
National Heart, Lung, and Blood Institute

WHEN YOU ARE DIAGNOSED WITH COPD

There are many things that you can do to make living with COPD easier:

Quit Smoking

If you smoke, the best thing you can do to prevent more damage to your lungs is to quit. Ask your doctor about new options for quitting. Many resources to help you quit are available online. Visit **www.smokefree.gov**; **www.lungusa.org**; or call 1-800-QUIT NOW for more information.

Talk with your doctor about treatment options. You can take steps to make breathing easier and live a longer and more active life.

Avoid Exposure to Pollutants

Try to stay away from other things that could irritate your lungs, like dust and strong fumes. Stay indoors when the outside air quality is poor. You should also stay away from places where there might be cigarette smoke.

Visit Your Doctor on a Regular Basis

See your doctor regularly, even if you are feeling fine. Be sure to bring a list of all medicines you are taking to each doctor's visit.

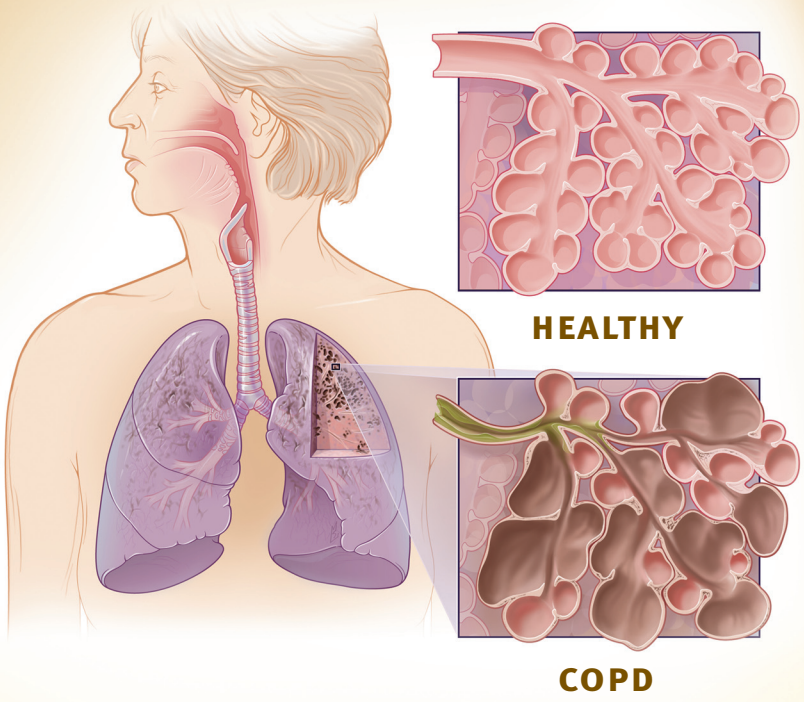
Follow Treatment Advice

Be sure to take your medications and follow your doctor's advice on how to treat your disease. If you have any questions—ASK!

How Does COPD Affect Breathing?

The "airways" are the tubes that carry air in and out of the lungs through the nose and mouth. Healthy airways and air sacs in the lungs are elastic—they try to bounce back to their original shape after being stretched or filled with air, just the way a new rubber band or balloon does. This elastic quality helps retain the normal structure of the lung and helps to move the air quickly in and out.

In people with COPD, the air sacs no longer bounce back to their original shape. The airways can also become swollen or thicker than normal, and mucus production might increase. The floppy airways are partially blocked, or obstructed, making it even harder to get air out of the lungs.



Take Precautions Against the Flu

Do your best to avoid crowds during flu season. It is also a good idea to get a flu shot every year, since the flu can cause serious problems for people with COPD. You should also ask your doctor about the pneumonia vaccine.

Seek Support From Other COPD Patients

There are many COPD support groups offered at local hospitals and there is a very active COPD community online. Family members are also a great resource for support as you learn to live with and manage COPD.

TAKING ACTION

Once you have been diagnosed with COPD, there are many ways that you and your doctor can work together to manage the symptoms of the disease and improve your quality of life. Your doctor may suggest one or more of the following options:

Medications (such as bronchodilators and inhaled steroids)

Bronchodilators are medicines that usually come in the form of an inhaler. They work to relax the muscles around your airways, to help open them and make it easier to breathe. Inhaled steroids

help prevent the airways from getting inflamed. Each patient is different—your doctor may suggest other types of medications that might work better for you.

Pulmonary Rehabilitation

Your doctor may recommend that you participate in pulmonary rehabilitation, or "rehab." This is a program that helps you learn to exercise and manage your disease with physical activity and counseling. It can help you stay active and carry out your day-to-day tasks.

Once you have been diagnosed with COPD, there are many ways that you and your doctor can work together to manage the symptoms of the disease and improve your quality of life.

Physical Activity Training

Your doctor or a pulmonary therapist recommended by your doctor might teach you some activities to help your arms and legs get stronger and/or breathing exercises that strengthen the muscles needed for breathing.

Lifestyle Changes

Lifestyle changes such as quitting smoking can help you manage the effects of COPD.

Oxygen Treatment

If your COPD is severe, your doctor might suggest oxygen therapy to help with shortness of breath. You might need oxygen all of the time or just some of the time—your doctor will work with you to learn which treatment will be most helpful.

Surgery

Patients with very severe COPD may have a hard time breathing all the time. In some of these cases, doctors may suggest lung surgery to improve breathing and help lessen some of the most severe symptoms.

Spirometry Can Help Your Doctor Determine the Best Course of Treatment

Spirometry is a simple, noninvasive breathing test that measures the amount of air a person can blow out of the lungs (volume) and how fast he or she can blow it out (flow). The spirometry reading can help your doctor assess how well your lungs are working and determine the best course of treatment.

Spirometry is one of the best and most common lung function tests. The test is done with a spirometer, a machine that measures how well your lungs function, records the results, and displays them on a graph for your doctor. You will be asked to take a deep breath, then blow out as hard and as fast as you can using a mouthpiece connected to the machine with tubing. The spirometer then measures the total amount of air exhaled, called the forced vital capacity or FVC, and how much you exhaled in the first second, called the forced expiratory volume in 1 second or FEV_1. Your doctor will use the results to assess how well your lungs are working and whether or not you have COPD.

When To Get Emergency Help

Seek emergency help if your usual medications aren't working and:

- You find that it is unusually hard to walk or talk (such as difficulty completing a sentence).
- Your heart is beating very fast or irregularly.
- Your lips or fingernails are gray or blue.
- Your breathing is fast and hard, even when you are using your medication.

Be prepared and have information on hand that you or others would need in a medical emergency, such as a list of medicines you are taking, the name of your doctor and his/her contact information, directions to the hospital or your doctor's office, and people to contact if you are unable to speak or drive yourself to the doctor or hospital.

Managing Complications

Symptoms of COPD can get worse all of a sudden. When this happens, it is much harder to catch your breath. You might also have chest tightness, more coughing or a change in your cough (becomes more productive, more mucus is expelled), and a fever.

When symptoms get worse quickly, it could be a sign of a lung infection. There could be other causes for symptoms getting worse, such as heart disease related to severe lung damage. The best thing to do is call your doctor right away so he or she can find out what the cause of the problem is and take steps to treat it.

LEARN MORE BREATHE BETTER

If you think you might be at risk for COPD, get a simple breathing test. Talk with your doctor about treatment options. You can take steps to make breathing easier and live a longer and more active life.

For more information, visit **www.LearnAboutCOPD.org**.

Or contact the National Heart, Lung, and Blood Institute at **www.nhlbi.nih.gov**.

COPD Learn More Breathe Better

U.S. Department of Health and Human Services
National Institutes of Health

National Heart Lung and Blood Institute

NIH Publication No. 07-5841
Originally printed September 2006
Reprinted December 2006

Cirrhosis

Definition

Cirrhosis is a consequence of chronic liver disease characterized by replacement of liver tissue by fibrotic scar tissue, leading to progressive loss of liver function. It is most commonly caused by alcoholism and hepatitis C, but has many other possible causes.

Characteristics

Many people with cirrhosis have no symptoms in the early stages of the disease. However, as scar tissue replaces healthy cells, liver function starts to fail and a person may experience the following symptoms:

- exhaustion
- fatigue
- loss of appetite
- nausea
- weakness
- weight loss
- abdominal pain
- spider-like blood vessels (spider angiomas) that develop on the skin

Complications of cirrhosis are serious and caused by the buildup of toxins in the system and backup of blood flow through the vessels leading to the liver.

Functional Considerations

- People who have cirrhosis can have very low energy affecting all ADLs and IADLs.
- Consumers who are experiencing low energy and fatigue may need a significant amount of IHSS services.
- Consider need for referral for family issues related to condition, especially if still drinking.
- If the consumer states they are having sticky, black stools, it could be an indication of bleeding. They should be strongly encouraged to see their MD immediately.

Cirrhosis

Cirrhosis of the Liver

The liver, the largest organ in the body, is essential in keeping the body functioning properly. It removes or neutralizes poisons from the blood, produces immune agents to control infection, and removes germs and bacteria from the blood. It makes proteins that regulate blood clotting and produces bile to help absorb fats and fat-soluble vitamins. A person cannot live without a functioning liver.

In cirrhosis of the liver, scar tissue replaces normal, healthy tissue, blocking the flow of blood through the organ and preventing it from working as it should. Cirrhosis is the twelfth leading cause of death by disease, killing about 26,000 people each year.

Causes

Cirrhosis has many causes. In the United States, chronic alcoholism and hepatitis C are the most common ones.

Alcoholic liver disease	o Usually develops after more than a decade of heavy drinking. o The amount of alcohol that can injure the liver varies greatly from person to person. o Alcohol seems to injure the liver by blocking the normal metabolism of protein, fats, and carbohydrates.
Chronic hepatitis C	o Infection with this virus causes inflammation of and low grade damage to the liver that over several decades can lead to cirrhosis.
Chronic hepatitis B and D	o Hepatitis B virus is probably the most common cause of cirrhosis worldwide, but it is less common in the United States. o Causes liver inflammation and injury that over several decades can lead to cirrhosis. o Hepatitis D virus that infects the liver, but only in people who already have hepatitis B.
Autoimmune hepatitis	o Immune system attacks the liver and causes inflammation, damage, and eventually scarring and cirrhosis.
Inherited diseases	o Alpha-1 antitrypsin deficiency, hemochromatosis, Wilson's disease, galactosemia, and glycogen storage diseases are among the inherited diseases that interfere with the way the liver produces, processes, and stores enzymes, proteins, metals, and other substances the body needs to function properly.
Nonalcoholic steatohepatitis (NASH)	o Fat builds up in the liver and eventually causes scar tissue. o Appears to be associated with diabetes, protein malnutrition, obesity, coronary artery disease, and treatment with corticosteroid medications.
Blocked bile ducts	o Most common cause is primary biliary cirrhosis, a disease in which the ducts become inflamed, blocked, and scarred. o Secondary biliary cirrhosis can happen after gallbladder surgery if the ducts are inadvertently tied off or injured.
Drugs, toxins, and infections	o Severe reactions to prescription drugs, prolonged exposure to environmental toxins, the parasitic infection schistosomiasis, and repeated bouts of heart failure with liver congestion can all lead to cirrhosis.

Symptoms

Many people with cirrhosis have no symptoms in the early stages of the disease. However, as scar tissue replaces healthy cells, liver function starts to fail and a person may experience the following symptoms:

- exhaustion
- fatigue
- loss of appetite
- nausea
- weakness
- weight loss
- abdominal pain
- spider-like blood vessels (spider angiomas) that develop on the skin

As the disease progresses, complications may develop. In some people, these may be the first signs of the disease.

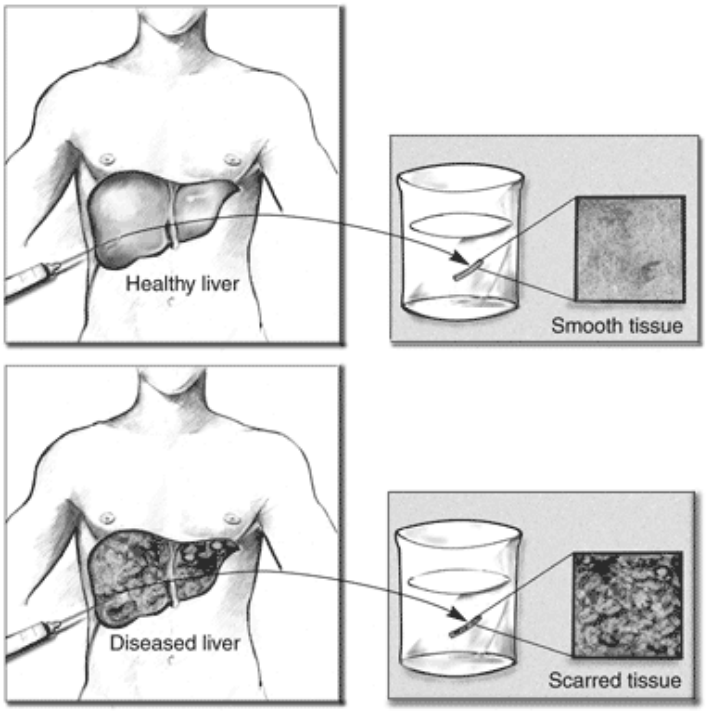
Complications of Cirrhosis

Edema and ascites	o When the liver loses its ability to make the protein albumin, water accumulates in the legs (edema) and abdomen (ascites).
Bruising and bleeding	o When the liver slows or stops production of the proteins needed for blood clotting, a person will bruise or bleed easily. o The palms of the hands may be reddish and blotchy with palmar erythema.
Jaundice	o Jaundice is a yellowing of the skin and eyes that occurs when the diseased liver does not absorb enough bilirubin.
Itching	o Bile products deposited in the skin may cause intense itching.
Gallstones	o If cirrhosis prevents bile from reaching the gallbladder, gallstones may develop.
Toxins in the blood or brain	o A damaged liver cannot remove toxins from the blood, causing them to accumulate in the blood and eventually the brain. o Can dull mental functioning and cause personality changes, coma, and even death. o Signs of the buildup of toxins in the brain include neglect of personal appearance, unresponsiveness, forgetfulness, trouble concentrating, or changes in sleep habits.
Sensitivity to medication	o Because the liver does not remove drugs from the blood at the usual rate, they act longer than expected and build up in the body. o This causes a person to be more sensitive to medications and their side effects.
Portal hypertension	o Cirrhosis slows the normal flow of blood through the portal vein, which increases the pressure inside it. o This condition is called portal hypertension.
Varices	o When blood flow through the portal vein slows, blood from the intestines and spleen backs up into blood vessels in the stomach and esophagus causing them to enlarge. o The enlarged blood vessels are called varices. o They have thin walls and carry high pressure, and thus are likely to burst. o If they do burst, the result is a serious bleeding problem in the upper stomach or esophagus that requires immediate medical attention.

Insulin resistance and type 2 diabetes	o Cirrhosis causes resistance to insulin. o The pancreas tries to keep up with the demand for insulin by producing more. o Eventually, the pancreas cannot keep up with the body's need for insulin, and type 2 diabetes develops as excess glucose builds up in the bloodstream.
Liver cancer	o Hepatocellular carcinoma, a type of liver cancer commonly caused by cirrhosis, starts in the liver tissue itself. o It has a high mortality rate.
Problems in other organs	o Cirrhosis can cause immune system dysfunction, leading to infection. o Fluid in the abdomen (ascites) may become infected with bacteria normally present in the intestines. o Cirrhosis can also lead to impotence, kidney dysfunction and failure, and osteoporosis.

Diagnosis

The doctor may diagnose cirrhosis on the basis of symptoms, laboratory tests, the medical history, and a physical examination. For example, during a physical examination, the doctor may notice that the liver feels harder or larger than usual and order blood tests that can show whether liver disease is present.



If looking at the liver is necessary to check for signs of disease, the doctor might order a computerized axial tomography (CAT) scan, ultrasound, magnetic resonance imaging (MRI), or a scan of the liver using a radioisotope (a harmless radioactive substance that highlights the liver). Or the doctor might look at the liver using a laparoscope, an instrument that is inserted through the abdomen and relays pictures back to a computer screen.

A liver biopsy will confirm the diagnosis. For a biopsy, the doctor uses a needle to take a tiny sample of liver tissue, and then examines it under the microscope for scarring or other signs of disease.

Treatment

Once you have cirrhosis, nothing can make the scar tissue go away completely. However, treating the cause will keep cirrhosis from getting worse. For example, if cirrhosis is due to alcoholic liver disease, the treatment is to completely stop drinking alcohol. If cirrhosis is caused by hepatitis C, then that disease may be treated with medication.

Treatment will also include remedies for complications. For example:

- **Ascites and edema** – a low-sodium diet or the use of diuretics
- **Infections** – antibiotics
- **Itching** – various medications
- **Toxins** – low protein diet and/or laxatives to help absorb the toxins and remove them from the intestines
- **portal hypertension** – blood pressure medication such as a beta-blocker
- **Bleeding varices** – the doctor may either inject them with a clotting agent or perform a so-called rubber-band ligatio

When complications cannot be controlled or when the liver becomes so damaged from scarring that it completely stops functioning, a **liver transplant** is necessary. In liver transplantation surgery, a diseased liver is removed and replaced with a healthy one from an organ donor. About 80 to 90 percent of patients survive liver transplantation. Survival rates have improved over the past several years because of drugs such as cyclosporine and tacrolimus, which suppress the immune system and keep it from attacking and damaging the new liver.

Adapted (8-07) from: NIH Publication No. 04–1134, December 2003 and NIH Publication No. 06–5166 National Digestive Diseases Information Clearinghouse (NDDIC),National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) www.niddk.nih.gov

Hepatitis Facts

http://www.silenceisdeadly.com/

Hepatitis A

Hepatitis A is one of the most common strains of Hepatitis, and is found in the feces of an infected person. It is spread as a result of poor personal hygiene and/or proper sanitation. One can become contract the Hepatitis A by eating food that has been prepared by one infected with the virus or by drinking Hepatitis A contaminated water. One can also contract Hepatitis A through close physical contact (i.e. sexual intercourse). Although some people do not experience symptoms, things to look out for are:

- High Fever
- Nausea
- Fatigue
- Jaundice or Yellowing of Eyes and Skin
- Loss of Appetite
- Diarrhea
- Abdominal Pain
- Dark Urine

Symptoms usually last around six weeks, although there are those who remain ill for up to six months. A blood test should be taken to know for sure if one is infected. Hepatitis A has an average incubation period of 28 days.

A combination vaccine for prevention of both Hepatitis A and B is now available to the public for those aged 18 years or older (Twinrix). Otherwise, a Hepatitis A vaccine may be administered, or for short-term protection, an immune globulin injection may be given.

Hepatitis B

Hepatitis B is contracted through direct contact with infected blood or bodily fluids of an infected person. The routes of transmission are quite similar to those of Hepatitis C, EXCEPT for the fact that one can also contract Hepatitis B through sexual intercourse as well as by sharing needles, razors, and toothbrushes. Sadly, an infant can also contract the virus during childbirth from an infected mother. Hepatitis B is not spread through food, water, or casual contact. The symptoms of Hepatitis B Virus include:

- Loss of Appetite
- Jaundice or Yellowing of Eyes or Skin
- Nausea, Vomiting, Fever, Stomach and/or Joint Pain
- Extreme Fatigue

There are people with Hepatitis B who experience no symptoms at all. A blood test is the only concrete evidence of infection.

Once infected with Hepatitis B, there is no immediate cure. Treatment for Hepatitis B is used for chronic infection, and usually involves interferon injections combined with oral anti-viral medication; Lamivudine, Dipivoxil, and Adefovir are the names of some of the medications used. Treatment usually lasts anywhere from 16 to 48 weeks. Unfortunately, those with Hepatitis B virus will always be carriers of the virus.

Hepatitis C

Hepatitis C is a blood borne virus that attacks liver cells. The virus is contracted through contact with infected blood and has an incubation period of anywhere from 10 to 30 years. Routes of transmission include:

- Blood Transfusions
- IV Drug Use
- Sharing Razors or Toothbrushes
- Tattoos and body Piercings.

Hepatitis C was identified in 1989, and in 1990 a Hepatitis C antibody test became commercially available. Rarely do infected patients experience acute symptoms from Hepatitis C, but instead suffer from other ailments related to the disease such as:

- Extreme Fatigue,
- Mental Cloudiness, and
- Digestive Problems and Loss of Appetite.

As the disease progresses, it can lead to various levels of fibrosis (scar tissue), then cirrhosis of the liver, and over time liver cancer. There is as of yet, no known vaccine nor cure. The treatments for Hepatitis C include injections of a synthetic form of interferon (a protein that helps the body's cells resist the virus), usually accompanied by Ribavirn, an anti-viral pill. Most experience debilitating side effects. Chinese medicine, including acupuncture and herbal remedies, is often used to treat Hepatitis C. Some patients even integrate both Eastern and Western therapies. Approximately 20% of patients with chronic Hepatitis C will die from liver failure due to advanced liver disease. Others will be forced to undergo a liver transplant. Still, many others, if they take proper care of themselves, can live out a normal life span.

Congestive Heart Failure (CHF)

Definition

CHF is a condition in which the heart cannot pump enough blood throughout the body. The heart cannot fill with enough blood or pump with enough force, or both.

Characteristics

Heart failure develops over time as the pumping action of the heart gets weaker. It can affect the right, the left, or both sides of the heart. Heart failure does not mean that the heart has stopped working or is about to stop working. It means that the heart is not able to pump blood the way that it should.

The weakening of the heart's pumping ability causes:

- Blood and fluid to "back up" into the lungs
- The buildup of fluid in the feet, ankles, and legs
- Tiredness and shortness of breath

Functional Considerations

- ADLs and IADLs can be greatly affected as the disease progresses.
- Shortness of breath, fatigue, and edema can create low endurance.
- Fatigue, weakness and shortness of breath may be the primary causes of dependency for IHSS services.
- It is a progressive disease, so impairment is likely to worsen over time.

National Heart Lung and Blood Institute

Heart Failure

What is Heart Failure?

Heart failure is a condition in which the heart can't pump enough blood throughout the body. The heart cannot fill with enough blood or pump with enough force, or both. Heart failure develops over time as the pumping action of the heart gets weaker. It can affect the right, the left, or both sides of the heart. Heart failure does not mean that the heart has stopped working or is about to stop working. It means that the heart is not able to pump blood the way that it should.

Most cases involve the left side where the heart can't pump enough oxygen-rich blood to the rest of the body. With right-sided failure, the heart can't effectively pump blood to the lungs where the blood picks up oxygen.

The weakening of the heart's pumping ability causes:

- Blood and fluid to "back up" into the lungs
- The buildup of fluid in the feet, ankles, and legs
- Tiredness and shortness of breath

Heart failure is a serious condition. About 5 million people in the United States have heart failure, and the number is growing. Each year, another 550,000 people are diagnosed for the first time. It contributes to or causes about 300,000 deaths each year.

