WELCOME TO THE
IHSS TRAINING ACADEMY

ELECTIVE: MEDICAL IMPLICATIONS

The IHSS Training Academy provides courses that are designed to enhance the participant's skills in completing individual assessments and authorization of IHSS services.

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."

This course utilizes lecture, discussion, group, and individual activities to deliver course content.

Objectives:
By the end of this training, participants will be able to:

1. Identify how common medical conditions, diseases and procedures affect functionality and authorization of services.
2. Describe the impacts of caregiving and resources that can be utilized for services not covered by IHSS.
3. Identify medication issues common in the elderly and those with complex medical conditions.
4. Identify common fall risks for the elderly and ways to minimize that risk.
5. Describe how pain can affect the assessment of needs for IHSS services.
6. Demonstrate the use of resources provided in the training in order to clarify medication and disease related information.

IHSS TRAINING ACADEMY
ELECTIVE: MEDICAL IMPLICATIONS

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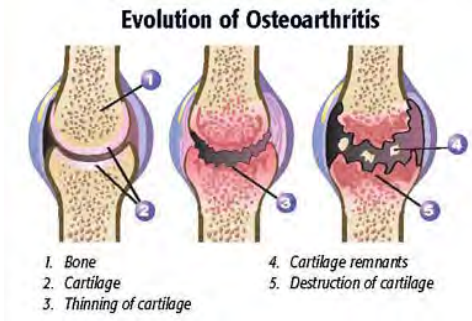
Welcome to the California Department of Social Services' In-Home Supportive Services Training Academy

Overview of *Medical Implications*

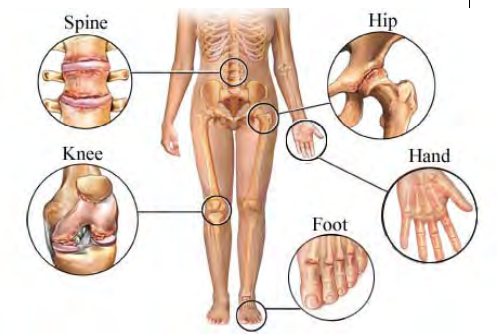
- Information about Conditions, Diseases and Procedures
- Medication Management
- Chronic Pain
- Falls
- Use of Training Resources
- Caregiver Issues

What do you know?

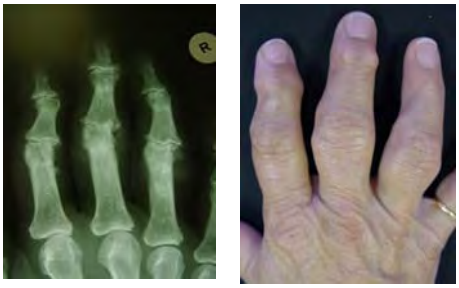
Osteoarthritis



Osteoarthritis



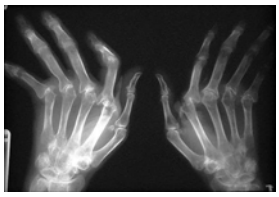
Osteoarthritis

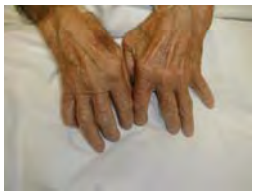


Typical clinical presentation

Rheumatoid Arthritis

Characteristic hand joint involvement

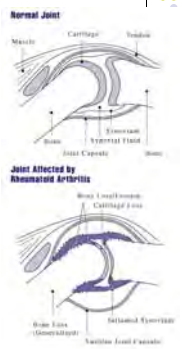




Rheumatoid Arthritis

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

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

Rheumatoid

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

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

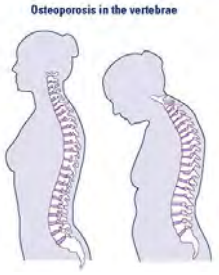
- Reduced bone strength leads to an increased risk of fractures or broken bones.
- Most often break bones in the hip, spine, and wrist.
- Is often called a **"silent disease"** because it usually progresses without any symptoms until a fracture occurs.
- More often seen in women with a greater incidence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

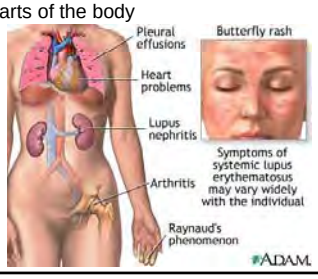
Autoimmune Diseases

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

Lupus

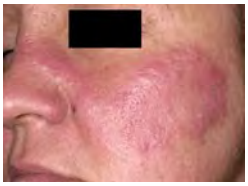
Characteristics

- 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

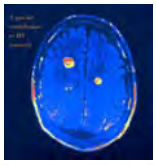


Lupus

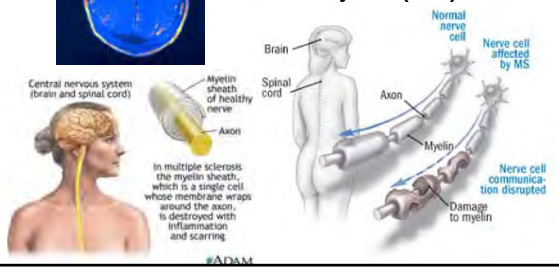
- Most common symptoms of lupus are:
  - Pain or swelling in joints
  - Muscle pain
  - Fever with no known cause
  - Red rashes, most often on the face
  - Chest pain when taking a deep breath
  - Hair loss
  - Pale or purple fingers or toes
  - Sensitivity to the sun
  - Swelling in legs or around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



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

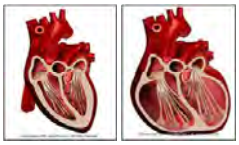
Categories for Blood Pressure Levels in Adults (in mmHg, millimeters of mercury)[a]

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

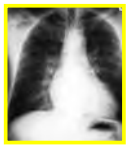


CHF

Functional Considerations

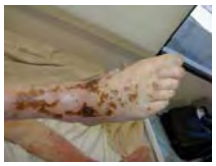
The weakening of the heart's pumping ability causes:

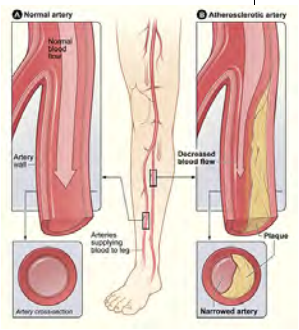
- Shortness of breath or difficulty breathing
- Feeling tired
- Swelling in the ankles, feet, legs, and sometimes the abdomen



Peripheral Arterial Disease (PAD)

Also known as atherosclerotic peripheral arterial disease.

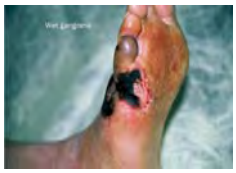




PAD

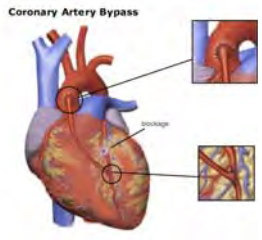
Advanced stages of PAD:

- 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.