Heart failure is most common in those who are age 65 years and older and is the number one reason older people are hospitalized.
Heart failure tends to be more common in men than in women, but because women usually live longer, the condition affects more women in their 70s and 80s.

Heart failure can also be called **congestive heart failure,** systolic heart failure, diastolic heart failure, left-sided heart failure, or right-sided heart failure.

What Causes Heart Failure?

Heart failure is caused by other diseases or conditions that damage or overwork the heart muscle. Over time, the heart muscle weakens and is not able to pump blood as well as it should.

The leading causes of heart failure:	
Coronary artery disease (CAD)	CAD, including angina and heart attack is the most common underlying cause of heart failure. People who have a heart attack are at high risk of developing heart failure.
High blood pressure	Most people with heart failure also have high blood pressure.
Diabetes	About one in three has diabetes.
Other causes of heart failure – diseases and conditions that can lead to heart failure:	
Cardiomyopathy	A disease of the heart muscle.
Diseases of the heart valves	
Abnormal heartbeats or arrhythmias	
Congenital heart defects	A heart defect or problem present at birth.

Other conditions that may injure the heart muscle and lead to heart failure include:	
Treatments for cancer	Such as radiation and certain chemotherapy drugs.
Thyroid disorders	Having either too much or too little thyroid hormone in the body.
Alcohol abuse	
HIV/AIDS	
Cocaine and other illegal drug	

Who is At Risk for Heart Failure?

Heart failure can happen to anyone, but it's more common in:

- People 65 years of age and older
- African Americans

Heart failure is very common in people 65 years of age and older. It's the #1 reason for a hospital visit in this age group.

African Americans are more likely to have heart failure and suffer more severely from it. African Americans are more likely to:

- Develop symptoms at an earlier age
- Have their heart failure get worse faster
- Have more hospital visits
- Die from heart failure

Men have a higher rate of heart failure than women. But in actual numbers, more women have heart failure because many more women live into their seventies and eighties, when heart failure is common.

Children with congenital heart defects can also have heart failure.

What are the Signs and Symptoms of Heart Failure?

Symptoms of heart failure are caused by fluid build up in the system.
The most common signs and symptoms are:

1. Shortness of breath or difficulty breathing	Are caused by the buildup of fluid in the lungs and around the lungs (pleural effusions).
2. Feeling tired	
3. Swelling in the ankles, feet, legs, and sometimes the abdomen	From the buildup of fluid in the body (edema).

Effects on Physical Activity

Shortness of breath and feeling tired.
When symptoms start, the person may feel tired and short of breath after routine physical exertion. Climbing two flights of stairs makes them feel winded.

As heart failure progresses, the symptoms get worse. And the patient may begin to feel tired and short of breath after simple activities, like getting dressed or walking across the room. Some people have shortness of breath when lying flat.

Fluid buildup in the lungs can also cause a cough. The cough is worse at night and when lying down. Excessive fluid in the lungs can cause a life-threatening condition called acute pulmonary edema. This condition requires emergency treatment.

Swelling is from the buildup of fluid in the body (edema). Other signs of fluid buildup are:

- Weight gain
- Frequent urination

Limitation on Physical Activity

Symptoms are classified based on how much they limit daily activity.

Class 1: No limits	Ordinary physical activity does not cause undue tiredness or shortness of breath.
Class 2: Slight or mild limits	Comfortable at rest, but ordinary physical activity results in tiredness or shortness of breath.
Class 3: Marked or noticeable limits	Comfortable at rest, but less than ordinary physical activity causes tiredness or shortness of breath.
Class 4: Severe limits	Unable to carry on any physical activity without discomfort. Symptoms are also present at rest. If any physical activity is undertaken, discomfort increases.

How is Heart Failure Diagnosed?

There is not a specific test to determine if someone has heart failure. A clinical diagnosis of heart failure is usually made when symptoms appear. The symptoms—shortness of breath, tiredness, and fluid buildup—are common in other conditions.

The doctor will determine if a person has heart failure by performing a detailed medical history, a physical exam, and several tests. The purpose of these is to:

- Identify the presence of diseases and conditions that can cause heart failure
- Rule out other causes of symptoms
- Determine the amount of damage to and the pumping capability of the heart

Medical and Family History	• Is there a personal or family history of any of the diseases and conditions that can cause heart failure? • Types of symptoms, when they occur, how long they have been present and, their severity.
Physical Examination	• Assess heart for abnormal sounds. • Assess lungs for the buildup of fluid. • Look for swelling in the ankles, feet, legs, and abdomen. • Look for swelling in the veins in the neck.

Tests:

EKG (electrocardiogram)	• Measure the rate and regularity of the heartbeat. • May show a history of heart attack or if there is thickening of the walls in the heart's pumping chambers (ventricles).
Chest x ray	• Can show if the heart is enlarged, if there is fluid in the lungs, or if there is lung disease.

BNP blood test	• New test that checks the level of a hormone called BNP (B-type natriuretic peptide) that rises in heart failure.
Echocardiogram	• Most useful test for diagnosing heart failure. • Uses sound waves to create a moving picture of the heart to: o look at the size and shape of the heart, o how well the heart chambers and valves are functioning, o identify areas of poor blood flow to the heart, o identify areas of heart muscle that are not contracting normally, and o identify previous injury to the heart muscle caused by poor blood flow.
Stress echocardiogram	• Done both before and after the heart is stressed by exercise or with a medication. • Usually done to rule out CAD.
Holter monitor	• Ambulatory electrocardiography, EKG. • Electrodes are placed on the chest and the monitor is worn for 24 hours. • Shows heart function during normal activities.
Nuclear heart scan	• Provides moving pictures of the blood passing through the heart's chambers and arteries and shows the level of blood flood to the heart muscle. • Can also be done under stress to assess function.
Cardiac catheterization	• Catheter threaded through vessel to heart to measure blood pressure and flow as well as examine by x-ray.
Coronary angiography	• Done along with catheterization by injecting dye and following flow via x-ray. • Assesses heart's ability to pump and blood flow through coronary arteries.
magnetic resonance imaging (MRI)	• Shows detailed images of the structures and beating of the heart, better assess if parts of the heart are weak or damaged.
positron emission tomography (PET)	• Shows the level of chemical activity in different areas of the heart which can help determine if enough blood is flowing to the areas of the heart.
Thyroid functions tests	• Common procedures done to find out how well the thyroid is functioning • Both an overactive and an underactive thyroid can be the main or a contributing cause of heart failure.

How is Heart Failure Treated?

The goals of treatment are to:

- Treat the underlying cause of heart failure
- Improve symptoms and quality of life
- Stop heart failure from getting worse
- Prolong life span

The doctor will continue to treat the underlying diseases or conditions (such as coronary artery disease, high blood pressure, or diabetes) that caused heart failure. The treatment for heart failure includes:

Lifestyle Changes	• Follow a diet low in salt. Salt can cause extra fluid to build up in the body, making the heart failure worse. • Limit fluids. • Weigh every day, and report any sudden weight gain to the doctor. This could mean there is extra fluid building up in the body. • Exercise as directed to help build fitness level and ability to be more active. • Lose weight if overweight. • Quit smoking. • Limit the amount of alcohol.
Medicines	• Diuretics (water or fluid pills) to help reduce fluid buildup in the lungs and swelling feet and ankles. • ACE inhibitors to lower blood pressure and reduce the strain on the heart. These medicines also may reduce the risk of a future heart attack. • Beta blockers to slow heart rate and lower blood pressure to decrease the workload on the heart. • Digoxin to make the heart beat stronger and pump more blood.
Specialized Care for Severe Heart Failure	• When lifestyle changes and regular medicines may not be enough to control worsening symptoms.
Oxygen	• To aide in breathing – may be used at home.
Mechanical heart pump	• A special device placed inside the body to help pump blood to the rest of the body. • May be used short or long term.
Heart transplant	• Replace a heart failure patient's heart with a healthy heart from someone who has recently died. • Is indicated in some people when all other treatments fail to control symptoms.

Living with Heart Failure

- Heart failure usually can't be cured, and the patient will likely have to take medicine for the rest of their life.
- Symptoms may get worse over time.
- As symptoms get worse, a person may not be able to do many of the things that they did before they had heart failure.

Common causes that worsen symptoms and can lead to a crisis or even a hospital stay are:

- Forgetting to take medicines
- Not following diet (such as eating salty foods)
- Drinking excessive amounts of alcohol

Report any problems with medicines. When taking several medicines, there is always a chance for side effects and interaction between the medicines. The patient should check with the doctor before adding any new medicines. This includes over-the-counter medicines and herbal supplements.

Avoid respiratory infections like the flu and pneumonia. Heart failure patients should get flu and pneumonia shots if not contraindicated.

Be prepared for an emergency. Good information to have on hand in case the patient needs to go to the hospital unexpectedly:

- Phone numbers for the doctor, hospital, and people who can take to the hospital or doctor
- Directions to the hospital and doctor's office
- A list of current medications

Special Needs for Severe Heart Failure

In the advanced stages, heart failure is a progressive condition that can generally be expected to get worse and eventually lead to death. The patient should consider what they want as final treatments. Patients should have **Advance directives** which are documents that tell doctors and hospitals what treatment they want or do not want if they are too ill to speak for themselves. This should be done with family while the patient is able. It's important that the patient or a family member bring a copy of the advance directives every time they go to the hospital

For patients that are end stage, **Hospice care** is available when treatment is no longer working. Hospice provides a team of providers to support the patient and family at the end of life.

Adapted (9-07) from: NHLBI http://www.nhlbi.nih.gov/health/dci/Diseases/Hf/HF_All.html

Tips for a Low Sodium Diet

Sodium is a mineral found as a natural ingredient in many foods. The most common form of sodium is salt. The low-sodium diet allows you 1/8-teaspoon of salt per day to use in food preparation or at the table. Salt substitutes use potassium instead of sodium. You may use them if your doctor approves. However, one should not use salt substitutes with some medications. Check with your doctor to be sure that you can use a salt substitute each time your medication changes.

Following is a list of foods recommended on a low-sodium diet, then a list of those to avoid.

Recommended Foods

Milk and dairy Products (limit to 2-cups)	• Whole, 2-percent, 1-percent, skim fluid, evaporated or powdered milk • Yogurt, chocolate milk as part of the milk allowances • Low sodium buttermilk • 1-cup of milk equals 130mg sodium
Meat Group (limit four to six ounces daily)	• Four to six ounces per day of cooked weight of any meat, poultry (beef, lamb, pork, veal, liver, chicken, duck or turkey) or fish prepared or preserved without salt or sodium • Canned tuna or salmon rinsed or low-sodium tuna and low sodium salmon • One egg daily or 1/3-cup egg substitute daily, including that used in cooking • Low sodium peanut butter (2-tablespoons equals 1-ounce of meat) unsalted nuts • 1-ounce low sodium cheese or you may substitute low sodium cottage cheese for 1-ounce of meat • Canned kidney beans, rinsed, and frozen dinners with less than 500mg sodium
Vegetables	• Unlimited amounts of fresh, frozen (without salt or sodium added), or salt-free canned vegetables or vegetable juices without salt or sodium added • Include a good source of Vitamin A at least every other day such as a dark green or a deep yellow vegetable
Fruits	• Any kind of fruit or fruit juice, fresh, frozen, or canned except those listed in foods to avoid • Include a good source of Vitamin C daily such as citrus fruit or juice, strawberries, raw cabbage and cantaloupe
Bread and Cereals	• Four slices of regular bread or equivalent per day (bread, rolls, crackers without salted tops) • Sandwich rolls equal two servings of bread • One (3/4-ounce) serving of dry cereal per day (250mg or less) • Cereals cooked without added salt • You may use salt free bread, rolls, and crackers as desired • Rice, macaroni, spaghetti, noodles, barley prepared without added salt • Unsalted popcorn or pretzels
Fats	• Four teaspoons per day of regular salted butter, margarine, mayonnaise or mayonnaise type salad dressing or low-sodium mayonnaise • Unsalted butter, margarine or salad dressing is not restricted • Cooking fat or oil • Low sodium salad dressings, cream, non-dairy creamers, sour cream • Unsalted nuts, avocado
Soups	• Home made soups made without salt or restricted seasonings • Low sodium bouillon, broth and soups • Low sodium cream soups made from milk allowance and allowed foods

Beverages	• Coffee, decaffeinated coffee, tea, cereal beverages such as Postum • Sodium containing carbonated beverages limited to 24-ounces per day • Alcoholic beverages with doctor's permission • Cocoa made with milk allowance without added salt
Desserts	• Gelatin desserts or diet gelatin as desired • Fruit ice; home made tapioca, rice and cornstarch pudding or custard made with allowed milk and egg allowance and without the addition of salt or sodium
Miscellaneous	• Spices and herbs which do not contain sodium or salt compounds • Vinegar, lemon, fresh horse radish without added salt, baking powder and baking soda for allowed baked products only, cream of tartar, Tabasco sauce, Veg-It, Mrs. Dash, yeast, low-sodium catsup, low-sodium baking powder, low-sodium baking soda, low sodium chili sauce • You may use a salt substitute or seasoned salt substitute blend containing no sodium with your doctor's approval

Foods to Avoid

Milk and dairy Products (limit to 2-cups)	• Avoid more than 2-cups per day • Buttermilk, malted milk, milk shakes, chocolate milk
Meat Group (limit four to six ounces daily)	• Any salted, smoked, cured, pickled, dried or canned meat, fish or poultry such as bacon, bacon bits, turkey bacon, bologna, chipped or corned beef, breaded meats, frankfurters, bratwurst, ham, meats koshered by salting, luncheon meats, salt pork, sausage, anchovies, caviar, pickled herring, sardines • Regular peanut butter, salted nuts • Regular cottage cheese and all other cheese except those listed on the allowed list • Canned baked beans • Canned, packaged and frozen dinners with more than 500mg sodium
Vegetables	• Sauerkraut, pickles, olives and other vegetables prepared in a brine • Canned and frozen vegetables if processed with salt or sodium • Salted potato chips, instant potatoes or potato mixes • Regular vegetable or tomato juice
Fruits	• Crystallized or glazed fruit
Bread and Cereals	• Not more than four slices per day of sodium containing breads or rolls; not more than 1-3/4 cup serving daily of dry cereal • Breads, rolls and crackers with salted tops • Pretzels and other salted snack foods • Self-rising flour, mixes containing salt or sodium, biscuit mixes, instant cooked cereals, avoid those with added salt or sodium compounds • Cornbread and commercial mixes (i.e., pancake, waffle, rice or pasta mixes, biscuit, etc.) unless low in sodium • Stuffing mixes, regular bread crumbs or cracker crumbs
Fats	• Sodium-containing salad dressings, bacon and bacon fat, tartar sauce and salted nuts • Gravies made with mixes or bouillon cubes • Cream cheese • Snack dips made with instant soup mixes or processed cheese
Soups	• Regular canned and dehydrated package soups, broth's, bouillon and consommé
Beverages	• Instant cocoa mixes • Water with softening equipment

Desserts	• Other desserts with less than 125mg sodium • More than one serving per day of regular cake, cookies, pie, sherbet, custard, ice cream and ice milk • Instant pudding, whipped topping
Miscellaneous	• Salt, flavored salts, mono-sodium glutamate (MSG), prepared horseradish, prepared mustard, catsup, meat sauces, chili sauce, barbeque sauces, meat tenderizers, soy sauce, teriyaki sauce, tartar sauce, Worcestershire sauce, flavored vinegar, relish, olives, pickles, salted snack foods, salted snack foods, salted nuts, cooking wine • Dutch processed cocoa or chocolate • Read labels on mixed spices to be sure there is not an addition of salt • Sea salt, lite salt (Morton's), Kitchen Bouquet, Butter Buds • Prepared package mix gravy

Substitutions and Hints

Season foods with herbs and spices. Use onions, garlic, parsley, lemon and lime juice and rind, dill weed, basil, tarragon, marjoram, thyme, curry powder, turmeric, cumin, paprika, vinegar, or wine to enhance the flavor and aroma of foods. Mushrooms, celery, red pepper, yellow pepper, green pepper, and dried fruits also enhance specific dishes.
Eat fresh foods (instead of canned or packaged foods) as much as possible. Also, plain frozen fruits and vegetables usually do not have added salt.
Add a pinch of sugar or a squeeze of lemon juice to bring out the flavor in fresh vegetables.
If you must use canned products, use the low-sodium types (except for fruit). Rinse canned vegetables with tap water before cooking.
Substitute unsalted, polyunsaturated margarine for regular margarine or butter.
Eat low-sodium cheeses. Many are available now, some with herbs and spices that are very tasty, and many are also low-fat.
Drink low-sodium juices.
Make unsalted or lightly salted soup stocks and keep them in the freezer to use as substitutes for canned broth and bouillon. Use these broths to enhance vegetables.
Substitute wines and vinegars (especially the flavored vinegars) for salt to enhance flavors.
Eat tuna and salmon packed in water instead of oil, and rinse first with running water.
Use one or more of the following to season chicken: curry, turmeric, cumin, cilantro, tarragon, thyme, sage, onions, garlic, mushrooms, tomatoes, or orange, lemon, or lime juice with ginger.
Use one or more of the following to season beef: dry mustard, marjoram, thyme, bay leaf, pepper, red wine, mushrooms, onions, red or green pepper, parsley, curry, green chilies, or orange rind.

Use one or more of the following to season seafood: lemon, parsley, paprika, wine, garlic and onions, cilantro, ginger, bay leaf, fennel, dill, marjoram, or thyme.
Use one or more of the following to season noodles: basil, oregano, fresh tomatoes, onions, garlic, green pepper, red pepper, yellow pepper, low-salt salad dressings, pine nuts, or low-salt mozzarella cheese.
Cook rice in homemade broth with mushrooms and scallions or shallots.

Reading Labels

If a product changed to a lower sodium level, you may see these various terms alerting you to the changes:

- Reduced or less sodium: At least 35-percent less sodium than the original version of the product
- Light in Sodium: At least 50-percent less sodium than the original version of the product
- Low Sodium: 140mg of sodium (or less) per serving
- Sodium Free: Less than 5mg of sodium per serving

Dining Out

When dining out, you can reduce the sodium content of a meal by trying these simple suggestions:

- Use pepper, lemon juice, or bring your own salt free seasoning for flavor.
- Go easy on condiments and sauces. Mustards, catsup, salad dressings, sauces and gravy substantially increase the amount of sodium in your meal.
- Request that food is prepared without added salt and ask for sauces, salad dressing and gravy be served on the side.
- Recognize words that indicate a high sodium content; marinated, pickled, smoked, au jus, teriyaki, soy sauce or in broth.
- Keep it simple. Often special sauces and toppings add extra sodium to foods. Ordering a broiled cut of meat or fish is a better choice than entrees covered with special sauces. Plain meat-type sandwiches are lower in sodium than chicken, egg or tuna salad sandwiches.

Sources: US Dept of Health; National Institutes of Health; National Heart, Lung, and Blood Institute; Office of Research on Minority Health

Coronary Artery Bypass Grafting (CABG)

Definition

CABG surgery creates new routes around narrowed and blocked arteries, allowing sufficient blood flow to deliver oxygen and nutrients to the heart muscle.

Characteristics

Arteries or veins from elsewhere in the patient's body are grafted from the aorta to the coronary arteries to bypass atherosclerotic narrowings and improve the blood supply to the coronary circulation supplying the myocardium (heart muscle).

The **goals** of having CABG are to:

- Improve quality of life and decrease angina and other symptoms of CAD,
- Resume a more active lifestyle ,
- Improve the pumping action of the heart if it has been damaged by a heart attack,
- Lower the chances of a heart attack (in some patients, such as those with diabetes), and
- Improve chances of survival.

Full recovery from traditional CABG may take **6 to 12 weeks** or more. Less recovery time is needed for nontraditional CABG.

Functional Considerations

- Post operatively limitations will be extensive.
- Recovery should take 6-12 weeks, though is dependent upon pre-surgery conditions and complications.
- Cognitive issues are common after heart-lung bypass, but should subside after several months.
- A person who has had CABG may require an increase in services following surgery, but is likely to become more functional following full recovery from surgery. Therefore, it may be appropriate to authorize time-limited services.

National Heart Lung and Blood Institute

Coronary Artery Bypass Grafting

What is Coronary Artery Bypass Grafting?

Coronary artery bypass grafting (CABG) is a type of surgery called revascularization, used to improve blood flow to the heart in people with severe coronary artery disease (CAD).

CAD occurs when the coronary arteries that supply blood to the heart muscle become blocked due to the buildup of a material called plaque on the inside of the blood vessels. If the blockage is severe, chest pain (also called angina), shortness of breath, and, in some cases, heart attack can occur.

CABG is one treatment for CAD. During CABG, a healthy artery or vein from another part of the body is connected, or grafted, to the blocked coronary artery. The grafted artery or vein bypasses the blocked portion of the coronary artery. This new passage routes oxygen-rich blood around the blockage to the heart muscle. As many as four major blocked coronary arteries can be bypassed during one surgery.

Overview

CABG is the most common type of open-heart surgery in the United States, with more than 500,000 surgeries performed each year.

CABG isn't used for everyone with CAD. Many people with CAD can be treated by other means, such as lifestyle changes, medicines, and another revascularization procedure called angioplasty.

CABG may be an option if there are severe blockages in the large coronary arteries that supply a major part of the heart muscle with blood—especially if the heart's pumping action has already been weakened.

The goals of having CABG are to:

- Improve quality of life and decrease angina and other symptoms of CAD
- Resume a more active lifestyle
- Improve the pumping action of the heart if it has been damaged by a heart attack
- Lower the chances of a heart attack (in some patients, such as those with diabetes)
- Improve chances of survival

Repeat surgery may be needed if grafted arteries or veins become blocked, or if new blockages develop in arteries that weren't blocked before. Taking medicines as prescribed and making lifestyle changes that your doctor recommends can lower the chance of a graft becoming blocked.

In people who are candidates for the surgery, the results are usually excellent, with 85 percent of people having

- Significantly reduced symptoms,
- Less risk for future heart attacks, and
- A decreased chance of dying within 10 years following the surgery.

CABG is not a cure for coronary artery disease (CAD).

National Heart Lung and Blood Institute

Types of Coronary Artery Bypass Grafting

Traditional Coronary Artery Bypass Grafting	• Most common • Lasts 3 to 5 hours, depending on the number of arteries being bypassed • Used when at least one major artery needs to be bypassed • Chest bone is opened to access the heart • Heart-lung machine is used to keep blood and oxygen moving throughout the body during surgery • Surgeon to operates on a still heart • Heart is restarted using mild electric shocks
Off-Pump Coronary Artery Bypass Grafting	• The chest bone is opened to access the heart • The heart isn't stopped, and a heart-lung machine isn't used • May reduce complications that can occur when a heart-lung machine is used such as infection, stroke, and kidney complications • May speed up recovery time after surgery
Minimally Invasive Direct Coronary Artery Bypass Grafting	• Only require small incisions on the left side of the chest between the ribs rather than opening the chest bone to get to the heart • Used mainly for bypassing the vessels in front of the heart • Fairly new procedure, which is performed less often than the other types • These procedures sometimes use a heart-lung machine • Advantages include smaller incisions, smaller scars, shorter recovery and hospital stay, less bleeding, less chance for infection, and less pain

Other Names for Coronary Artery Bypass Grafting

- Bypass surgery
- Coronary artery bypass surgery
- Heart bypass surgery

Who Needs Coronary Artery Bypass Grafting?

Coronary artery bypass grafting (CABG) is only used to treat people who have severe coronary artery disease (CAD) that could lead to a heart attack.

The doctor may recommend CABG if other treatments, such as lifestyle changes or medicines, haven't worked. He or she also may recommend CABG if there are severe blockages in the large coronary arteries that supply a major part of the heart muscle with blood—especially if the heart's pumping action has already been weakened.

CABG also may be a treatment option if there are blockages in the heart that can't be treated with angioplasty.

Who is a candidate for CABG is based on a number of factors:

- The presence and severity of CAD symptoms,
- The severity and location of blockages in the coronary arteries,
- The patient's response to other treatments,
- Quality of life, and
- Other medical problems.

In some cases, CABG may be performed on an **emergency basis**, such as pending or during a heart attack.

Other Considerations

Medicines and other medical procedures may be tried before CABG. Medicines that lower cholesterol levels and blood pressure and improve blood flow through the coronary arteries are often tried.

A procedure called **coronary angioplasty** (also called balloon angioplasty) may be tried. During this procedure, a thin tube with a balloon or other device on the end is threaded through a blood vessel in the groin (upper thigh) or arm up to the narrowed or blocked coronary artery. Once in place, the balloon is inflated to push the plaque against the wall of the artery, widening the artery and restoring the flow of blood through it. In many cases, after the initial balloon angioplasty, a tiny mesh tube called a stent is inserted permanently in the area to keep the artery open.

What to Expect After Coronary Artery Bypass Grafting

Recovery at Home

Specific instructions are given for recovering at home, especially concerning:

- How to care for the healing incisions
- How to recognize signs of infection or other complications
- When to call the doctor immediately
- When to make follow-up appointments

Instructions are given on how to deal with **common after-effects from surgery**. After-effects often go away within 4 to 6 weeks after surgery, but may include:

- Discomfort or itching from healing incisions
- Swelling of the area where an artery or vein was taken for grafting
- Muscle pain or tightness in the shoulders and upper back
- Fatigue (tiredness), mood swings, or depression
- Difficulty sleeping or loss of appetite
- Constipation
- Chest pain around the site of the chest bone incision (more frequent with the traditional surgery)

Full recovery from traditional CABG may take **6 to 12 weeks** or more. Less recovery time is needed for nontraditional CABG.

Resuming physical activity - varies from person to person, but there are some typical timeframes. Most people can:

- Resume sexual activity within about 4 weeks
- Resume driving after 3 to 8 weeks
- Return to work after 6 weeks – unless the job involves specific and demanding physical activity

Ongoing Care

Care after surgery may include:

- **Periodic checkups** with doctors - during these visits, tests may be done to see how the heart is working. Tests may include EKG, stress testing, and echocardiogram.
- **Lifestyle changes** that include:
  - Quitting smoking,
  - Making changes in diet,
  - Getting regular exercise, and
  - Lowering and managing stress.
- **Cardiac rehabilitation** (rehab) program-these programs provide supervised physical activity and education on how to make choices that reduce risk for future heart problems and help get back to regular lifestyle after surgery

- **Medications** may be prescribed to:
  - Manage pain during recovery
  - Lower cholesterol
  - Lower blood pressure
  - Lower the chance of developing blood clots
  - Manage diabetes
  - Treat depression

What are the Risks of Coronary Artery Bypass Grafting?

Although complications from coronary artery bypass grafting (CABG) are uncommon, the risks include:

- Wound infection and bleeding
- Anesthesia reactions
- Fever
- Pain
- Stroke, heart attack, or even death

Some patients can develop a **fever** associated with chest pain, irritability, and decreased appetite.

- This is due to inflammation involving the lung and heart sac
- Is sometimes seen 1 to 6 weeks after surgeries that involve cutting through the pericardium (the outer covering of the heart)
- This reaction is usually a mild, self-limited illness
- Some patients may develop fluid buildup around the heart that requires treatment

Use of the **heart-lung machine** also can cause complications:

- **Memory loss and difficulty concentrating or thinking clearly** may occur in some people.
  - These changes are more likely to occur in people who are older, who have high blood pressure or lung disease, or who drink excessive amounts of alcohol.
  - These side effects often improve several months after surgery.

- Increase in the **risk of blood clots** forming in the blood vessels.
  - Clots can travel to the brain or other parts of the body and block the flow of blood, which can cause stroke or other problems.
  - Recent technical improvements in heart-lung machines are helping to reduce the risk of blood clots forming.

In general, the chances of developing complications are higher when:

- CABG is done in an emergency situation (for example, if performed during a heart attack),
- If the patient is over age 70, or
- If there is a history of smoking.
- Risks are also higher if the patient has other diseases or conditions such as diabetes, kidney disease, lung disease, or peripheral vascular disease.

Adapted (8-07) from: NHLBI http://www.nhlbi.nih.gov/health/dci/Diseases/cabg/cabg_whatis.html

Diabetes

Definition
Diabetes is a metabolic disorder characterized by hyperglycemia (high blood sugar) and other signs.

Characteristics
Decrease or absence of insulin production in the body.

- Type 1 – must take insulin shots
- Type 2 – may be controlled with diet, oral medications or insulin shots
- Common complications:
    - Heart disease
    - Stroke
    - Kidney disease
    - Neuropathies
    - Retinopathies
    - Gastroparesis
    - Urologic
- Healthy diet and exercise are important to control the disease and prevention of complications.

Functional Considerations

- For most patients newly diagnosed, primary functional issues will be medication management, diet management and exercise.
- Other limitations will relate to system failures.
- Meal prep issues – Diabetic diet is healthy eating; unlikely to require extra prep time.
    - Good questions to ask may include: What is the diet? Does the consumer eat snacks? If a consumer cannot prepare meals (is a Rank 4 or 5), does s/he have a provider every day? If not, consider a referral to the Public Authority or other resource – perhaps Meals on Wheels can augment meal prep to meet the need. Restaurant Meals Allowance may also be an alternative.
- Bathing, oral hygiene and grooming –
    - Drying skin, especially between the toes, and application of lotion to the feet, but not between the toes, is important.
- If the consumer has open, non-healing sores, a doctor may want to order Paramedical care.
- Urination – The consumer may have frequent urination requiring an increase in Bowel and Bladder care. If the consumer cannot get to the toilet/urinal/commode fast enough, there may be the need to make an exception to Domestic and Laundry.
- Exercise is important for controlling blood sugar levels.
- Common Paramedical services –
    - Glucometer blood testing and charting.
    - Insulin injection.
    - Filling syringes for consumer to inject.
- Consumers who are experiencing complications may require frequent visits to primary physicians and/or specialists.

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Diabetes

What is Diabetes?

Diabetes mellitus is a chronic disease in which the pancreas produces too little or no insulin, impairing the body's ability to turn sugar into usable energy. Doctors often use the full name "diabetes mellitus," rather than "diabetes" alone, to distinguish this disorder from diabetes insipidus--a different disease altogether that is characterized by excess urination, but is unrelated to blood sugar.

The number of people diagnosed with diabetes has increased more than sixfold from 1.6 million in 1958 to 10 million in 1997, according to the Centers for Disease Control and Prevention (CDC) in Atlanta. Today, some 16 million people have the disease--making it a leading cause of death in the United States--yet 5 million don't know they have it. And nearly 800,000 new cases of diabetes are diagnosed each year.

There is no cure for the disease, and the resulting health complications from poorly controlled diabetes are what make it so frightening.

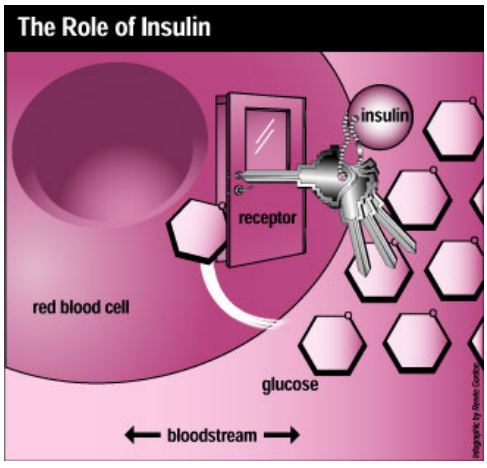
Consistently high blood sugar levels can, over time, lead to blindness, kidney failure, heart disease, limb amputations, and nerve damage. In fact, diabetes is the leading cause of new cases of blindness in adults between the ages of 20 and 74, and it accounts for 40 percent of people who have kidney failure. Cardiovascular disease is 2 to 4 times more common among people with diabetes, and is the leading cause of diabetes-related deaths. The risk of stroke is also 2 to 4 times higher in people with diabetes, and 60 percent to 65 percent have high blood pressure.

Despite these numbers, diabetes can be very well-managed and that people can expect to live full and productive lives. Much of the treatment, however, depends largely on self-care practices. It's important not only to target good behaviors, but also to consistently follow through with them.

Monitoring blood sugar levels is a key component in treatment and management of the disease. Research has indicated that people who keep their blood sugar levels within individual target ranges set by their doctors stand a good chance of reducing the risk of complications from diabetes. Moreover, in many cases intensive lifestyle changes in diet and exercise actually can prevent, reduce or delay the risk of developing one type of the disease.

From: *Diabetes: A Growing Public Health Concern*, Carol Lewis, U.S. Food and Drug Administration, FDA Consumer magazine. January-February 2002

Types of Diabetes



Type 1 diabetes (previously known as insulin-dependent diabetes),

- The insulin-producing cells of the pancreas are destroyed. In most people this destruction is caused by the body's immune system.
- Pancreas cells then do not make any insulin. Insulin is needed to help glucose move from the bloodstream into cells.
- Type 1 diabetics, must take insulin shots to enable the body to use sugar for energy and to keep blood sugar levels within a normal range.

Type 2 diabetes (previously called non-insulin dependent diabetes)

- Beta cells in the pancreas still can produce insulin (is not caused by a problem with the immune system).
- Tissues are insulin resistant (normal amounts of insulin are not adequate to move glucose into the cells, because the muscles, liver and other tissues do not respond sensitively to the insulin that is released).

- The pancreas produces extra insulin to compensate, but eventually is not able to keep up with the need for extra insulin.
- Initially treated with oral medications, usually progress to needing insulin injections.

Pre-diabetes

- Blood glucose levels are higher than normal but not high enough for a diagnosis of diabetes.
- Also called impaired fasting glucose or impaired glucose tolerance.
- Many people with pre-diabetes develop type 2 diabetes within 10 years.
- With modest weight loss and moderate physical activity, people with pre-diabetes can delay or prevent type 2 diabetes and lower their risk of heart disease and stroke.

Characteristics of Type 1 Diabetes	**Characteristics of Type 2 Diabetes**
• Age of onset under 40 years old, most common in children; some older people develop this type. • Thin to normal body weight. • Quick onset with thirst, frequent urination, and weight loss symptoms developing and worsening over days to weeks. • Usually no known family history, but in rare cases there can be. • No major risk factors; risk is increased if strong family history exists. • Usually more than one shot daily of insulin treatment always needed to control diabetes. • Difficult to keep fluctuating blood sugar in ideal range. • Blood sugar is sensitive to small changes in diet, exercise, and insulin dose. • Can be caused by a combination of heredity and exposure to some factor during life that triggers autoimmune destruction of the insulin-producing beta cells in the pancreas.	• Age of onset over 40 years old, most common in adults; some younger people develop this type. • Overweight; occasionally occurs in people of normal weight. • Usually slow onset with thirst, frequent urination, and weight loss symptoms developing over weeks to months, or even years. • Can be "silent disease". • Usually runs in families. • Treatment usually begins with diet and exercise, progressing to pills and later to insulin. • Easier to control without fluctuating blood sugar range. • Blood sugar may respond to weight loss, and/or change in diet and exercise; blood sugar may be less responsive to small changes in insulin dose. • Can be caused by combination of heredity, insulin resistance, and deficiency of the insulin-producing beta cells of the pancreas.

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Symptoms to Report to the Doctor

The following symptoms can be a sign of an emergency; the patient should contact the doctor right away.

Symptom	Risk
Very high blood sugar (more than 400 milligrams per deciliter (mg/dl)	High risk of dehydration and may require intravenous fluids if glucose levels are not lowered quickly. A sugar this high may be a sign of infection if diabetes is usually in better control.
Frequently hypoglycemic episodes, with or without these typical symptoms: • Trembling • Sweating • Anxiety • Blurred vision • Rapid heartbeat • Difficulty concentrating • Weakness • Headache	Need an adjustment in medication dose. Low-blood-sugar episodes can be dangerous. Should not wait until the next scheduled appointment to discuss this problem with the doctor.
Fever higher than 101 degrees	Needs to be evaluated in case of serious infection.
Episode of : • Chest pain or pressure • Shortness of breath • Arm or neck tingling or numbness • Nausea • Sweating	These can be symptoms of a heart attack. Call for emergency help.
Episode of: • Confusion • Speech difficulty • Weakness on one side • Difficulty walking • Dimming, blurring, or loss of vision • An unusual or severe headache	These can be symptoms of a stroke. Call for emergency help.

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Steps to stay healthy with diabetes?


Follow a healthy eating plan that the doctor or dietitian have worked out.


Be active a total of 30 minutes most days.


Take medications as directed.

Check blood glucose every day and keep a record of trends.


Check feet every day for cuts, blisters, sores, swelling, redness, or sore toenails.


Brush and floss teeth every day.


Control blood pressure and cholesterol.


Don't smoke.

ABCs of Diabetes

A stands for A1C (a test that measures blood glucose control). Have an A1C test at least twice a year. It shows average blood glucose level over the past 3 months.

A1C target
Below 7 percent

Blood glucose targets	
Before meals	90 to 130 mg/dL
1 to 2 hours after the start of a meal	Less than 180 mg/dL

B is for blood pressure. Have it checked at every office visit.

Blood pressure target
Below 130/80 mm Hg

C is for cholesterol. Have it checked at least once a year.

Blood fat (cholesterol) targets	
LDL (bad) cholesterol	Under 100 mg/dL
Triglycerides	Under 150 mg/dL
HDL (good) cholesterol **For men:** above 40 mg/dL **For women:** above 50 mg/dL	

Control of the ABCs of diabetes can reduce the risk for heart disease and stroke.

Other Problems that can Change Blood Sugar

Besides diabetes, there are many things that can interfere with insulin response and glucose control.

Increase in blood-glucose level

Infections — While the immune system fights any infection, the body produces hormones that interfere with insulin production and insulin effect.

Severe illness — Heart attacks or other significant body stresses can trigger the body to produce "stress hormones" that interfere with insulin production and insulin effect.

Obesity — Insulin resistance increases with weight gain.

Thyroid disease—This hormone imbalance can increase blood sugar.

Medicines — Certain medications can elevate blood-sugar levels.

Corticosteroids	• Prednisone or other corticosteroid pills • Anti-inflammatory medicines used for joint injections • Some inhalers for asthma or chronic lung disease if used in high doses • Dermatology creams or ointments if used in large quantities
Olanzipine (Zyprexa	• Used to treat psychiatric illness, particularly schizophrenia
Thiazide diuretics	• Used to treat blood pressure or fluid retention
Beta-agonists	• Pills or inhalers containing albuterol
Niacin	• Used for cholesterol treatment
Dilantin	• Used for seizure treatment
Thyroid hormone replacement	• Especially if dose is incorrect for patient
Pentamidine	• An antibiotic
Alpha interferon	• Used to treat hepatitis or cancer

Decrease in blood-glucose level (Hypogylycemia)

Medications

Medications, including some used to treat diabetes, are the most common cause of hypoglycemia. Other medications that can cause hypoglycemia include:

salicylates	including aspirin, when taken in large doses
sulfa medicines	used to treat infections
pentamidine	treats a very serious kind of pneumonia
quinine	used to treat malaria

Alcohol

Drinking, especially binge drinking, can cause hypoglycemia because the body's breakdown of alcohol interferes with the liver's efforts to raise blood glucose. Hypoglycemia caused by excessive drinking can be very serious and even fatal.

Critical Illnesses

- Some illnesses that affect the liver, heart, or kidneys can cause hypoglycemia.
- Sepsis (overwhelming infection) and
- Starvation

Hormonal Deficiencies

Hormonal deficiencies may cause hypoglycemia in very young children, but usually not in adults. Shortages of cortisol, growth hormone, glucagon, or epinephrine can lead to fasting hypoglycemia. Laboratory tests for hormone levels will determine a diagnosis and treatment. Hormone replacement therapy may be advised.

Tumors

Insulinomas, insulin-producing tumors, can cause hypoglycemia by raising insulin levels too high in relation to blood glucose levels. These tumors are very rare and do not normally spread to other parts of the body. Laboratory tests can pinpoint the exact cause. Treatment involves both short-term steps to correct the hypoglycemia and medical or surgical measures to remove the tumor.

Advances at a Glance

- **GlucoWatch:** Glucose monitoring device worn like a watch; detects blood glucose levels through the skin; must be calibrated to a glucose meter; approved March 2001. Cygnus Inc., Redwood City, Calif.

- **Sof-Tact**: Semi-automated home blood glucose monitor that uses light suction vacuum to hold skin in place while integrated apparatus lances skin. Device automatically transfers small amount of blood to a biosensor strip, and blood glucose test result is delivered in 20 seconds. Eliminates need for traditional finger-stick method; can be used on forearm or upper arm; approved November 2000. Abbott Laboratories, Abbott Park, Ill.

- **Continuous Glucose Monitoring System:** Continuous measure of tissue glucose levels in adults with diabetes. Records levels at five-minute intervals for up to three days; information is then downloaded on computer for review by health-care practitioner; must be used in conjunction with finger-stick tests; approved June 1999. MiniMed Inc., Sylmar, Calif.

- **Lasette:** Portable, battery-operated laser; means for drawing blood without using traditional lancets (small, razor-sharp devices for puncturing skin); for adults and children; approved December 1998. Cell Robotics International Inc., Albuquerque, N.M.

- **Q-103 Needle Management System:** Used to remove certain hypodermic needles from insulin syringes and store them safely for later disposal; device holds up to 5000 removed needles; approved December 2000. QCare International LLC, Marietta, Ga.

- **Apligraf:** Wound dressing that helps heal diabetic foot ulcers, open foot sores that can lead to amputation; approved June 2000. Organogenesis Inc., Canton, Mass.

- **Dermagraft:** Skin substitute used to help in the wound closure of diabetic foot ulcers; helps replace and rebuild damaged tissue in diabetic foot ulcers; approved September 2001. Advanced Tissue Sciences, La Jolla, Calif.

- **Other devices:** Over 100 glucose meters and several external insulin pumps approved in the last several years.

From: *Diabetes: A Growing Public Health Concern*, Carol Lewis, U.S. Food and Drug Administration, FDA Consumer magazine. January-February 2002

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Insulin Preparations

Since 1982, most of the newly approved insulin preparations have been produced by inserting portions of DNA ("recombinant DNA") into special lab-cultivated bacteria or yeast. This process allows the bacteria or yeast cells to produce complete human insulin. Recombinant human insulin has, for the most part, replaced animal-derived insulin, such as pork and beef insulin. More recently, insulin products called "insulin analogs" have been produced so that the structure differs slightly from human insulin (by one or two amino acids) to change onset and peak of action. The following table lists some of the more common insulin preparations available today. Onset, peak, and duration of action are approximate for each insulin product, as there may be variability depending on each individual, the injection site, and the individual's exercise program.

Type of Insulin	Examples	Onset of Action	Peak of Action	Duration of Action
Rapid-acting	Humalog (lispro) Eli Lilly	15 minutes	30-90 minutes	3-5 hours
	NovoLog (aspart) Novo Nordisk	15 minutes	40-50 minutes	3-5 hours
Short-acting (Regular)	Humulin R Eli Lilly Novolin R Novo Nordisk	30-60 minutes	50-120 minutes	5-8 hours
Intermediate-acting (NPH)	Humulin N Eli Lilly Novolin N Novo Nordisk	1-3 hours	8 hours	20 hours
	Humulin L Eli Lilly Novolin L Novo Nordisk	1-2.5 hours	7-15 hours	18-24 hours

Intermediate- and short-acting mixtures	Humulin 50/50 Humulin 70/30 Humalog Mix 75/25 Humalog Mix 50/50 Eli Lilly Novolin 70/30 Novolog Mix 70/30 Novo Nordisk	The onset, peak, and duration of action of these mixtures would reflect a composite of the intermediate and short- or rapid-acting components, with one peak of action.		
Long-acting	Ultralente Eli Lilly	4-8 hours	8-12 hours	36 hours
	Lantus (glargine) Aventis	1 hour	none	24 hours

FDA/Office of Public Affairs
Web page created by clb 2001-DEC-26.
http://www.fda.gov/fdac/features/2002/chrt_insulin.html

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Oral Antidiabetes Medications

Category	Action	Generic Name	Brand Name	Manufacturer	Approval Date	Comments
Sulfonylurea	Stimulates beta cells to release more insulin	Chlorpropamide	Diabinese	Pfizer	10/58	Generally taken one to two times daily, before meals; can have interactions with other drugs. First generation sulfonylurea (older drug)
		Glipizide	Glucotrol	Pfizer	5/84	Second generation used in smaller doses than first generation
		Glyburide	DiaBeta/ Micronase/Glynase	Aventis, Pharmacia and Upjohn	5/84	
		Glimepiride	Amaryl	Aventis	11/95	
Meglitinide	Works with similar action to sulfonylureas	Repaglinide	Prandin	Novo Nordisk	12/97	Taken before each of three meals
Nateglinide	Works with similar action to sulfonylureas	Nateglinide	Starlix	Novartis	12/00	Taken before each of three meals

Biguanide	Sensitizes the body to the insulin already present	Metformin	Glucophage	Bristol Myers Squibb	3/95	Taken two times daily with food for best results
		Metformin (long lasting)	Glucophage XR	Bristol Myers Squibb	10/00	
		Metformin with glyburide	Glucovance	Bristol Myers Squibb	7/00	
Thiazolidinedione (Glitazone)	Helps insulin work better in muscle and fat; lowers insulin resistance	Rosiglitazone	Avandia	SmithKline Beecham (now GlaxoSmithKline)	5/99	Taken once or twice daily with food; very rare but serious effect on liver
		Pioglitazone	Actos	Takeda Pharmaceuticals	7/99	
Alpha-Glucose Inhibitor	Slows or blocks the breakdown of starches and certain sugars; action slows the rise in blood sugar levels following a meal.	Acarbose	Precose	Bayer	9/95	Should be taken with first bite of meal
		Miglitol	Glyset	Pharmacia and Upjohn	12/96	

FDA/Office of Public Affairs
Web page created by clb 2001-DEC-26.
http://www.fda.gov/fdac/features/2002/chrt_oralmeds.html

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Insulin

How often?
Most people with diabetes need at least two insulin shots a day for good blood glucose control. Some people take three or four shots a day to have a more flexible diabetes plan.

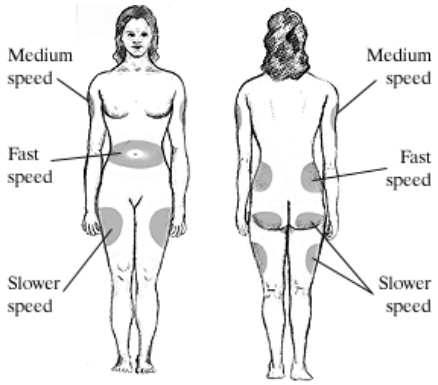
When?
Take insulin 30 minutes before a meal if using regular insulin alone or with a longer-acting insulin. If using rapid-acting insulin, shot should be given just before eating.

Are there different types of insulin?
Yes. There are six main types of insulin. They each work at different speeds. Many people take two types of insulin.

Does insulin work the same all the time?
After a short time, the patient will get to know when their insulin starts to work, when it works its hardest to lower blood glucose, and when it finishes working.

How quickly or slowly insulin works in the body depends on:

- individual response
- where insulin is injected
- the type and amount of exercise
- length of time between shot and exercise



Insulin injection sites.

- Insulin injected near the stomach works fastest.
- Insulin injected into the thigh works slowest.
- Insulin injected into the arm works at medium speed.

Storing insulin.

- Insulin is good out of refrigerator for 30 days. If expected to use in more that 30 days must refrigerate. Discard un-refrigerated insulin after 30 days. Hint: On the label, write expiration date for reminder.
- If insulin gets too hot or cold, it breaks down and does not work. Do not keep insulin in very cold places such as the freezer, or in hot places, such as by a window or in the car's glove compartment during warm weather.
- Keep at least one extra bottle of each type of insulin used. Store extra insulin in the refrigerator.

Hypoglycemia (low blood sugar)
Sulfonylureas, meglitinides, D-phenylalanine derivatives, combination oral medicines, and insulin are the types of diabetes medicines that can make blood glucose go too low. Hypoglycemia can happen for many reasons:

- delaying or skipping a meal
- eating too little food at a meal
- getting more exercise than usual
- taking too much diabetes medicine
- drinking alcohol

Symptoms of hypoglycemia include

- hunger
- nervousness and shakiness
- perspiration
- dizziness or light-headedness

- sleepiness
- confusion
- difficulty speaking
- feeling anxious or weak

Hypoglycemia can also happen while sleeping. Signs might include:

- cry out or have nightmares
- find that pajamas or sheets are damp from perspiration
- feel tired, irritable, or confused when wake up

If showing signs of hypoglycemia, test blood glucose. If blood glucose is at or below 70 mg/dL, have one of these items to get 15 grams of carbohydrate:

- 1/2 cup (4 oz.) of any fruit juice
- 1 cup (8 oz.) of milk
- 1 or 2 teaspoons of sugar or honey
- 1/2 cup (4 oz.) of regular soda
- 5 or 6 pieces of hard candy
- glucose gel or tablets (take the amount noted on the package to add up to 15 grams of carbohydrate)

Test blood glucose again 15 minutes later. If it is still below 70 mg/dL, then eat another 15 grams of carbohydrate. Then test r blood glucose again in 15 minutes.

If blood glucose is not low, and their next meal is at least an hour away they should have a snack with starch and protein. Here are some examples:

- crackers and peanut butter or cheese
- half of a ham or turkey sandwich
- a cup of milk and crackers or cereal

If the patient feels symptoms of hypoglycemia but cannot test their blood glucose right away they should eat one of the items listed above.

Normal and target blood glucose ranges (mg/dL)

Normal blood glucose levels in people who do not have diabetes	
Upon waking (fasting)	70 to 110
After meals	70 to 140
Target blood glucose levels in people who have diabetes	
Before meals	90 to 130
1 to 2 hours after the start of a meal	less than 180
Hypoglycemia (low blood glucose)	70 or below

Adapted (8-07) from NIH Publication No. 03–4222 (December 2002) and NIH Publication No. 03–3926 (March 2003) National Diabetes Information Clearinghouse www.niddk.nih.gov

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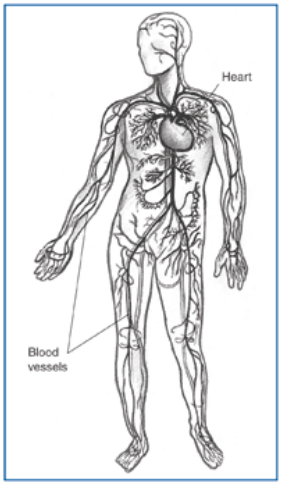
Complications of Diabetes

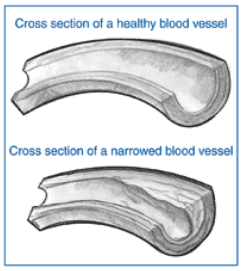
Heart Disease and Stroke



Having diabetes or pre-diabetes increases the risk for heart disease and stroke. Risk can be lowered by blood glucose, blood pressure, and blood cholesterol close to the recommended target numbers—the levels suggested by diabetes experts for good health. Reaching these targets also can help prevent narrowing or blockage of the blood vessels in the legs, a condition called peripheral arterial disease.

What is the connection between diabetes, heart disease, and stroke?

Diabetics are at least twice as likely as someone who does not have diabetes to have heart disease or a stroke. People with diabetes also tend to develop heart disease or have strokes at an earlier age than other people. Some studies suggest that a middle-aged person with type 2 diabetes chance of having a heart attack is as high as someone without diabetes who has already had one heart attack. Women who have not gone through menopause usually have less risk of heart disease than men of the same age. But women of all ages with diabetes have an increased risk of heart disease because diabetes cancels out the protective effects of being a woman in her child-bearing years.



People with diabetes who have already had one heart attack run an even greater risk of having a second one. In addition, heart attacks in people with diabetes are more serious and more likely to result in death. High blood glucose levels over time can lead to increased deposits of fatty materials on the insides of the blood vessel walls. These deposits may affect blood flow, increasing the chance of clogging and hardening of blood vessels (atherosclerosis).

What are the risk factors for heart disease and stroke in people with diabetes?

- **Diabetes itself** is a risk factor for heart disease and stroke.
- **Family history of heart disease.** If one or more members of a family had a heart attack at an early age (before age 55 for men or 65 for women), increases risk.
- **Having central obesity.** Central obesity means carrying extra weight around the waist, as opposed to the hips. A waist measurement of more than 40 inches for men and more than 35 inches for women defines central obesity. Risk of heart disease is higher because abdominal fat can increase the production of LDL (bad) cholesterol, the type of blood fat that can be deposited on the inside of blood vessel walls.
- **Having abnormal blood fat (cholesterol) levels.**
  –High levels of LDL cholesterol raise risk of getting heart disease.
  –Triglycerides are another type of blood fat that can raise risk of heart disease when the levels are high.
  –Low levels of HDL cholesterol increase risk for heart disease.
- **Having high blood pressure.** High blood pressure can strain the heart, damage blood vessels, and increase risk of heart attack, stroke, eye problems, and kidney problems.
- **Smoking.** Smoking doubles risk of getting heart disease, eye complications and peripheral vascular disease.

What types of heart and blood vessel disease occur in people with diabetes?

- coronary artery disease (CAD)
- cerebral vascular disease
- heart failure
- peripheral arterial disease – narrowing or blockage of the blood vessels in the legs

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Neuropathies

Diabetic neuropathies are a family of nerve disorders caused by diabetes. People with diabetes can, over time, have damage to nerves throughout the body. Neuropathies lead to numbness and sometimes pain and weakness in the hands, arms, feet, and legs. Problems may also occur in every organ system, including the digestive tract, heart, and sex organs. People with diabetes can develop nerve problems at any time, but the longer a person has diabetes, the greater the risk.

An estimated 50 percent of those with diabetes have some form of neuropathy, but not all with neuropathy have symptoms. The highest rates of neuropathy are among people who have had the disease for at least 25 years.

Diabetic neuropathy also appears to be more common in people who have had problems controlling their blood glucose levels, in those with high levels of blood fat and blood pressure, in overweight people, and in people over the age of 40. The most common type is peripheral neuropathy, also called distal symmetric neuropathy, which affects the arms and legs.

Causes

Nerve damage is likely due to a combination of factors:

- metabolic factors, such as high blood glucose, long duration of diabetes, possibly low levels of insulin, and abnormal blood fat levels
- neurovascular factors, leading to damage to the blood vessels that carry oxygen and nutrients to the nerves
- autoimmune factors that cause inflammation in nerves
- mechanical injury to nerves, such as carpal tunnel syndrome
- inherited traits that increase susceptibility to nerve disease
- lifestyle factors such as smoking or alcohol use

Symptoms

Often, symptoms are minor at first, and since most nerve damage occurs over several years, mild cases may go unnoticed for a long time.

Symptoms may include:

- numbness, tingling, or pain in the toes, feet, legs, hands, arms, and fingers
- wasting of the muscles of the feet or hands
- indigestion, nausea, or vomiting
- diarrhea or constipation
- dizziness or faintness due to a drop in postural blood pressure
- problems with urination
- erectile dysfunction (impotence) or vaginal dryness
- weakness

In addition, the following symptoms are not due to neuropathy but nevertheless often accompany it:

- weight loss
- depression

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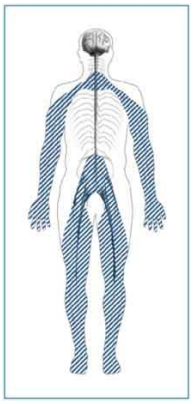
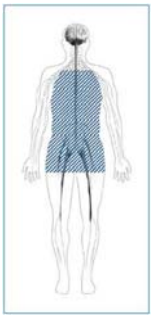
Types of Diabetic Neuropathy
Diabetic neuropathies can be classified as peripheral, autonomic, proximal, and focal. Each affects different parts of the body in different ways.

Peripheral Neuropathy causes either pain or loss of feeling in: ▪ toes ▪ feet ▪ legs ▪ hands ▪ arms 	**Signs and Symptoms:** ▪ Numbness or insensitivity to pain or temperature ▪ A tingling, burning, or prickling sensation ▪ Sharp pains or cramps ▪ Extreme sensitivity to touch, even a light touch ▪ Loss of balance and coordination These symptoms are often worse at night. **Other Concerns:** ▪ Muscle weakness and loss of reflexes, especially at the ankle, leading to changes in gait (walking) ▪ Foot deformities, such as hammertoes and the collapse of the midfoot, may occur. ▪ Blisters and sores may appear on numb areas of the foot because pressure or injury goes unnoticed. If foot injuries are not treated promptly, the infection may spread to the bone, and the foot may then have to be amputated.
Autonomic Neuropathy causes changes in: ▪ heart and blood vessels ▪ digestive system ▪ urinary tract ▪ sex organs ▪ sweat glands ▪ eyes  Can also cause hypoglycemia unawareness, a condition in which people no longer experience the warning signs of hypoglycemia.	**Signs and Symptoms**: ▪ Sharp drop in blood pressure after sitting or standing – dizzy and lightheaded, can faint. ▪ Rapid heart rate unable to respond to activity changes. ▪ Constipation ▪ Frequent uncontrolled diarrhea – leading to weight loss ▪ Gastroparesis – very slow stomach emptying leading to: persistent nausea and vomiting, bloating, and loss of appetite. Fluctuating glucose levels. ▪ Urinary incontinence ▪ Difficulty in emptying bladder ▪ Inability to sweat or profuse sweating ▪ Poor pupil response to light
Proximal Neuropathy causes pain in the: ▪ thighs ▪ hips ▪ buttocks Leads to weakness in the legs.	**Signs and Symptoms:** ▪ Starts with pain in either the thighs, hips, buttocks, or legs, usually on one side of the body. ▪ Weakness in the legs, manifested by an inability to go from a sitting to a standing position without help ▪ More common in those with type 2 diabetes and in older people
Focal Neuropathy results in the sudden weakness of one nerve, or a group of nerves, causing muscle weakness or pain. Any nerve in the body may be affected. Often seen in: ▪ eyes ▪ facial muscles ▪ ears ▪ pelvis and lower back ▪ thighs ▪ abdomen	**Signs and Symptoms:** ▪ Inability to focus the eye ▪ Double vision ▪ Aching behind one eye ▪ Paralysis on one side of the face (Bell's palsy) ▪ Severe pain in the lower back or pelvis ▪ Pain in the front of a thigh ▪ Pain in the chest, stomach, or flank ▪ Pain on the outside of the shin or inside the foot ▪ Chest or abdominal pain that is sometimes mistaken for heart disease, heart attack, or appendicitis

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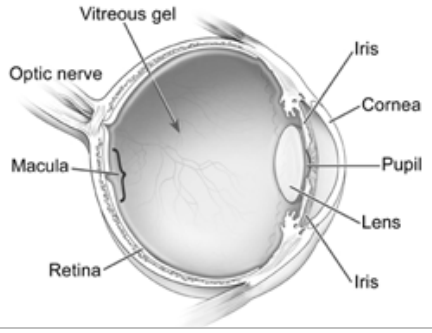
Treatment

- Treatment first involves bringing blood glucose levels within the normal range. Good blood glucose control may help prevent or delay the onset of further problems.
- Foot care is another important part of treatment. People with neuropathy need to inspect their feet daily for any injuries. Untreated injuries increase the risk of infected foot sores and amputation.
- Treatment also includes pain relief and other medications as needed, depending on the type of nerve damage.

Eye Disease

Diabetic eye disease refers to a group of eye problems that people with diabetes may face as a complication of diabetes. All can cause severe vision loss or even blindness.



Cataract—clouding of the eye's lens. Cataracts develop at an earlier age in people with diabetes.	**Signs and Symptoms:** ▪ Cloudy vision **Treatment:** ▪ Surgery to remove and replace the lens
Glaucoma—increase in fluid pressure inside the eye that leads to optic nerve damage and loss of vision. A person with diabetes is nearly twice as likely to get glaucoma as other adults	**Signs and Symptoms:** ▪ Damage first causes loss of sight from the sides of the eyes. **Treatment:** ▪ Treating glaucoma is usually simple with use of rx eye drops to lower the pressure in the eye. ▪ Or may warrant laser surgery
Diabetic retinopathy—damage to the blood vessels in the retina.   **Above:** normal vision **Below:** same scene viewed by a person with diabetic retinopathy.	**Signs and Symptoms:** Often there are no symptoms in the early stages of the disease, nor is there any pain. Patients should have a comprehensive dilated eye exam at least once a year. ▪ Blurred vision may occur when the macula—the part of the retina that provides sharp central vision—swells from leaking fluid. This condition is called macular edema. ▪ If new blood vessels grow on the surface of the retina, they can bleed into the eye and block vision. These will look like floating spots in the eye. **Treatment:** ▪ No treatment for early disease progression ▪ Laser treatments for bleeding and macular edema. ▪ Vitrectomy for severe bleeding – replace vitreous gel with saline solution

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Kidney Disease

Diabetes is the most common cause of kidney failure, accounting for nearly 45 percent of new cases. Even when diabetes is controlled, the disease can lead to nephropathy and kidney failure. Most people with diabetes do not develop nephropathy that is severe enough to cause kidney failure. About 18 million people in the United States have diabetes, and more than 150,000 people are living with kidney failure as a result of diabetes.
Overall, kidney damage rarely occurs in the first 10 years of diabetes, and usually 15 to 25 years will pass before kidney failure occurs. For people who live with diabetes for more than 25 years without any signs of kidney failure, the risk of ever developing it decreases.

Hypertension is a large causative factor.

Signs and Symptoms

- Decrease in filtration of wastes in kidney causing spilling of proteins in urine and retaining wastes in the blood.
- Increased Creatinine blood levels can result in hypertension.
- Signs of worsening kidney disease:
    - need to urinate more often or less often
    - feeling tired or itchy
    - losing appetite or experiencing nausea and vomiting
    - hands or feet may swell or feel numb
    - increased drowsy or have trouble concentrating
    - skin may darken
    - muscle cramps.

Treatment

- Control hypertension
- Moderate protein intake in the diet
- Intensive management of blood glucose
- Dialysis
- Transplantation

Urologic Problems

Bladder dysfunction can have a profound effect on quality of life. Diabetes can damage the nerves that control bladder function. Urologic problems for men and women with diabetes include:

- neurogenic bladder
- urinary tract infections

Neurogenic Bladder

In neurogenic bladder, damage to the nerves that go to the bladder can cause it to release urine when not intended, resulting in leakage. Or damage to nerves may prevent the bladder from releasing urine properly and it may be forced back into the kidneys, causing kidney damage or urinary tract infections.

Neurogenic bladder can be caused by diabetes or other diseases, accidents that damage the nerves, or infections.

Symptoms

- Urinary tract infections
- Loss of the urge to urinate when the bladder is full
- Leakage of urine
- Inability to empty the bladder

Treatment
- Medications
- Catheterization if unable to empty bladder
- Bladder training – using timing techniques
- Surgery

Urinary Tract Infections
Most often a result of neurogenic bladder issues

Symptoms
- a frequent urge to urinate
- pain or burning in the bladder or urethra during urination
- cloudy or reddish urine
- fatigue or shakiness
- in women, pressure above the pubic bone
- in men, a feeling of fullness in the rectum
- If the infection is in the kidneys, there may be nauseous, feel pain in the back or side, and have a fever.

Since frequent urination can also be a sign of high blood glucose, so it is a good idea to evaluate recent blood glucose monitoring results.

Sexual Problems
The nerve damage of diabetes may cause sexual or urologic problems.
- Sexual problems for men with diabetes include:
  - erectile dysfunction
  - retrograde ejaculation
- Sexual problems for women with diabetes include:
  - decreased sexual response
  - decreased vaginal lubrication

Gastroparesis
Also called **delayed gastric emptying**, is a disorder in which the stomach takes too long to empty its contents. Gastroparesis occurs when nerves to the stomach are damaged or stop working due to long term effects of high blood glucose levels. High blood glucose causes chemical changes in nerves and damages the blood vessels that carry oxygen and nutrients to the nerves.

The **vagus nerve** controls the movement of food through the digestive tract. If the vagus nerve is damaged, the muscles of the stomach and intestines do not work normally, and the movement of food is slowed or stopped.

If food lingers too long in the stomach, it can cause problems like **bacterial overgrowth** from the **fermentation of food**. Also, the food can harden into solid masses called **bezoars** that may cause nausea, vomiting, and obstruction in the stomach. Bezoars can be dangerous if they block the passage of food into the small intestine.

Gastroparesis can make diabetes worse by adding to the difficulty of controlling blood glucose. When food that has been delayed in the stomach finally enters the small intestine and is absorbed, blood glucose levels rise. Since gastroparesis makes stomach emptying unpredictable, a person's blood glucose levels can be erratic and difficult to control.

Signs and Symptoms
- Heartburn
- Nausea
- Vomiting of undigested food
- An early feeling of fullness when eating

- Weight loss
- Abdominal bloating
- Erratic blood glucose levels
- Lack of appetite
- Gastroesophageal reflux
- Spasms of the stomach wall

These symptoms may be mild or severe, depending on the person.

Treatment

Insulin for blood glucose control	May need to ▪ take insulin more often ▪ take insulin after eating instead of before ▪ check blood glucose levels frequently after eating and administer insulin whenever necessary
Medications	Metoclopramide (Reglan). ▪ stimulates stomach muscle contractions to help empty food. ▪ reduces nausea and vomiting Erythromycin - antibiotic ▪ improves stomach emptying. It works by increasing the contractions that move food through the stomach. Other medications used to treat symptoms and problems ▪ antiemetic can help with nausea and vomiting. ▪ antibiotics will clear up a bacterial infection. ▪ the doctor may use an endoscope to inject medication that will dissolve a bezoar, it.
Meal and Food Changes	▪ six small meals a day ▪ several liquid meals a day until blood glucose levels are stable ▪ avoid high-fat and high-fiber foods
Feeding Tube (jejunostomy tube)	▪ nutrients directly into the small intestine, bypassing the stomach ▪ nutrients and medication go directly into the small intestine altogether ▪ for severe disease
Parenteral Nutrition	▪ delivers nutrients directly into the bloodstream, bypassing the digestive system. ▪ for severe disease
New Treatments	▪ gastric neurostimulator o battery-operated device is surgically implanted and emits mild electrical pulses that help control nausea and vomiting ▪ botulinum toxin o improve stomach emptying and the symptoms o injected into pyloric sphincter o decreases prolonged contraction

Adapted (8-07) from the following NIH Publications: No. 02–3185 (May 2002); No. 04–5135(June 2004): No. 07–3925 (October 2006): No. 04–4348 (December 2003) National Diabetes Information Clearinghouse www.niddk.nih.gov and from the National Eye Institute www.nei.nih.gov

NIDDK

Foot Care

People with neuropathy need to take special care of their feet. The nerves to the feet are the longest in the body and are the ones most often affected by neuropathy. Loss of sensation in the feet means that sores or injuries may not be noticed and may become ulcerated or infected. Circulation problems also increase the risk of foot ulcers.

More than half of all lower limb amputations in the United States occur in people with diabetes—86,000 amputations per year. Doctors estimate that nearly half of the amputations caused by neuropathy and poor circulation could have been prevented by careful foot care. Here are the steps to follow:

- Clean regularly, using warm—not hot—water and a mild soap. Avoid soaking feet. Dry them with a soft towel; dry carefully between toes.
- Inspect feet and toes frequently for cuts, blisters, redness, swelling, calluses, or other problems. Have the patient see a mirror (laying a mirror on the floor works well) or get help from someone else if they cannot see the bottoms of the feet. Notify health care provider of any problems.
- Moisturize feet with lotion, but avoid getting it between toes.
- After a bath or shower, file corns and calluses gently with a pumice stone.
- When needed, cut toenails to the shape of the toes and file the edges with an emery board.
- Always wear shoes or slippers to protect feet from injuries. Prevent skin irritation by wearing thick, soft, seamless socks.
- Wear shoes that fit well and allow toes to move. Break in new shoes gradually by wearing them for only an hour at a time at first.
- Before putting shoes on, look them over carefully and feel the insides with a hand to make sure they have no tears, sharp edges, or objects in them that might injure the feet.
- If help is needed make an appointment to see a foot doctor, also called a podiatrist.

For additional information on foot care, contact the National Diabetes Information Clearinghouse at 1–800–860–8747. Materials are also available at ndep.nih.gov/resources/health.htm.

Eating and Diabetes

Eating Healthy and Staying Fit to Control and Manage Diabetes

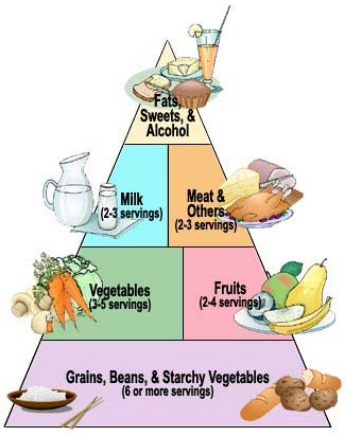
Steps to healthy eating and a healthy lifestyle to control and manage diabetes:
Begin with a healthy eating plan. Healthy eating means eating more grains, fruits, and vegetables, and less meat, sweets, and fats every day. "Let the Food be the Medicine and Medicine be the Food" (Hippocrates).

Be physically active every day to help prevent weight gain and improve blood sugar control.
Check blood sugar and take medication every day if needed.

How to Create a Healthy Meal Plan

A healthy meal plan should include the following:

- Eat a variety of foods as recommended in the **Diabetes Food Pyramid** to get a balanced intake of the nutrients - carbohydrates, proteins, fats, vitamins, and minerals.
- Make changes gradually because it takes time to accomplish lasting goals.
- Reduce the amount of fat by choosing fewer high-fat foods and cooking with less fat.
- Eat more fiber by eating at least 5 servings of fruits and vegetables every day.
- Eat fewer foods that are high in sugar like fruit juices, fruit-flavored drinks, sodas, and tea or coffee sweetened with sugar.



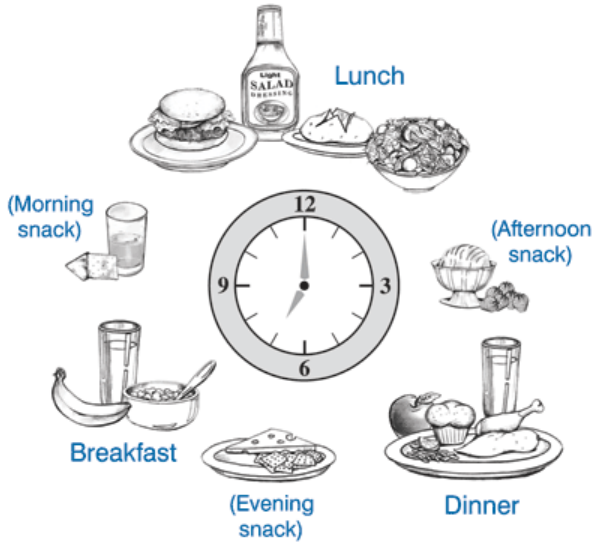
- Use less salt in cooking and at the table. Eat fewer foods that are high in salt, like canned and packaged soups, pickles, and processed meats.
- Eat smaller portions and never skip meals.
- Learn about the right serving sizes.
- Learn how to read food labels.
- Limit use of alcohol.

What is the Diabetes Food Pyramid?
The **Diabetes Food Pyramid** is a general guide of what and how much to eat each day. It is similar to the Food Pyramid seen on many food packages. The pyramid is divided into six groups. More foods should be eaten from the largest group at the base of the pyramid and less from the smaller groups at the top of the pyramid. The number of servings needed every day is not the same for everyone, so a range of servings is given to ensure the right food combinations for each person. The food groups and suggested servings per day are listed below.

 **Grains, Beans, and Starchy Vegetables: 6 or more servings/day** (good source of B vitamins and fiber) ▪ Choose whole-grain foods such as whole-grain bread or crackers, tortillas, bran cereal, brown rice, or bulgar. They're nutritious and high in fiber. ▪ Choose beans as a good source of fiber. ▪ Use whole-wheat or other whole-grain flours in cooking and baking. ▪ Eat more low-fat beads such as bagels, tortillas, English muffins, and pita bread. ▪ For snacks, try pretzels or low-fat crackers	**A serving can be:** ▪ 1 slice bread ▪ 1/2 small bagel, English muffin, or pita bread ▪ 1/2 hamburger or hot dog bun ▪ 1 6-inch tortilla ▪ 4 to 6 crackers ▪ 1/2 cup cooked cereal, pasta, or bulgur ▪ 1/3 cup cooked rice ▪ 3/4 cup dry cereal ▪ 1/2 cup cooked beans, lentils, peas, or corn ▪ 1 small potato ▪ 1 cup winter squash ▪ 1/2 cup sweet potato or yam
 **Fruits: 2-4 servings/day** (contain vitamins C, A, potassium, folate, and fiber) ▪ Choose whole fruits more often than juices. They have more fiber. ▪ Choose fruits and fruit juices without added sweeteners or syrups. ▪ Choose citrus fruit such as oranges, grapefruit, or tangerines.	**A serving can be:** ▪ 1 small fresh fruit ▪ 1/2 cup canned fruit ▪ 1/4 cup dried fruit ▪ 1/2 cup fruit juice
 **Vegetables**: **3-5 servings/day** (provide vitamins A, C, folate, and fiber) ▪ Choose fresh or frozen vegetables without added sauces, fats, or salt. ▪ Choose more dark green and deep yellow vegetables, such as spinach, broccoli, romaine, carrots, chilies, and peppers.	**A serving can be:** ▪ 1 cup raw vegetables ▪ 1/2 cup cooked vegetables ▪ 1/2 cup tomato or vegetable juice
 **Milk: 2-3 servings/day** (source of calcium, protein, vitamins A and D) ▪ Choose low-fat or nonfat milk or yogurt. Yogurt has natural sugar in it. It can also have added sugar or artificial sweeteners. Yogurt with artificial sweeteners has fewer calories than yogurt with added sugar.	**A serving can be:** ▪ 1 cup milk ▪ 1 cup yogurt

 **Meats and Others: 2-3servings/day** (good source of iron, zinc, B vitamins, and protein) ▪ Choose fish and poultry more often. Remove the skin from chicken and turkey ▪ Select lean cuts of beef, veal, pork or wild game. ▪ Trim all visible fat from meat. ▪ Bake, roast, broil, grill, or boil instead of frying or adding fat.	**A serving can be:** ▪ 2 to 3 oz. cooked lean meat, poultry, or fish ▪ 1/2 to 3/4 cup tuna or cottage cheese ▪ 2 to 3 oz. cheese ▪ 1 egg* ▪ 2 Tbsp. peanut butter* ▪ 4 oz. tofu* ▪ equivalent to 1 oz. of meat
 **Fats, Sweets, and Alcohol** eaten in small amounts. Fats and oils should be limited because they are high in calories. Sweets are high in sugar and should only be eaten once in a while. **Fats** Eat less fat. ▪ Eat less saturated fat. It is found in meat and animal products such as hamburger, cheese, bacon, and butter. ▪ Saturated fat is usually solid at room temperature. **Sweets** ▪ When sweets are eaten, make them part of a healthy diet. ▪ Don't eat them as extras **Alcohol** ▪ limit the amount and have it with a meal	**A serving can be:** **Fats** ▪ 1/8 avocado ▪ 1 Tbsp. cream cheese or salad dressing ▪ 1 tsp. butter, margarine, oil, or mayonnaise ▪ 10 peanuts **Sweets** ▪ 1/2 cup ice cream ▪ 1 small cupcake or muffin ▪ 2 small cookies

For people taking certain diabetes medicines, following a schedule for meals, snacks, and physical activity is best. However, some diabetes medicines allow for more flexibility.



Adapted (8-07) from: National Diabetes Education Program (NDEP) http://ndep.nih.gov NIDDK, National Institutes of Health, Bethesda, MD

Foot Health and Diabetes

Gangrene
Severe infections may be present but undetected by patients with neuropathy who have difficulty examining their feet.

Ulceration of the great toe
This deceptively small lesion seriously increases the risk for amputation. Risk factors for amputation include: peripheral neuropathy, abnormal biomechanics, peripheral vascular disease, prior ulceration and prior amputation.

Hammer toes
The loss of foot musculature has led to abnormal foot biomechanics with the toes drawn up into a "hammer toe" position. The increases the risk of ulceration and amputation.

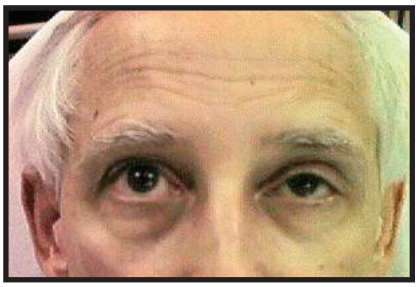
Peripheral neuropathy
Shiny skin, the inability to sweat and lack of protective sensation compound the risk for amputation in this patient with foot deformity and overriding toes. Treatment includes special footwear, patient education, and vigilant daily foot hygiene and inspection.

Ulceration
Even large wounds can be painless in the face of neuropathy and patients may deny there is a problem. The patient with this lesion needs referral for a program of wound management and non weight-bearing rehabilitation.

Eye Health and Diabetes

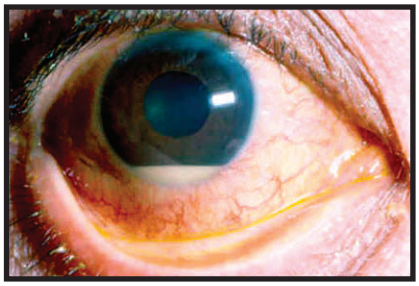
This is what a person with normal vision sees.

This is what a person with diabetic retinopathy sees.



This patient with ptosis (drooping lid) and double vision from an inability to turn the eye up, down, or inward has a Cranial Nerve III palsy. Cranial nerve palsy is not uncommon in diabetes; a person with this condition should be referred for an eye exam to rule out other serious conditions.

This patient with eye pain, light sensitivity, and a 2-mm white lesion has a corneal ulcer. People with diabetes may not complain of pain because of corneal neuropathy. Steroid or over-the-counter eye drops would be a serious mistake – this patent needs referral.



Hypopyon, white cells collecting in the anterior chamber of the eye, is a sign of serious intraocular infection and/or inflammation; this person should be referred immediately.

An irregular pupil can it be a sign of iritis or nerve palsy– a potential complication of diabetes or other conditions. Iritis can lead to pupillary block glaucoma, a sight threatening condition. This patient needs referral.

Oral Health and Diabetes

Periodontal (gum) disease

Periodontal (gum) disease

Periodontal abscess

Periodontal abscess

Thrush (oral Candidiasis)

Healthy gums and teeth

Fibromyalgia

Definition

Fibromyalgia is a chronic syndrome (constellation of signs and symptoms) characterized by diffuse or specific muscle, joint, or bone pain, fatigue, and a wide range of other symptoms.

Characteristics

The defining symptoms of Fibromyalgia are chronic, widespread pain and tenderness to light touch, and usually moderate to severe fatigue.

In addition to pain and fatigue, people who have Fibromyalgia may experience:

- sleep disturbances,
- morning stiffness,
- headaches,
- irritable bowel syndrome,
- painful menstrual periods,
- numbness or tingling of the extremities,
- restless legs syndrome,
- temperature sensitivity,
- cognitive and memory problems (sometimes referred to as "fibro fog"), or
- a variety of other symptoms.

Fibromyalgia is often referred to as an **"invisible" illness** or disability due to the fact that generally there are no outward indications of the illness or its resulting disabilities.

Functional Considerations

- Fibromyalgia can affect every aspect of a person's life due to pervasive and persistent chronic pain.
- Expect that the consumer may have cycles of good days and bad days.
- Individuals suffering from invisible illnesses in general often face disbelief or accusations of malingering or laziness from others that are unfamiliar with the syndrome and therefore may be defensive during the assessment.
- Fibromyalgia is a chronic condition, but is not progressive.

NIAMS
National Institute of Arthritis and Musculoskeletal and Skin Diseases
National Institutes of Health
Department of Health & Human Services

Fibromyalgia

Fibromyalgia syndrome is a common and chronic disorder characterized by widespread muscle pain, fatigue, and multiple tender points. Tender points are specific places on the body—on the neck, shoulders, back, hips, and upper and lower extremities—where people with fibromyalgia feel pain in response to slight pressure.

The word fibromyalgia comes from the Latin term for fibrous tissue (fibro) and the Greek ones for muscle (myo) and pain (algia).

Although fibromyalgia is often considered an arthritis-related condition, it is not truly a form of arthritis (a disease of the joints) because it does not cause inflammation or damage to the joints, muscles, or other tissues. Like arthritis, however, fibromyalgia can cause significant pain and fatigue, and it can interfere with a person's ability to carry on daily activities. Also like arthritis, fibromyalgia is considered a rheumatic condition.

The term rheumatic means a medical condition that impairs the joints and/or soft tissues and causes chronic pain.

In addition to pain and fatigue, people who have fibromyalgia may experience

- sleep disturbances,
- morning stiffness,
- headaches,
- irritable bowel syndrome,
- painful menstrual periods,
- numbness or tingling of the extremities,
- restless legs syndrome,
- temperature sensitivity,
- cognitive and memory problems (sometimes referred to as "fibro fog"), or
- a variety of other symptoms.

Fibromyalgia is a syndrome rather than a disease. Unlike a disease, which is a medical condition with a specific cause or causes and recognizable signs and symptoms, a syndrome is a collection of signs, symptoms, and medical problems that tend to occur together but are not related to a specific, identifiable cause.

Fibromyalgia is often referred to as an **"invisible" illness** or disability due to the fact that generally there are no outward indications of the illness or its resulting disabilities. The invisible nature of the illness, as well as its relative rarity and the lack of understanding about its pathology, often has psychosocial complications for those that have the syndrome. Individuals suffering from invisible illnesses in general often face disbelief or accusations of malingering or laziness from others that are unfamiliar with the syndrome.

Who Gets Fibromyalgia?

- Fibromyalgia affects 3 to 6 million - or as many as one in 50 - Americans.
- For unknown reasons, between 80 and 90 percent of those diagnosed with fibromyalgia are women; however, men and children also can be affected.
- Most people are diagnosed during middle age, although the symptoms often become present earlier in life.

What Causes Fibromyalgia?

The causes of fibromyalgia are unknown, but there are probably a number of factors involved:

- Many people associate the development of fibromyalgia with a physically or emotionally stressful or traumatic event, such as an automobile accident.
- Some connect it to repetitive injuries.

- Others link it to an illness.
- People with rheumatoid arthritis and other autoimmune diseases, such as lupus, are particularly likely to develop fibromyalgia. For others, fibromyalgia seems to occur spontaneously.

Many researchers are examining other causes, including problems with how the central nervous system (the brain and spinal cord) processes pain.

Some scientists speculate that a person's genes may regulate the way his or her body processes painful stimuli. According to this theory, people with fibromyalgia may have a gene or genes that cause them to react strongly to stimuli that most people would not perceive as painful. However, those genes—if they, in fact, exist—have not been identified.

How is Fibromyalgia Diagnosed?

- People with fibromyalgia typically see many doctors before receiving the diagnosis. One reason for this may be that pain and fatigue, the main symptoms of fibromyalgia, overlap with many other conditions.
- Doctors often have to rule out other potential causes of these symptoms before making a diagnosis of fibromyalgia.
- There are currently no diagnostic laboratory tests for fibromyalgia; standard laboratory tests fail to reveal a physiologic reason for pain.
- Because there is no generally accepted, objective test for fibromyalgia, some doctors unfortunately may conclude a patient's pain is not real, or they may tell the patient there is little they can do.

A doctor familiar with fibromyalgia, however, can make a diagnosis based on two established criteria:

- A history of widespread pain lasting more than 3 months and
  - Pain is considered to be widespread when it affects all four quadrants of the body; that is, the person must have pain in both their right and left sides as well as above and below the waist to be diagnosed with fibromyalgia.
- The presence of tender points.
  - There are 18 designated sites on the body as possible tender points. For a fibromyalgia diagnosis, a person must have 11 or more tender points. One of these predesignated sites is considered a true tender point only if the person feels pain upon the application of 8 pounds of pressure to the site. People who have fibromyalgia certainly may feel pain at other sites, too, but those 18 standard possible sites on the body are the criteria used for classification.

The location of the nine paired tender points that comprise the 1990 American College of Rheumatology criteria for fibromyalgia.

How is Fibromyalgia Treated?

Fibromyalgia can be difficult to treat. Not all doctors are familiar with fibromyalgia and its treatment, so it is important to find a doctor who is. Many family physicians, general internists, or rheumatologists (doctors who specialize in arthritis and other conditions that affect the joints or soft tissues) can treat fibromyalgia.

At present, there are no medications approved by the U.S. Food and Drug Administration (FDA) specifically for treating fibromyalgia, although a few such drugs are in development. Doctors treat fibromyalgia with a variety of medications developed and approved for other purposes.

Following are some of the most commonly used categories of drugs for fibromyalgia:

Analgesics	• Analgesics are painkillers. • Range: OTC acetaminophen (Tylenol*) to prescription medicines, such as tramadol (Ultram), and even stronger narcotic preparations. • For a subset of people with fibromyalgia, narcotic medications are prescribed for severe muscle pain. However, there is no solid evidence showing that narcotics actually work to treat the chronic pain of fibromyalgia, and most doctors hesitate to prescribe them for long-term use because of the potential that the person taking them will become physically or psychologically dependent on them.
Nonsteroidal Anti-Inflammatory Drugs (NSAIDs)	• Including aspirin, ibuprofen (Advil, Motrin), and naproxen sodium (Anaprox, Aleve). • Although inflammation is not a symptom of fibromyalgia, NSAIDs also relieve pain. • NSAIDs work by inhibiting substances in the body called prostaglandins, which play a role in pain and inflammation. These medications may help ease the muscle aches of fibromyalgia. They may also relieve menstrual cramps and the headaches often associated with fibromyalgia.
Antidepressants Doctors prescribe several types of antidepressants for people with fibromyalgia.	• Perhaps the most useful medications for fibromyalgia are several in the antidepressant class. • Antidepressants elevate the levels of certain chemicals in the brain, including serotonin and norepinephrine (which was formerly called adrenaline). • Low levels of these chemicals are associated not only with depression, but also with pain and fatigue. Increasing the levels of these chemicals can reduce pain in people who have fibromyalgia.
1. Tricyclic antidepressants amitriptyline hydrochloride (Elavil, Endep), cyclobenzaprine (Cycloflex, Flexeril, Flexiban), doxepin (Adapin, Sinequan), nortriptyline (Aventyl, Pamelor).	• When taken at bedtime in dosages lower than those used to treat depression, tricyclic antidepressants can help promote restorative sleep in people with fibromyalgia. • Can relax painful muscles and heighten the effects of the body's natural pain-killing substances called endorphins. • Tricyclic antidepressants have been around for almost half a century.
2. Selective serotonin reuptake inhibitors fluoxetine (Prozac), paroxetine (Paxil), and sertraline (Zoloft).	• If a tricyclic antidepressant fails to bring relief, doctors sometimes prescribe a newer type of antidepressant called a selective serotonin reuptake inhibitor (SSRI). • As with tricyclics, doctors usually prescribe these for people with fibromyalgia in lower dosages than are used to treat depression. • By promoting the release of serotonin, these drugs may reduce fatigue and some other symptoms associated with fibromyalgia. • SSRIs may be prescribed along with a tricyclic antidepressant. Doctors

	rarely prescribe SSRIs alone. Because they make people feel more energetic, they also interfere with sleep, which often is already a problem for people with fibromyalgia. • Studies have shown that a combination therapy of the tricyclic amitriptyline and the SSRI fluoxetine resulted in greater improvements in the study participants' fibromyalgia symptoms than either drug alone.
3. Mixed reuptake inhibitors venlafaxine (Effexor) and nefazadone (Serzone	• Some newer antidepressants raise levels of both serotonin and norepinephrine, and are therefore called mixed reuptake inhibitors. • Researchers are actively studying the efficacy of these newer medications in treating fibromyalgia.
4. Benzodiazepines clonazepam (Klonopin) and diazepam (Valium)	• Help some people with fibromyalgia by relaxing tense, painful muscles and stabilizing the erratic brain waves that can interfere with deep sleep. • Can relieve the symptoms of restless legs syndrome, which is common among people with fibromyalgia. Restless legs syndrome is characterized by unpleasant sensations in the legs as well as twitching, particularly at night. • Because of the potential for addiction, doctors usually prescribe benzodiazepines only for people who have not responded to other therapies.
Other medications	Prescribed to treat a person's specific symptoms or fibromyalgia-related conditions. • Irritable bowel syndrome: tegaserod (Zelnorm) and alosetron (Lotronex). • Gabapentin (Neurontin) currently is being studied as a treatment for fibromyalgia. • Other symptom-specific medications include sleep medications, muscle relaxants, and headache remedies.

People with fibromyalgia also may benefit from:

- A combination of **physical and occupational therapy**
- Learning **pain-management and coping techniques**
- Properly **balancing rest and activity**

Complementary and Alternative Therapies

Many people with fibromyalgia also report varying degrees of success with complementary and alternative therapies, including:

- Massage,
- Movement therapies (such as Pilates and the Feldenkrais method),
- Chiropractic treatments,
- Acupuncture, and
- Various herbs and dietary supplements for different fibromyalgia symptoms.

Though supplements are being studied for fibromyalgia, there is little, if any, scientific proof yet that they help. The FDA does not regulate the sale of dietary supplements, so information about side effects, the proper dosage, and the amount of a preparation's active ingredient may not be well known. Before trying a complementary or alternative therapy, the person should first speak with their doctor, who may know more about the therapy's effectiveness, as well as whether it is safe to try in combination with present medications.

Will Fibromyalgia Get Better with Time?

Fibromyalgia is a **chronic condition**, meaning it lasts a long time - possibly a lifetime. However, fibromyalgia is not a progressive disease. It is never fatal, and it won't cause damage to joints, muscles, or internal organs. In many people, the condition does improve over time.

Ways to Get Symptomatic Relief

Besides taking medicine prescribed by the doctor, there are many things that can be done to minimize the impact of fibromyalgia. These include:

- **Getting enough sleep**—Getting enough sleep and the right kind of sleep can help ease the pain and fatigue of fibromyalgia. Even so, many people with fibromyalgia have problems such as pain, restless legs syndrome, or brain-wave irregularities that interfere with restful sleep.
- **Exercising**—Though pain and fatigue may make exercise and daily activities difficult, it's crucial to be as physically active as possible. Research has repeatedly shown that regular exercise is one of the most effective treatments for fibromyalgia. People who have too much pain or fatigue to do vigorous exercise should begin with walking or other gentle exercise and build their endurance and intensity slowly. Although research has focused largely on the benefits of aerobic and flexibility exercises, a new NIAMS-supported study is examining the effects of adding strength training to the traditionally prescribed aerobic and flexibility exercises.
- **Making changes at work**—Most people with fibromyalgia continue to work, but they may have to make big changes to do so; for example, some people cut down the number of hours they work, switch to a less demanding job, or adapt a current job.
- **Eating well**—Although some people with fibromyalgia report feeling better when they eat or avoid certain foods, no specific diet has been proven to influence fibromyalgia. Of course, it is important to have a healthy, balanced diet. Not only will proper nutrition provide for more energy and generally improve how the person feels, it will also help avoid other health problems.

Tips for Good Sleep

- **Keep regular sleep habits**. Try to get to bed at the same time and get up at the same time every day—even on weekends and vacations.
- **Avoid caffeine and alcohol in the late afternoon and evening**. If consumed too close to bedtime, the caffeine in coffee, soft drinks, chocolate, and some medications prevent a person from sleeping or sleeping soundly. Drinking alcohol around bedtime also can disturb sleep.
- **Time exercise**. Regular daytime exercise can improve nighttime sleep. But avoid exercising within 3 hours of bedtime, which actually can be stimulating, and cause sleeplessness.
- **Avoid daytime naps.** Sleeping in the afternoon can interfere with nighttime sleep. If a person feels like they can't get by without a nap, set an alarm for 1 hour. When it goes off, get up and start moving.
- **Reserve the bed for sleeping**. Watching the late news, reading a suspense novel, or working on a laptop in bed can be stimulating, making it hard to sleep.
- **Keep the bedroom dark, quiet, and cool**.
- **Avoid liquids and spicy meals before bed**. Heartburn and late night trips to the bathroom are not conducive to good sleep.
- **Wind down before bed**. Avoid working right up to bedtime. Do relaxing activities, such as listening to soft music or taking a warm bath, to get ready to sleep. (An added benefit of the warm bath: It may soothe aching muscles.)

What are Researchers Learning about Fibromyalgia?

The National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS) sponsors research that will improve scientists' understanding of the specific problems that cause or accompany fibromyalgia, in turn helping them develop better ways to diagnose, treat, and prevent this syndrome.

The research on fibromyalgia supported by NIAMS covers a broad spectrum, ranging from basic laboratory research to studies of medications and interventions designed to encourage behaviors that reduce pain and change behaviors that worsen or perpetuate pain.

Following are descriptions of some of the promising research now being conducted:

- **Understanding pain**—Because research suggests that fibromyalgia is caused by a problem in how the body processes pain—or more precisely, a hypersensitivity to stimuli that normally are not painful—several NIAMS-supported researchers are focusing on ways the body processes pain to better understand why people with fibromyalgia have increased pain sensitivity.
    - Previous research has shown that people with fibromyalgia have reduced blood flow to parts of the brain that normally help the body deal with pain. In one new NIAMS-funded study, researchers will be using imaging technology called positron emission tomography (PET) to compare blood flow in the brains of women who have fibromyalgia with those who do not. In both groups, researchers will study changes in blood flow that occur in response to painful stimuli.
    - Researchers speculate that female reproductive hormones may be involved in the increased sensitivity to pain characteristic of fibromyalgia. New research will examine the role of sex hormones in pain sensitivity, in reaction to stress, and in symptom perception at various points in the menstrual cycles of women with fibromyalgia and of women without it. The results from studying these groups of women will be compared with results from studies of the same factors in men without fibromyalgia over an equivalent period of time.
    - Another line of NIAMS-funded research involves developing a rodent model of fibromyalgia pain. Rodent models, which use mice or rats that researchers cause to develop symptoms similar to fibromyalgia in humans, could provide the basis for future research into this complex condition.

- **Understanding stress**—Medical evidence suggests that a problem or problems in the way the body responds to physical and/or emotional stress may trigger or worsen the symptoms of any illness, including fibromyalgia.
    - Researchers funded by NIAMS are trying to uncover and understand these problems by examining chemical interactions between the nervous system and the endocrine (hormonal) system. Scientists know that people whose bodies make inadequate amounts of the hormone cortisol experience many of the same symptoms as people with fibromyalgia, so they also are exploring if there is a link between the regulation of the adrenal glands, which produce cortisol, and fibromyalgia.
    - Another NIAMS-funded study suggests that exercise improves the body's response to stress by enhancing the function of the pituitary and adrenal glands. The hormones produced by these two endocrine glands are essential to regulating sleep and emotions, as well as processing pain.

- **Improving sleep**—Researchers supported by NIAMS are investigating ways to improve sleep for people with fibromyalgia whose sleep problems persist despite treatment with medications.
    - One team has observed that fibromyalgia patients with persistent sleep problems share characteristics with people who have insomnia, such as having erratic sleep and wake schedules and spending too much time in bed. This team is testing whether strategies developed to help insomnia patients will also help people with fibromyalgia achieve deep sleep, which eases pain and fatigue. Preliminary results show that sleep education, which teaches good sleep habits, and cognitive behavioral therapy, which includes sleep education and a regimen to correct poor habits and improper sleep schedules, both reduce insomnia.

- **Looking for the family connection**—Because fibromyalgia appears to run in families,
    - One group of NIAMS-supported researchers is working to identify whether a gene or genes predispose people to the condition.
    - Another team is trying to determine if fibromyalgia is more common in people with other conditions, such as serious mood disorders, that tend to run in families. Specifically, the group is studying the prevalence of psychiatric disorders and arthritis and related disorders in people with fibromyalgia and their first-degree relatives (parents, children, sisters, brothers) as compared to people with rheumatoid arthritis and their relatives. The group is exploring whether clusters of conditions exist in families, which might shed light on shared common risk factors or disease processes.

- **Studying and targeting treatments**—NIAMS recently funded its first study of a drug treatment for fibromyalgia. The study will measure the effectiveness of gabapentin, an anticonvulsant medication, in reducing symptoms of fibromyalgia. Gabapentin has been found to relieve chronic pain caused by nervous system disorders, and it was recently approved by the FDA for the treatment of persistent, severe pain that can follow an episode of shingles.

Key Words

Adrenal glands—A pair of endocrine glands located on the surface of the kidneys. The adrenal glands produce corticosteroid hormones such as cortisol, aldosterone, and the reproductive hormones.
Arthritis—Literally means joint inflammation, but is often used to indicate a group of more than 100 rheumatic diseases. These diseases affect not only the joints but also other connective tissues of the body, including important supporting structures, such as muscles, tendons, and ligaments, as well as the protective covering of internal organs.
Analgesic—A medication or treatment that relieves pain.
Connective tissue—The supporting framework of the body and its internal organs.
Chronic disease—An illness that lasts for a long time, often a lifetime.
Cortisol—A hormone produced by the adrenal cortex, important for normal carbohydrate metabolism and for a healthy response to stress.
Fibrous capsule—A tough wrapping of tendons and ligaments that surrounds the joint.
Fibromyalgia—A chronic syndrome that causes pain and stiffness throughout the connective tissues that support and move the bones and joints. Pain and localized tender points occur in the muscles, particularly those that support the neck, spine, shoulders, and hip. The disorder includes widespread pain, fatigue, and sleep disturbances.
Inflammation—A characteristic reaction of tissues to injury or disease. It is marked by four signs: swelling, redness, heat, and pain. Inflammation is not a symptom of fibromyalgia.
Joint—A junction where two bones meet. Most joints are composed of cartilage, joint space, fibrous capsule, synovium, and ligaments.
Ligaments—Bands of cordlike tissue that connect bone to bone.
Muscle—A structure composed of bundles of specialized cells that, when stimulated by nerve impulses, contract and produce movement.
Nonsteroidal anti-inflammatory drugs (NSAIDs) —A group of drugs, such as aspirin and aspirin-like drugs, used to reduce inflammation that causes joint pain, stiffness, and swelling.
Pituitary gland—A pea-sized gland attached beneath the hypothalamus at the base of the skull that secretes many hormones essential to bodily functioning. The secretion of pituitary hormones is regulated by chemicals produced in the hypothalamus.
Sleep disorder—A disorder in which a person has difficulty achieving restful, restorative sleep. In addition to other symptoms, people with fibromyalgia usually have a sleep disorder.
Tender points—Specific places on the body where a person with fibromyalgia feels pain in response to slight pressure.
Tendons—Fibrous cords that connect muscle to bone.

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National Heart Lung and Blood Institute

What is Blood Pressure?

Blood pressure is the force of the blood pushing against the walls of the arteries. It is lowest as a person sleeps and rises when awakened. It also can rise when excited, nervous, or active.

Blood pressure is given as two equally important numbers:

- **Systolic** pressure is the force of the blood pushing on the walls of the arteries when the heart beats.
- **Diastolic** pressure is when the heart is at rest between beats and blood pressure falls.

The two pressures are written one above or before the other, such as 120/80 mmHg. The systolic pressure is the first or top number, and the diastolic pressure is the second or bottom number. If a blood pressure reading is 120/80, it is expressed orally as "120 over 80."

What is Normal Blood Pressure?

- **Normal blood pressure is lower than 120/80 mmHg**. In general, lower is better; however, very low blood pressure should be checked out by a doctor.
- **Prehypertension is blood pressure between 120 and 139 for the top number, or between 80 and 89 for the bottom number.** Blood pressure readings of 138/82, 128/89, or 130/86 are all in the prehypertension range. Blood pressures in this range are likely become high blood pressures unless actions are taken to prevent it.

What is High Blood Pressure?

About 65 million American adults—nearly 1 in 3—have high blood pressure. Once high blood pressure develops, it usually lasts a lifetime. The good news is that it can be treated and controlled. High blood pressure is called the **silent killer** because it frequently has no symptoms. Some people may not find out they have it until they have other problems.

When high blood pressure is not found and treated, it can cause:

- The heart to get larger, which may lead to heart failure.
- Small bulges (aneurysms) to form in blood vessels. Common locations are the main artery from the heart (aorta); arteries in the brain, legs, and intestines; and the artery leading to the spleen.
- Blood vessels in the kidney to narrow, which may cause kidney failure.
- Arteries throughout the body, especially in the heart, brain, kidneys, and legs, to "harden" faster. This can cause a heart attack, stroke, kidney failure, or amputation of part of the leg.
- Blood vessels in the eyes to burst or bleed, which may cause vision changes and can result in blindness.

A blood pressure of 140/90 mmHg or higher is considered high blood pressure. If one or both numbers are usually high, you have high blood pressure.

There are two levels of high blood pressure: stage 1 and stage 2 (see the chart below).

Categories for Blood Pressure Levels in Adults (in mmHg, millimeters of mercury)[a]

Category	Systolic (top number)	Diastolic (bottom number)
Normal	Less than 120	Less than 80
Prehypertension	120–139	80–89
High blood pressure		
Stage 1	140–159	90–99
Stage 2	160 or higher	100 or higher

[a]	For adults 18 and older who are not on medicine for high blood pressure; are not having a short-term serious illness; and do not have other conditions, such as diabetes and kidney disease.
Note: When systolic and diastolic blood pressures fall into different categories, the higher category should be used to classify blood pressure level. For example, 160/80 mmHg would be stage 2 high blood pressure.	

There is an exception to the above definition of high blood pressure. A blood pressure of 130/80 mmHg or higher is considered high blood pressure in people with diabetes and chronic kidney disease.

Other Names for High Blood Pressure

- HBP
- Hypertension
- HTN

What Causes High Blood Pressure?

Essential or primary high blood pressure – a single specific cause is not known. Research is ongoing to find the causes of essential high blood pressure.

Secondary high blood pressure – when high blood pressure is the result of another medical problem or medicine. The cause is known.

Who is At Risk for High Blood Pressure?

In the United States, high blood pressure occurs more often in African Americans than in Caucasians. Compared to other groups, African Americans:

- Tend to get high blood pressure earlier in life
- Usually have more severe high blood pressure
- Have a higher death rate from stroke, heart disease, and kidney failure

Many people get high blood pressure as they get older. Over half of all Americans aged 60 and older have high blood pressure. There things that can be done to keep blood pressure normal, such as eating a healthy diet, maintaining a healthy weight, and getting enough physical activity.

The chances of developing high blood pressure are also higher if a person:

- Is overweight
- Is a man over the age of 45
- Is a woman over the age of 55
- Has a family history of high blood pressure
- Has prehypertension (blood pressure in the 120–139/80–89 mmHg range)

Other things that can raise blood pressure include:

- Eating too much salt
- Drinking too much alcohol
- Not consuming enough potassium
- Not doing enough physical activity
- Taking certain medicines
- Having long-lasting stress
- Smoking (smoking can cause a temporary rise in blood pressure)

How Do You Know Whether You Have High Blood Pressure?

Most doctors will check a person's blood pressure several times on different days before deciding that blood pressure is high. A diagnosis of high blood pressure is given if repeated readings are 140/90 mmHg or higher, or 130/80 mmHg or higher if the patient has diabetes or chronic kidney disease.

Testing blood pressure is quick and easy. A doctor or nurse will use a gauge, a stethoscope (or electronic sensor), and a blood pressure cuff, also called a sphygmomanometer (sfig-mo-ma-NOM-e-ter).

Blood pressure readings are usually taken while sitting or lying down and relaxed.

Below are actions patients can take to insure an accurate reading:

- Not drinking coffee or smoking cigarettes 30 minutes before having blood pressure taken.
- Wearing short sleeves.
- Going to the bathroom before the reading. Having a full bladder can change a blood pressure reading.
- Sitting for 5 minutes before the test.

Blood pressure can also be tested at home with a home blood pressure measurement device, or monitor, available at discount chain stores and pharmacies. A doctor, nurse, or pharmacist can teach how to use the device correctly and can also help in choosing the correct blood pressure monitor.

Below are actions patients can take to insure an accurate reading at home:

- Sit with the back supported and feet flat on the floor.
- Rest the arm on a table at the level of the heart.
- Take two readings, at least 2 minutes apart, and average the results.

Some people's blood pressure is high only when they visit the doctor's office, a condition is called **white coat hypertension**. If your doctor suspects this, you may be asked to check and record your blood pressure at home with a home monitor. Another way to check blood pressure away from the doctor's office is by using an ambulatory blood pressure monitor. This device is worn for 24 hours and can take blood pressure every 30 minutes.

How is High Blood Pressure Treated?

Usually, the goal is to keep your blood pressure below 140/90 mmHg (130/80 mmHg if you have diabetes or chronic kidney disease). The patient should ask their doctor what their blood pressure goal should be.

Some people can prevent or control high blood pressure by changing to healthier habits, such as:

- Following the DASH (Dietary Approaches to Stop Hypertension) Eating Plan, which includes cutting down on salt and sodium and eating healthy foods such as fruits, vegetables, and low-fat dairy products
- Losing excess weight and staying at a healthy weight
- Being physically active (for example, walking 30 minutes every day)
- Quitting smoking
- Limiting alcohol intake

Sometimes blood pressure stays too high even when a person makes these kinds of healthy changes. In that case, it is necessary to add medicine to help lower blood pressure. Medicines can control blood pressure, but they cannot cure it.

Blood pressure medicines work in different ways to lower blood pressure. Below are the types of medicine used to treat high blood pressure:

Diuretics *(spironolactone, furosemide)*	• Help kidneys flush excess water and salt from the body, reducing the amount of fluid in the blood, and reducing blood pressure.
Beta blockers *(oxprenolol, pindolol, acebutolol,antenolol)*	• Help the heart beat slower and with less force, pumping less blood through the blood vessels.
Angiotensin converting enzyme (ACE) inhibitors *[Captopril (Capoten®),Enalapril (Vasotec®/Renitec®)]*	• Prevent the body from making the hormone angiotensin II, which normally causes blood vessels to narrow.
Angiotensin II receptor blockers (ARBs) *(Losartan, Valsartan)*	• Protect the blood vessels from angiotensin II; blood vessels relax and become wider.
Calcium channel blockers (CCBs) *[Nifedipine(Procardia, Adalat)]*	• Prevent calcium from entering the muscle cells of the heart and blood vessels, causing the vessels to relax.
Alpha blockers *[Doxazosin(Cardura), Prazosin(Minipress)]*	• Reduce nerve impulses that tighten blood vessels.
Alpha-beta blockers *(Bucindolol)*	• Reduce nerve impulse to blood vessels and slow the heartbeat.
Nervous system inhibitors	• Relax blood vessels by controlling nerve impulses from the brain; blood vessels become wider.
Vasodilators *(Nitroglycerin)*	• Open blood vessels by directly relaxing the muscle in the vessel walls

It is important that you take blood pressure medicine at the same time each day and not to skip days or cut pills in half to save money. If a patient is being treated for high blood pressure and has repeated readings in the normal range, he/she still has high blood pressure and should continue to take the medication.

How can High Blood Pressure be Prevented?

Steps can be taken to prevent high blood pressure:

- Keeping a healthy weight
- Being physically active
- Following a healthy eating plan that emphasizes fruits, vegetables, and low-fat dairy foods
- Choosing and preparing foods with less salt and sodium
- Quitting smoking
- Drinking alcohol in moderation if the patient decides to drink.

Living with High Blood Pressure

It is important that a patient with blood pressure:

- Keeps track of his/her blood pressure. Learns to take own blood pressure at home or have it regularly checked by a health care professional. Writes it down each time (with date).
- Talks to his/her health care provider about the names and dosages of blood pressure medications and how to take them.
- Talks to his/her doctor if problems (side effects) arise from taking blood pressure medication.
- Refills blood pressure medicines before they run out.
- Takes blood pressure medicines exactly as directed—doesn't skip days or cut pills in half.
- Keeps follow-up appointments with his/her health care provider.
- Chooses healthier habits—eats a heart healthy diet, gets regular physical activity, and doesn't smoke.
- Asks his/her your doctor or health care provider questions about treatment and what needs to be done to lower high blood pressure.

* Remember, high blood pressure has no symptoms. A patient will not be able to tell if he/she has high blood pressure by the way he/she feels.

Women and High Blood Pressure

In some women, blood pressure can increase if they use birth control pills, become pregnant, or take hormone therapy (HT) during menopause.

Oral Contraceptives (Birth Control Pills)

Women taking birth control pills usually have a small increase in both systolic and diastolic blood pressure. If a patient has high blood pressure and is using birth control pills, she should get her blood pressure checked regularly and talk to her doctor about a possible rise in blood pressure and what she can do about it.

If a patient has high blood pressure, is age 35 or older, and also smokes, she should not take birth control pills unless she quits smoking. Women age 35 and older who smoke and use birth control pills are more likely to develop heart disease or have a stroke. High blood pressure also raises the chances of stroke and heart disease.

If a patient is age 35 or older, healthy, does not smoke, and her high blood pressure is controlled, it may be safe for her to use birth control pills. Every woman should ask her doctor if birth control pills are safe for her.

Postmenopausal Hormone Therapy

Large randomized trials indicate that postmenopausal hormone therapy causes a small increase in systolic blood pressure. If a patient starts taking postmenopausal hormone therapy, she should have her blood pressure checked regularly and ask her doctor to answer any questions.

Older Adults and High Blood Pressure

A common form of high blood pressure in older adults is **isolated systolic hypertension (ISH)**. ISH is high blood pressure, but only the top (systolic) number is high (140 or higher). ISH can be as harmful as high blood pressure in which both numbers are high.

ISH is the most common form of high blood pressure for older adults. About 2 out of 3 people over age 60 with high blood pressure have ISH.

A patient may have ISH and feel fine. As with other types of high blood pressure, ISH often causes no symptoms. A patient should have his/her blood pressure checked to find out if he/ she has ISH.

If not treated, ISH can cause damage arteries and body organs. ISH is treated the same way as high blood pressure in which both systolic and diastolic pressures are high—by making changes in health habits and with blood pressure medicines.

Adapted from: High Blood Pressure, April 2006, http://www.nhlbi.nih.gov/health/dci/Diseases/Hbp/HBP_WhatIs.html

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Knee Implants

More joint replacement surgeries (arthroplasties) are performed on the knee than on any other joint. In a total knee arthroplasty (TKA), the diseased cartilage surfaces of the thighbone (femur), the shinbone (tibia) and the kneecap (patella) are replaced by prostheses made of metal alloys, high-grade plastics and polymeric materials. Most of the other structures of the knee, such as the connecting ligaments, remain intact.

Knee replacement surgery is generally recommended for patients with severe knee pain and disability caused by damage to cartilage from rheumatoid arthritis, osteoarthritis or trauma. It is highly successful in relieving pain and restoring joint function.

Implant Design

For simplicity, the knee is considered a hinge joint because of its ability to bend and straighten like a hinged door. In reality, the knee is much more complex because the surfaces actually roll and glide as the knee bends. The first implant designs used the hinge concept and literally included a connecting hinge between the components. Newer implant designs, recognizing the complexity of the joint, attempt to replicate the more complicated motions and to take advantage of the posterior cruciate ligament (PCL) and collateral ligaments for support.

Up to three bone surfaces may be replaced during a TKA: the lower ends (condyles) of the thighbone, the top surface of the shinbone and the back surface of the kneecap. Components are designed so that metal always articulates against plastic, which provides smooth movement and results in minimal wear.

1. Femoral component: The metal femoral component curves around the end of the thighbone and has an interior groove so the kneecap can move up and down smoothly against the bone as the knee bends and straightens. Usually, one large piece is used to resurface the end of the bone. If only one side of the thighbone is damaged, a smaller piece may be used (unicompartmental knee replacement) to resurface just that part of the bone. Some designs (posterior stabilized designs) have an internal post with a circular-shaped device (cam) that works with a corresponding tibial component to help prevent the thighbone from sliding forward too far on the shinbone when you bend the knee.
2. Tibial component: The tibial component is a flat metal platform with a polyethylene cushion. The cushion may be part of the platform (fixed) or separate (mobile) with either a flat surface (PCL-retaining) or a raised, sloping surface (PCL-substituting).
3. Patellar component: The patellar component is a dome-shaped piece of polyethylene that duplicates the shape of the kneecap anchored to a flat metal plate.

There are more than 150 knee replacement designs on the market today. Several manufacturers make knee implants. The brand and design used by your doctor or hospital depends on many factors, including your needs (based on your age, weight, activity level and health), the doctor's experience and familiarity with the device, and the cost and performance record of the implant. You may wish to discuss these issues with your doctor.

Implant Construction

The metal parts of the implant are made of titanium- or cobalt/chromium-based alloys. The plastic parts are made of ultrahigh-density polyethylene. All together, the components weigh between 15 and 20 ounces, depending on the size selected. The construction materials used must meet several criteria:

- They must be biocompatible; that is, they can function in the body without creating either a local or a systemic rejection response.
- Their mechanical properties must be able to duplicate the structures they are intended to replace; for example, they are strong enough to take weightbearing loads, flexible enough to bear stress without breaking and able to move smoothly against each other as required.
- They must be able to retain their strength and shape for a long time. The chance of a knee replacement lasting 15 to 20 years is about 95 percent.

To date, man-made joints have not solved the problem of wear. Every time bone rubs against bone, or metal rubs against plastic, the friction creates microscopic particulate debris. Just as wear in the natural joint contributed to the need for a replacement joint, wear in the prostheses may eventually require a second (revision) surgery.

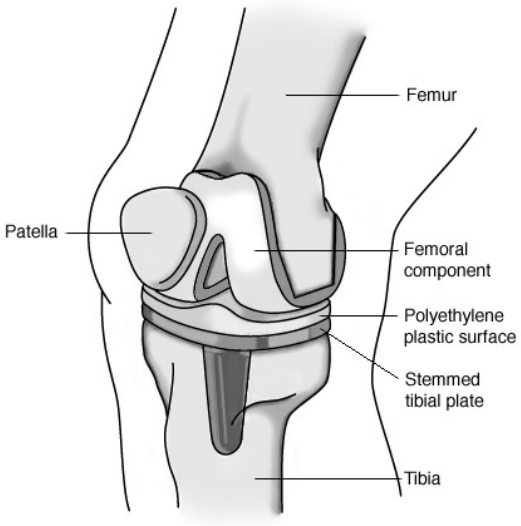
Implant Insertion

During a TKA, the knee is in a bent position so that all the surfaces to be replaced can be exposed. The usual approach is lengthwise through the front of the knee, just to the inside of the kneecap, although some surgeons will approach the joint from the outer side, just above the kneecap. The incision is 6" to 12" long. The large quadriceps muscle and the kneecap are moved to the side to reveal the bone surfaces.

After taking several measurements to ensure that the new implant will fit properly, the surgeon begins to smooth the rough edges of the bones. Depending on the type of implant used, the surgeon may begin with either the thighbone or the shinbone.

Special jigs are used to accurately trim the damaged surfaces at the end of the thighbone. The devices shape the end of the thighbone so it configures to the inside of the prosthesis. The shinbone is cut flat across the bone and a portion of the bone's center is drilled out. The surgeon removes just enough of the bone so that when the prosthesis is inserted, it recreates the joint line at the same level as prior to surgery. If any ligaments around the knee have contracted due to pain and deformity before the surgery, the surgeon carefully releases them so that they function as close to the normal state as possible.

The prostheses are inserted, tested and balanced. The surgeon wants to be sure that the joint line is in the right place and the kneecap is accurately aligned for proper joint movement. If it is necessary to resurface the kneecap, the surgeon will apply a shaped piece of polyethylene that maintains the original width of the kneecap.



The knee replacement may be "cemented," "cementless" or "hybrid," depending on the type of fixation used to hold the implant in place. Although there are certain general guidelines, each case is individual and your surgeon will evaluate your situation carefully before making any decisions. Do not hesitate to ask what type of fixation will be used in your situation and why that choice is appropriate for you.

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Activities after a Knee Replacement

If you are a candidate for knee replacement surgery, you probably anticipate that life after the surgery will be much like life before it, only without the pain. In many ways, you are correct. But change doesn't happen overnight and your active participation in the healing process is necessary to ensure a successful outcome.

Although you will be able to resume most activities, you should avoid activities that place excessive stress on the new knee. The following suggestions will help you adapt to your new joint and resume your daily activities safely.

Activities in the Hospital

The knee is the largest joint in the body, and replacing it is major surgery. Although you'll probably want to take it easy at first, early mobilization is important. If you had considerable pain in your knee, you probably cut back on your activities before surgery and your leg muscles may be weak. You'll need to build up strength in your quadriceps muscles to develop control of your new joint. Early activity is also important to counteract the effects of the anesthesia and to encourage healing. Your doctor and a physical therapist will give you specific instructions on wound care, pain control, diet and exercise.

Proper pain management is important in your early recovery. Although pain after surgery is quite variable and not entirely predictable, it can be controlled with medication. Initially, you will probably receive pain control medication through an intravenous (IV) connection so that you can regulate the amount of medication you need. Remember that it is easier to prevent pain than to control it. You don't have to worry about becoming dependent on the medication; after a day or two, injections or pills will replace the IV. You will also have to take antibiotics and blood-thinning medication to help prevent blood clots from forming in the veins of your thighs and calves.

You may lose your appetite and feel nauseous or constipated for a couple of days. These are normal reactions. You may be fitted with a urinary catheter during surgery and be given stool softeners or laxatives to ease the constipation caused by the pain medication after surgery. You will be taught to do breathing exercises to prevent congestion from developing in your chest and lungs.

Initially, you will have a bulky dressing around the knee and a drain to remove any fluid build up around the knee. The drain will be removed in a day or two. You may also be wearing elastic hose and, possibly, compression stocking sleeves. These plastic sleeves are connected to a machine that circulates air around your legs to help keep blood flowing normally.

Usually a physical therapist will visit you on the day after your surgery and begin teaching you how to use your new knee. You may be fitted with a continuous passive motion (CPM) machine that will slowly and smoothly straighten and bend your knee. Even as you lie in bed, you can "pedal" your feet and "pump" your ankles on a regular basis to promote blood flow in your legs.

Discharge

Your hospital stay may last from 3 to 7 days, depending on how well you heal after surgery. Before you go home, you will need to meet several goals:

1. Get in and out of bed by yourself
2. Bend your knee approximately 90 degrees, or show good progress in bending your knee
3. Extend (straighten) your knee fully
4. Walk with crutches or a walker on a level surface and to climb up and down 2 or 3 stairs
5. Do the prescribed home exercises

You may experience mild swelling in your leg after you are discharged. Elevating the leg, wearing compression hose and applying an ice pack for 15 to 20 minutes at a time will help reduce the swelling. You may be permitted to take the CPM machine home with you for a few weeks, but this is not a substitute for the prescribed exercises.

You will probably need some help at home for several weeks. If you do not have sufficient help at home, you may be temporarily transferred to a rehabilitation center. The following tips can make your homecoming more comfortable.

- Rearrange furniture so you can maneuver with a walker or crutches. You may temporarily change rooms (make the living room your bedroom, for example) to avoid using the stairs.
- Remove any throw or area rugs that could cause you to slip. Securely fasten electrical cords around the perimeter of the room.
- Install a shower chair, gripping bar and raised toilet in the bathroom.
- Use assistive devices such as a long-handled shoehorn, a long-handled sponge and a grabbing tool or reacher to avoid bending too far over.

Activities at Home

General guidelines for wound care include:

- Keep the area clean and dry. A dressing will be applied in the hospital and should be changed as necessary. Ask for instructions on how to change the dressing before you leave the hospital.
- Do not shower or bathe until the sutures or staples are removed, usually a week to 10 days after surgery. Keep the wound clean and dry.
- Notify your doctor if the wound appears red or begins to drain.
- Take your temperature twice daily and notify your doctor if it exceeds 100.5°F.
- Swelling is normal for the first three to six months after surgery. Elevate your leg slightly and apply ice.
- Calf pain, chest pain or shortness of breath are signs of a possible blood clot. Notify your doctor immediately if you notice any of these symptoms.

Medication. Take all medications as directed. You will probably be given a blood thinner to prevent clots from forming in the veins of your calf and thigh, because these clots can be life-threatening. If a blood clot forms and then breaks free, it could travel to your lungs, resulting in a pulmonary embolism, a potentially fatal condition.

Because you have an artificial joint, it is especially important to prevent any bacterial infections from settling in your joint implant. You should get a medical alert card and take antibiotics whenever there is the possibility of a bacterial infection, such as when you have dental work. Be sure to notify your dentist that you have a joint implant and let your doctor know if your dentist schedules an extraction, periodontal work, dental implant, or root canal work.

Diet. By the time you go home from the hospital, you should be eating a normal diet. Your physician may recommend that you take iron and vitamin C supplements. Continue to drink plenty of fluids and avoid excessive intake of vitamin K while you are taking the blood thinner medication. Foods rich in vitamin K include broccoli, cauliflower, Brussels sprouts, liver, green beans, garbanzo beans, lentils, soybeans, soybean oil, spinach, kale, lettuce, turnip greens, cabbage and onions. Try to limit your coffee intake and avoid alcohol. You should continue to watch your weight to avoid putting more stress on the joint.

Resuming normal activities. Once you get home, you should continue to stay active. The key is to remember not to overdo it! While you can expect some good days and some bad days, you should notice a gradual improvement and a gradual increase in your endurance over the next 6 to 12 months. The following guidelines are generally applicable, but the final answer on each of these issues should come from your doctor.

- Physical therapy exercises: Continue to do the exercises prescribed for at least two months after surgery. Riding a stationary bicycle can help maintain muscle tone and keep your knee flexible. Try to achieve the maximum degree of bending and extension possible.
- Driving: If your left knee was replaced and you have an automatic transmission, you may be able to begin driving in a week or so, provided you are no longer taking narcotic pain medication. If your right knee was replaced, avoid driving for 6 to 8 weeks. Remember that your reflexes may not be as sharp as before your surgery.
- Airport metal detectors: The sensitivity of metal detectors varies and it is unlikely that your prosthesis will cause an alarm. You should carry a medic alert card indicating you have an artificial joint, just in case.
- Sexual relations can be safely resumed approximately 4 to 6 weeks after surgery.
- Sleeping positions: You can safely sleep on your back, on either side, or on your stomach.
- Return to work: Depending on the type of activities you perform, it may be 6 to 8 weeks before you return to work.
- Other activities: Walk as much as you like, but remember that walking is no substitute for the exercises your doctor and physical therapist will prescribe. Swimming is also recommended; you can begin as soon as the sutures have been removed and the wound is healed, approximately 6 to 8 weeks after surgery. Acceptable activities include dancing, golfing (with spikeless shoes and a cart), and bicycling (on level surfaces). Avoid activities that put stress on the knee. These activities include: tennis, badminton, contact sports (football, baseball), squash or racquetball, jumping, squats, skiing or jogging. Do not do any heavy lifting (more than 40 pounds) or weight lifting.

Sample Exercises. These exercises will help strengthen the quadriceps muscles on the front of the thigh that stabilize and move the knee.

- Lie on your back with your arms at your side and your legs straight, together, and flat. Place a rolled towel or small pillow under your ankles to raise your heel slightly. Tighten the muscles on the top of one thigh as you push the back of your knee down toward the floor (bed). Hold for 5 seconds, relax for 5 seconds. Do 10 cycles with each leg.

- Put a rolled blanket or pillow under your knee so that the knee bends about 30 to 40 degrees. Tighten the muscles on the top of your thigh and straighten the knee by lifting your heel off the floor (bed). Hold 5 seconds, then slowly lower your heel to the floor (bed). Repeat 10 to 20 times.

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Knee Replacement Exercise Guide

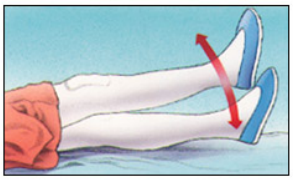
Regular exercise to restore your knee mobility and strength and a gradual return to everyday activities are important for your full recovery. Your orthopaedic surgeon and physical therapist may recommend that you exercise approximately 20 to 30 minutes two or three times a day and walk 30 minutes, two or three times a day during your early recovery. Your orthopaedist may suggest some of the following exercises. The following guide can help you better understand your exercise/activity program, supervised by your therapist and orthopaedic surgeon.

Early Post-operative Exercises

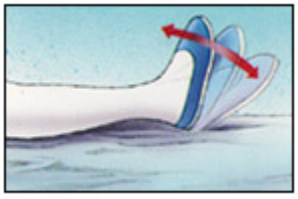
Start the following exercises as soon as you are able. You can begin these in the recovery room shortly after surgery. You may feel uncomfortable at first, but these exercises will speed your recovery and actually diminish your post-operative pain.

Quad Sets - Tighten your thigh muscle. Try to straighten your knee. Hold for 5 to 10 seconds. Repeat this exercise approximately 10 times during a two minute period, rest one minute and repeat. Continue until your thigh feels fatigued.

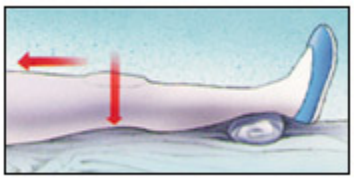
Straight Leg Raises - Tighten the thigh muscle with your knee fully straightened on the bed, as with the Quad set. Lift your leg several inches. Hold for five to 10 seconds. Slowly lower. Repeat until your thigh feels fatigued.
You also can do leg raises while sitting. Fully tighten your thigh muscle and hold your knee fully straightened with your leg unsupported. Repeat as above. Continue these exercises periodically until full strength returns to your thigh.



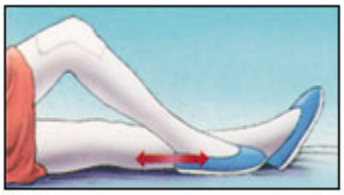
Ankle Pumps - Move your foot up and down rhythmically by contracting the calf and shin muscles. Perform this exercise periodically for two to three minutes, two or three times an hour in the recovery room. Continue this exercise until you are fully recovered and all ankle and lower-leg swelling has subsided.



Knee Straightening Exercises - Place a small rolled towel just above your heel so that it is not touching the bed. Tighten your thigh. Try to fully straighten your knee and to touch the back of your knee to the bed. Hold fully straightened for five to 10 seconds. Repeat until your thigh feels fatigued.



Bed-Supported Knee Bends - Bend your knee as much as possible while sliding your foot on the bed. Hold your knee in a maximally bent position for 5 to 10 seconds and then straighten. Repeat several times until your leg feels fatigued or until you can completely bend your knee.

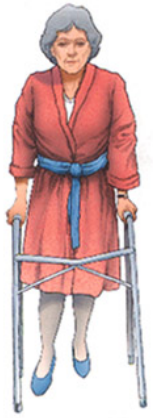


Sitting Supported Knee Bends - While sitting at bedside or in a chair with your thigh supported, place your foot behind the heel of your operated knee for support. Slowly bend your knee as far as you can. Hold your knee in this position for 5 to 10 seconds. Repeat several times until your leg feels fatigued or until you can completely bend your knee.

Sitting Unsupported Knee Bends - While sitting at bedside or in a chair with your thigh supported, bend your knee as far as you can until your foot rests on the floor. With your foot lightly resting on the floor, slide your upper body forward in the chair to increase your knee bend. Hold for 5 to 10 seconds. Straighten your knee fully. Repeat several times until your leg feels fatigued or until you can completely bend your knee.

Early Activity

Soon after your surgery, you will begin to walk short distances in your hospital room and perform everyday activities. This early activity aids your recovery and helps your knee regain its strength and movement.



Walking - Proper walking is the best way to help your knee recover. At first, you will walk with a walker or crutches. Your surgeon or therapist will tell you how much weight to put on your leg. Stand comfortably and erect with your weight evenly balanced on your walker or crutches. Advance your walker or crutches a short distance; then reach forward with your operated leg with your knee straightened so the heel of your foot touches the floor first. As you move forward, your knee and ankle will bend and your entire foot will rest evenly on the floor. As you complete the step, your toe will lift off the floor and your knee and hip will bend so that you can reach forward for your next step. Remember, touch your heel first, then flatten your foot, then lift your toes off the floor.

Walk as rhythmically and smooth as you can. Don't hurry. Adjust the length of your step and speed as necessary to walk with an even pattern. As your muscle strength and endurance improve, you may spend more time walking.

You will gradually put more weight on your leg. You may use a cane in the hand opposite your surgery and eventually walk without an aid.

When you can walk and stand for more than 10 minutes and your knee is strong enough so that you are not carrying any weight on your walker or crutches (often about two to three weeks after your surgery), you can begin using a single crutch or cane. Hold the aid in the hand opposite the side of your surgery. You should not limp or lean away from your operated knee

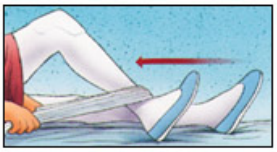
Stair Climbing and Descending - The ability to go up and down stairs requires strength and flexibility. At first, you will need a handrail for support and will be able to go only one step at a time. Always lead up the stairs with your good knee and down the stairs with your operated knee. Remember, "up with the good" and "down with the bad." You may want to have someone help you until you have regained most of your strength and mobility.

Stair climbing is an excellent strengthening and endurance activity. Do not try to climb steps higher than the standard height (7 inches) and always use a handrail for balance. As you become stronger and more mobile, you can begin to climb stairs foot over foot.

Advanced Exercises and Activities

Once you have regained independence for short distances and a few steps, you may increase your activity. The pain of your knee problems before surgery and the pain and swelling after surgery have weakened your knee. A full recovery will take many months. The following exercises and activities will help you recover fully.

Standing Knee Bends - Standing erect with the aid of a walker or crutches, lift your thigh and bend your knee as much as you can. Hold for 5 to 10 seconds. Then straighten your knee, touching the floor with your heel first. Repeat several times until fatigued.



Assisted Knee Bends - Lying on your back, place a folded towel over your operated knee and drop the towel to your foot. Bend your knee and apply gentle pressure through the towel to increase the bend. Hold for 5 to 10 seconds; repeat several times until fatigued.

Knee Exercises with Resistance - You can place light weights around your ankle and repeat any of the above exercises. These resistance exercises usually can begin four to six weeks after your surgery. Use one- to two-pound weights at first; gradually increase the weight as your strength returns. (Inexpensive wrap-around ankle weights with Velcro straps can be purchased at most sporting goods stores.)

Exercycling - Exercycling is an excellent activity to help you regain muscle strength and knee mobility. At first, adjust the seat height so that the bottom of your foot just touches the pedal with your knee almost straight. Peddle backward at first. Ride forward only after a comfortable cycling motion is possible backwards. As you become stronger (at about four to six weeks) slowly increase the tension on the exercycle. Exercycle for 10 to 15 minutes twice a day, gradually build up to 20 to 30 minutes, three or four times a week.

Pain or Swelling after Exercise - You may experience knee pain or swelling after exercise or activity. You can relieve this by elevating your leg and applying ice wrapped in a towel. Exercise and activity should consistently improve your strength and mobility. If you have any questions or problems, contact your orthopaedic surgeon or physical therapist.

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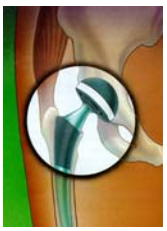
Total Hip Replacement

Whether you have just begun exploring treatment options or have already decided with your orthopaedic surgeon to undergo hip replacement surgery, this information will help you understand the benefits and limitations of this orthopaedic treatment. You'll learn how a normal hip works and the causes of hip pain, what to expect from hip replacement surgery and what exercises and activities will help restore your mobility and strength and enable you to return to everyday activities.

If your hip has been damaged by arthritis, a fracture or other conditions, common activities such as walking or getting in and out of a chair may be painful and difficult. Your hip may be stiff and it may be hard to put on your shoes and socks. You may even feel uncomfortable while resting.

If medications, changes in your everyday activities, and the use of walking aids such as a cane are not helpful, you may want to consider hip replacement surgery. By replacing your diseased hip joint with an artificial joint, hip replacement surgery can relieve your pain, increase motion, and help you get back to enjoying normal, everyday activities.

First performed in 1960, hip replacement surgery is one of the most important surgical advances of the last century. Since then, improvements in joint replacement surgical techniques and technology have greatly increased the effectiveness of this surgery. Today, more than 193,000 total hip replacements are performed each year in the United States. Similar surgical procedures are performed on other joints, including the knee, shoulder, and elbow.



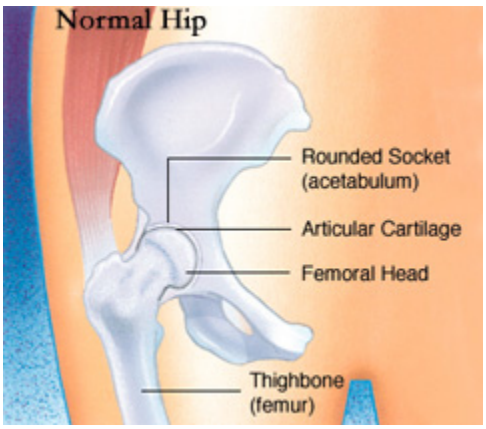
How the Normal Hip Works

The hip is one of your body's largest weight-bearing joints. It consists of two main parts: a ball (femoral head) at the top of your thighbone (femur) that fits into a rounded socket (acetabulum) in your pelvis. Bands of tissue called ligaments (hip capsule) connect the ball to the socket and provide stability to the joint.

The bone surfaces of your ball and socket have a smooth durable cover of articular cartilage that cushions the ends of the bones and enables them to move easily.

A thin, smooth tissue called synovial membrane covers all remaining surfaces of the hip joint. In a healthy hip, this membrane makes a small amount of fluid that lubricates and almost eliminates friction in your hip joint.

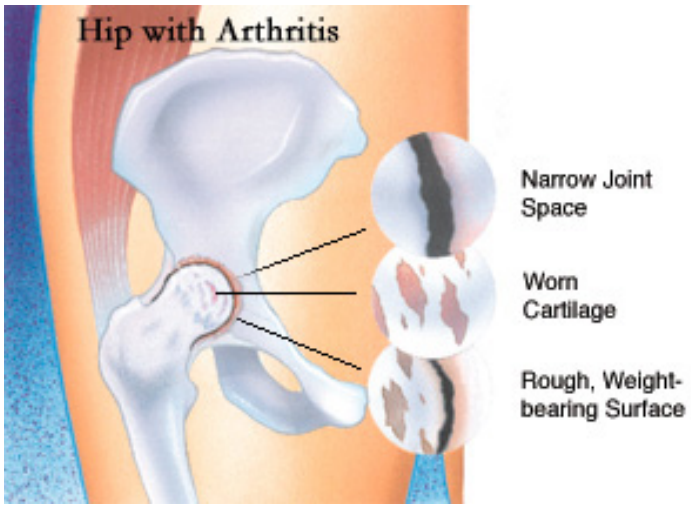
Normally, all of these parts of your hip work in harmony, allowing you to move easily and without pain.



Common Causes of Hip Pain and Loss of Hip Mobility

The most common cause of chronic hip pain and disability is arthritis. Osteoarthritis, rheumatoid arthritis, and traumatic arthritis are the most common forms of this disease.

Osteoarthritis usually occurs after age 50 and often in an individual with a family history of arthritis. It may be caused or accelerated by subtle irregularities in how the hip developed. In this form of the disease, the articular cartilage cushioning the bones of the hip wears away. The bones then rub against each other, causing hip pain and stiffness.



Rheumatoid Arthritis is an autoimmune disease in which the synovial membrane becomes inflamed, produces too much synovial fluid, and damages the articular cartilage, leading to pain and stiffness.

Traumatic Arthritis can follow a serious hip injury or fracture. A hip fracture can cause a condition known as avascular necrosis. The articular cartilage becomes damaged and, over time, causes hip pain and stiffness.

Is Hip Replacement Surgery for You?

The decision whether to have hip replacement surgery should be a cooperative one between you, your family, your primary care doctor, and your orthopaedic surgeon. The process of making this decision typically begins with a referral by your doctor to an orthopaedic surgeon for an initial evaluation.

Although many patients who undergo hip replacement surgery are age 60 to 80, orthopaedic surgeons evaluate patients individually. Recommendations for surgery are based on the extent of your pain, disability and general health status, not solely on age.

You may benefit from hip replacement surgery if:

- Hip pain limits your everyday activities such as walking or bending.
- Hip pain continues while resting, either day or night.
- Stiffness in a hip limits your ability to move or lift your leg.
- You have little pain relief from anti-inflammatory drugs or glucosamine sulfate.
- You have harmful or unpleasant side effects from your hip medications.
- Other treatments such as physical therapy or the use of a gait aid such as a cane don't relieve hip pain.

The Orthopaedic Evaluation

Your orthopaedic surgeon will review the results of your evaluation with you and discuss whether hip replacement surgery is the best method to relieve your pain and improve your mobility. Other treatment options such as medications, physical therapy or other types of surgery also may be considered.

Your orthopaedic surgeon will explain the potential risks and complications of hip replacement surgery, including those related to the surgery itself and those that can occur over time after your surgery. These risks and complications are discussed later in this booklet.

- A **medical history**, in which your orthopaedic surgeon gathers information about your general health and asks questions about the extent of your hip pain and how it affects your ability to perform every day activities.
- A **physical examination** to assess your hip's mobility, strength and alignment.
- **X-rays** to determine the extent of damage or deformity in your hip.
- Occasionally, **blood tests** or **other tests** such as a Magnetic Resonance Imaging (MRI) or a bone scan may be needed to determine the condition of the bone and soft tissues of your hip.

What to Expect from Hip Replacement Surgery

An important factor in deciding whether to have hip replacement surgery is understanding what the procedure can and can't do.

Most people who undergo hip replacement surgery experience a dramatic reduction of hip pain and a significant improvement in their ability to perform the common activities of daily living. However, hip replacement surgery will not enable you to do more than you could before your hip problem developed.

Following surgery, you will be advised to avoid certain activities, including jogging and high-impact sports, for the rest of your life. You may be asked to avoid specific positions of the joint that could lead to dislocation.

Even with normal use and activities, an artificial joint (prosthesis) develops some wear over time. If you participate in high-impact activities or are overweight, this wear may accelerate and cause the prosthesis to loosen and become painful

Preparing for Surgery

Medical Evaluation. If you decide to have hip replacement surgery, you may be asked to have a complete physical by your primary care doctor before your surgery. This is needed to assess your health and find conditions that could interfere with your surgery or recovery.

Tests. Several tests such as blood samples, a cardiogram, chest X-rays and urine samples may be needed to help plan your surgery.

Preparing Your Skin. Your skin should not have any infections or irritations before surgery. If either is present, contact your orthopaedic surgeon for a program to improve your skin before your surgery.

Blood Donations. You may be advised to donate your own blood prior to surgery. It will be stored in case you need blood after surgery.

Medications. Tell your orthopaedic surgeon about the medications you are taking. Your orthopaedist or your primary care doctor will advise you which medications you should stop or can continue taking before surgery.

Weight Loss. If you are overweight, your doctor may ask you to lose some weight before surgery to minimize the stress on your new hip, and possibly decrease the risks of surgery

Dental Evaluation. Although infections after hip replacement are not common, an infection can occur if bacteria enter your bloodstream. Because bacteria can enter the bloodstream during dental procedures, you should consider getting treatment for significant dental diseases (including tooth extractions and periodontal work) before your hip replacement surgery. Routine cleaning of your teeth should be delayed for several weeks after surgery.

Urinary Evaluation. Individuals with a history of recent or frequent urinary infections and older men with prostate disease should consider a urological evaluation before surgery.

Social Planning. Although you will be able to walk with crutches or a walker soon after surgery, you will need some help for several weeks with such tasks as cooking, shopping, bathing and laundry. If you live alone, your surgeon's office, a social worker, or a discharge planner at the hospital can help you make advance arrangements to have someone assist you at your home. A short stay in an extended care facility during your recovery after surgery also may be arranged.

Home Planning

Here are some items and home modifications that will make your return home easier during your recovery.

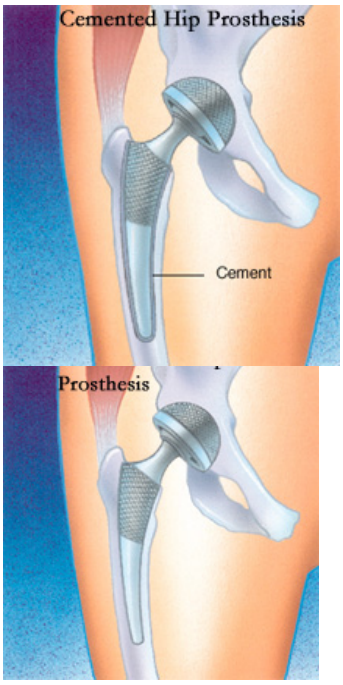
- Securely fastened safety bars or handrails in your shower or bath
- Secure handrails along all stairways
- A stable chair for your early recovery with a firm seat cushion that allows your knees to remain lower than your hips, a firm back and two arms
- A raised toilet seat
- A stable shower bench or chair for bathing
- A long-handled sponge and shower hose
- A dressing stick, a sock aid and a long-handled shoe horn for putting on and taking off shoes and socks without excessively bending your new hip
- A reacher that will allow you to grab objects without excessive bending of your hips
- Firm pillows to sit on that keep your knees lower than your hips for your chairs, sofas and car
- Removal of all loose carpets and electrical cords from the areas where you walk in your home

Your Surgery

You will most likely be admitted to the hospital on the day of your surgery. Prior to admission, a member of the anesthesia team will evaluate you. The most common types of anesthesia for hip replacement surgery are **general anesthesia** (which puts you to sleep throughout the procedure and uses a machine to help you breath) or **spinal anesthesia** (which allows you to breath on your own but anesthetizes your body from the waist down). The anesthesia team will discuss these choices with you and help you decide which type of anesthesia is best for you.

Surgical Procedure

The surgical procedure takes a few hours. Your orthopaedic surgeon will remove the damaged cartilage and bone, then position new metal, plastic or ceramic joint surfaces to restore the alignment and function of your hip.



Many different types of designs and materials are currently used in artificial hip joints. All of them consist of two basic components: the ball component (made of a highly polished strong metal or ceramic material) and the socket component (a durable cup of plastic, ceramic or metal, which may have an outer metal shell).

Special surgical cement may be used to fill the gap between the prosthesis and remaining natural bone to secure the artificial joint.

A noncemented prosthesis has also been developed which is used most often in younger, more active patients with strong bone. The prosthesis may be coated with textured metal or a special bone-like substance, which allows bone to grow into the prosthesis.

A combination of a cemented ball and a noncemented socket may be used.

Your orthopaedic surgeon will choose the type of prosthesis that best meets your needs.

After surgery, you will be moved to the recovery room where you will remain for one to two hours while your recovery from anesthesia is monitored. After you awaken fully, you will be taken to your hospital room.

A special note about minimally invasive total hip replacement.
Over the past several years, orthopaedic surgeons have been developing new techniques, known as minimally invasive hip replacement surgery, for inserting total hip replacements through smaller incisions. It is hoped, but not yet proven, that this may allow for quicker, less painful recovery and more rapid return to normal activities. Minimally invasive and small incision total hip replacement surgery is a rapidly evolving area. While certain techniques have proven to be safe, others may be associated with an increased risk of complications such as nerve and artery injuries, wound healing problems, infection, fracture of the femur and malposition of the implants, which can contribute to premature wear, dislocation and loosening of your hip replacement. Patients who have marked deformity of the joint, those who are heavy or muscular, and those who have other health problems, which can contribute to wound healing problems, appear to be at higher risk of problems. Your orthopaedic surgeon can talk to you about his or her experience with minimally invasive hip replacement surgery and the possible risks and benefits of minimally invasive hip replacement surgery. The AAOS and the American Association of Hip and Knee Surgeons have developed information for patients about minimally invasive hip replacement surgery.

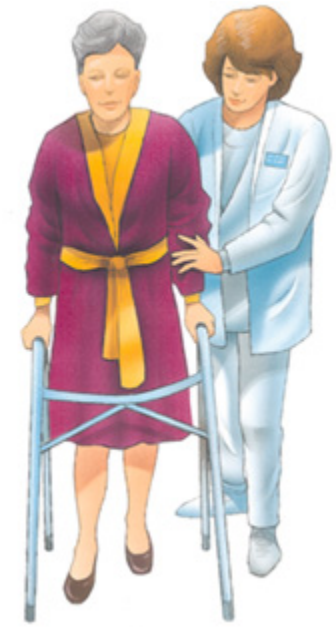
Your Stay in the Hospital
You will usually stay in the hospital for a few days. After surgery, you will feel pain in your hip. Pain medication will be given to make you as comfortable as possible.

To avoid lung congestion after surgery, you will be asked to breathe deeply and cough frequently.

To protect your hip during early recovery, a positioning splint, such as a V-shaped pillow placed between your legs, may be used.

Walking and light activity are important to your recovery and will begin the day of or the day after your surgery. Most hip replacement patients begin standing and walking with the help of a walking support and a physical therapist the day after surgery. The physical therapist will teach you specific exercises to strengthen your hip and restore movement for walking and other normal daily activities.

Possible Complications after Surgery
The complication rate following hip replacement surgery is low. Serious complications, such as joint infection, occur in less than 2 percent of patients. Major medical complications, such as heart attack or stroke, occur even less frequently. However, chronic illnesses may increase the potential for complications. Although uncommon, when these complications occur they can prolong or limit your full recovery.



Blood clots in the leg veins or pelvis are the most common complication of hip replacement surgery. Your orthopaedic surgeon may prescribe one or more measures to prevent blood clots from forming in your leg veins or becoming symptomatic. These measure may include special support hose, inflatable leg coverings, ankle pump exercises and blood thinners.

Leg-length inequality may occur or may become or seem worse after hip replacement. Your orthopaedic surgeon will take this into account, in addition to other issues, including the stability and biomechanics of the hip. Some patients may feel more comfortable with a shoe lift after surgery.

Other complications such as dislocation, nerve and blood vessel injury, bleeding, fracture and stiffness can occur. In a small number of patients, some pain can continue, or new pain can occur after surgery.

Over years, the hip prosthesis may wear out or loosen. This problem will likely be less common with newer materials and techniques. When the prosthesis wears, bone loss may occur because of the small particles produced at the wearing surface. This process is called osteolysis.
Your recovery at home

The success of your surgery will depend in large measure on how well you follow your orthopaedic surgeon's instructions regarding home care during the first few weeks after surgery

Wound Care. You will have stitches or staples running along your wound or a suture beneath your skin. The stitches or staples will be removed about two weeks after surgery.

Avoid getting the wound wet until it has thoroughly sealed and dried. A bandage may be placed over the wound to prevent irritation from clothing or support stockings.

Diet. Some loss of appetite is common for several weeks after surgery. A balanced diet, often with an iron supplement, is important to promote proper tissue healing and restore muscle strength. Be sure to drink plenty of fluids.

Activity. Exercise is a critical component of home care, particularly during the first few weeks after surgery. You should be able to resume most normal light activities of daily living within three to six weeks following surgery. Some discomfort with activity and at night is common for several weeks.

Your activity program should include:

- A graduated walking program, initially in your home and later outside
- Walking program to slowly increase your mobility and endurance
- Resuming other normal household activities
- Resuming sitting, standing, walking up and down stairs
- Specific exercises several times a day to restore movement
- Specific exercises several times a day to strength your hip joint
- May wish to have a physical therapist help you at home

Avoiding Problems after Surgery

Blood Clot Prevention. Follow your orthopaedic surgeon's instructions carefully to minimize the potential risk of blood clots, which can occur during the first several weeks of your recovery.

Warning signs of possible blood clots include:

- Pain in your calf and leg, unrelated to your incision
- Tenderness or redness of your calf
- Swelling of your thigh, calf, ankle or foot

Warning signs that a blood clot has traveled to your lung include:

- Shortness of breath
- Chest pain, particularly with breathing

Notify your doctor immediately if you develop any of these signs.

Preventing Infection

The most common causes of infection following hip replacement surgery are from bacteria that enter the bloodstream during dental procedures, urinary tract infections, or skin infections. These bacteria can lodge around your prosthesis.

Following your surgery, you may need to take antibiotics prior to dental work, including dental cleanings, or any surgical procedure that could allow bacteria to enter your bloodstream. For many patients with a normal immune system the AAOS and ADA recommend dental prophylaxis for two years after a primary total joint surgery. A complete discussion of this topic is available on the AAOS patient education Web site, Your Orthopaedic Connection.

Warning signs of a possible hip replacement infection are:

- Persistent fever (higher than 100 degrees orally)
- Shaking chills
- Increasing redness, tenderness or swelling of the hip wound
- Drainage from the hip wound
- Increasing hip pain with both activity and rest

Notify your doctor immediately if you develop any of these signs.

Avoiding Falls

A fall during the first few weeks after surgery can damage your new hip and may result in a need for more surgery. Stairs are a particular hazard until your hip is strong and mobile. You should use a cane, crutches, a walker or handrails, or have someone help you until you improve your balance, flexibility and strength.

Your surgeon and physical therapist will help you decide what assistive aides will be required following surgery, and when those aides can safely be discontinued.

Other Precautions
To assure proper recovery and prevent dislocation of the prosthesis, you must take special precautions. Do not cross your legs. Do not bend your hips more than a right angle (90 degrees). Do not turn your feet excessively inward or outward. Use a pillow between your legs at night when sleeping until you are advised by your orthopaedic surgeon that you can remove it. Your surgeon and physical therapist will give you more instructions prior to your discharge from the hospital.

How Your New Hip is Different

You may feel some numbness in the skin around your incision. You also may feel some stiffness, particularly with excessive bending. These differences often diminish with time and most patients find these are minor compared to the pain and limited function they experienced prior to surgery.

our new hip may activate metal detectors required for security in airports and some buildings. Tell the security agent about your hip replacement if the alarm is activated. You may ask your orthopaedic surgeon for a card confirming that you have an artificial hip.

After surgery, make sure you also do the following:

- Participate in a regular light exercise program to maintain proper strength and mobility of your new hip.
- Take special precautions to avoid falls and injuries. Individuals who have undergone hip replacement surgery and suffer a fracture may require more surgery.
- Notify your dentist that you have had a hip replacement. You will need to take antibiotics before any dental procedure for a minimum of two years after your surgery and possibly longer, depending on your past health history. Guidelines for the use of antibiotics for your surgeon and dentist are available from the AAOS and the American Dental Association.
- See your orthopaedic surgeon periodically for routine follow-up examinations and X-rays, even if your hip replacement seems to be doing fine.

Your orthopaedic surgeon is a medical doctor with extensive training in the diagnosis and nonsurgical and surgical treatment of the musculoskeletal system, including bones, joints, ligaments, tendons, muscles, and nerves.

January 2006 http://orthoinfo.aaos.org/fact/thr_report.cfm?Thread_ID=504&topcategory=Joint%20Replacement

Activities after a Hip Replacement

Description

After a hip replacement, you may expect your lifestyle after the surgery to be a lot like the way it was before, but without the pain. In many ways, you are right, but it will take time. You need to be a partner in the healing process to ensure a successful outcome.

You will be able to resume most activities; however, you may have to change how you do them. For example, you will have to learn new ways of bending down that keep your new hip safe. The suggestions you find here will help you enjoy your new hip while you safely resume your daily routines.

Activities in the Hospital

Hip replacement is major surgery and, for the first few days, you'll want to take it easy. However, it's important that you start some activities immediately to deal with the effects of the anesthetic, help the healing and keep blood clots from forming in your leg veins. Your doctor and physical and occupational therapists can give you specific instructions on wound care, pain control, diet and exercise. Ask how much weight you can put on your affected leg.

Pain management is important in your early recovery. Although pain after surgery is quite variable and not entirely predictable, it does need to be controlled with medication. Initially, you may get pain medication through an IV (intravenous) tube that you can control to get the amount of medication you need. It is easier to prevent pain than to control it and you don't have to worry about becoming addicted to the medication; after a day or two, injections or pills will replace the IV.

Besides the pain medication, you will also need antibiotics and blood-thinners to help prevent blood clots from forming in the veins of your thigh and calf.

You may lose your appetite and feel nauseous or constipated for a couple of days. These are ordinary reactions. You may have a urinary catheter inserted during surgery and be given stool softeners or laxatives to ease the constipation caused by the pain medication after surgery. You will be taught to do breathing exercises to keep your chest and lungs clear.

A physical therapist will visit you, usually on the day after your surgery, and teach you how to use your new joint. It is important that you get up and about as soon as possible after hip replacement surgery. Even in bed, you can "pedal" your feet and "pump" your ankles regularly to keep blood flowing in your legs. You may have to wear elastic stockings and/or a pneumatic sleeve to help keep blood flowing freely.

Discharge

Your hospital stay may last from 3 to 10 days, until you can perform certain skills you'll need to use at home. If you go straight home, you will need help at home for several weeks. If going straight home is too difficult, you may need to spend some time at a rehabilitation center.

The following tips can make your homecoming easier.

- In the kitchen (and in other rooms as well), place items you use frequently within reach so you don't have to reach up or bend down.
- Rearrange furniture so you can get about on a walker or crutches. You may want to change rooms (make the living room your bedroom, for example) to stay off the stairs.
- Get a good chair, one that is firm and has a higher-than-average seat. This type of chair is safer and more comfortable than a low, soft-cushioned chair.

- Remove any throw rugs or area rugs that could cause you to slip. Securely fasten electrical cords around the perimeter of the room.
- Install a shower chair, grab bar and raised toilet in the bathroom.
- Use assistive devices such as a long-handled shoehorn, a long-handled sponge and a grabbing tool or reacher to avoid bending too far over. Wear a big-pocket shirt or soft shoulder bag for carrying things.
- Set up a "recovery center" in your home, with a phone, television remote control, radio, facial tissues, wastebasket, pitcher and glass, reading materials and medications within easy reach.

Activities at Home

- Keep the skin clean and dry. The dressing applied in the hospital should be changed as necessary. Ask for instructions on how to change the dressing if you are not sure.
- If you have stitches that need to be removed, your surgeon will give you specific instructions about the incision and when you can bathe. X-rays will be taken later to ensure that the joint is healing properly.
- Notify your doctor if the wound appears red or begins to drain.
- Take your temperature twice daily and notify your doctor if it exceeds 100.5°F.
- Swelling is normal for the first 3 to 6 months after surgery. Elevate your leg slightly and apply an ice pack for 15 to 20 minutes at a time, a few times a day.
- Calf pain, chest pain and shortness of breath are signs of a possible blood clot. Notify your doctor immediately if you notice any of these symptoms.

Medication: Take all medications as directed. You will probably be given a blood thinner to prevent life-threatening clots from forming in the veins of your calf and thigh. If a blood clot forms and then breaks free, it could travel to your lungs, resulting in a pulmonary embolism, a potentially fatal condition.

Because you have an artificial joint, it is especially important to prevent any bacterial infections from settling in your joint implant. You should get a medical alert card and take antibiotics whenever there is the possibility of a bacterial infection, such as when you have dental work. Be sure to notify your dentist that you have a joint implant and let your doctor know if your dentist schedules an extraction, periodontal work, dental implant or root canal. The AAOS and the American Dental Association have prepared guidelines that say when you should get antibiotics to prevent joint infection if you must have dental work. You'll find a link to these guidelines at the end of this article.

Diet: By the time you leave the hospital, you should be eating your normal diet. Your physician may recommend that you take iron and vitamin supplements. Continue to drink plenty of fluids and avoid excessive intake of vitamin K while you are taking the blood-thinner medication. Foods rich in vitamin K include broccoli, cauliflower, Brussels sprouts, liver, green beans, garbanzo beans, lentils, soybeans, soybean oil, spinach, kale, lettuce, turnip greens, cabbage and onions. Try to limit your intake of coffee and alcohol. You should watch your weight to avoid putting more stress on the joint.

Resuming normal activities: Once you get home, you should stay active. The key is not to overdo it! While you can expect some good days and some bad days, you should notice a gradual improvement over time. Generally, the following guidelines will apply:

Weight bearing: Be sure to discuss weight bearing with your physician and physical therapist. Their recommendations will depend on the type of implant and other factors in your situation. Revision hip surgery (replacing an artificial joint that fails) may require you to wait a longer time without putting weight on the leg.

- **Uncemented** hip replacement: Your surgeon will give you specific instructions about the use of crutches or a walker and when you can put weight on the leg. By 8 weeks, you should be weight bearing with only a little support. This protects the joint and gives the bone time to grow into the porous coating of the implant.
- **Cemented** or hybrid hip replacement: Using a cane or walker, you can put some weight on the leg immediately, but should continue to use some support for 4 to 6 weeks to help the muscles recover.

Driving: You can begin driving an automatic shift car in 4 to 8 weeks, provided you are no longer taking narcotic pain medication. If you have a stick-shift car and your right hip was replaced, do not begin driving until your doctor says you can. The physical therapist will show you how to slide in and out of the car safely. Placing a plastic bag on the seat can help.

Sex: Some form of sexual relations can be safely resumed 4 to 6 weeks after surgery. Ask your doctor if you need more information.

Sleeping positions: Sleep on your back with your legs slightly apart or on your side with an abduction pillow, a regular pillow between your knees or a knee immobilizer at night. Be sure to use the pillow for at least 6 weeks, or until your doctor says you can do without it. Sleeping on your stomach should be all right.

Sitting: For at least the first 3 months, sit only in chairs that have arms. Do not sit on low chairs, low stools or reclining chairs. Do not cross your legs at the knees. The physical therapist will show you how to sit and stand from a chair, keeping your affected leg out in front of you. Get up and move around on a regular basis, at least once every hour.

Going up and down stairs: Stair climbing should be limited if possible until healing is far enough along. If you must go up stairs:

- The unaffected leg should step up first.
- Then bring the affected leg up to the same step.
- Then bring your crutches or canes up.

To go down stairs, reverse the process.

- Put your crutches or canes on the lower step.
- Next, bring the affected leg down to that step.
- Finally step down with the unaffected leg.

Return to work: Depending on the type of activities you perform, it may be as long as 3 to 6 months before you can return to work.

Other activities: Walk as much as you like once your doctor gives you the go-ahead, but remember that walking is no substitute for your prescribed exercises. Walking with a pair of trekking poles is helpful and adds as much as 40 percent to the exercise you get when you walk. Swimming is also recommended; you can begin as soon as the sutures have been removed and the wound is healed, approximately 6 to 8 weeks after surgery. Using a pair of training fins may make swimming a more enjoyable and effective exercise. Acceptable activities include dancing, golfing (with spikeless shoes and a cart) and bicycling (on level surfaces). Avoid activities that involve impact stress on the joint such as tennis or badminton, contact sports (football, baseball), squash or racquetball, jumping, or jogging. Lifting weights is not a problem, but carrying heavy, awkward objects that cause you to stagger is not wise, especially if you must go up and down stairs or slopes. Plan ahead to have a cart, dolly or hand-truck available.

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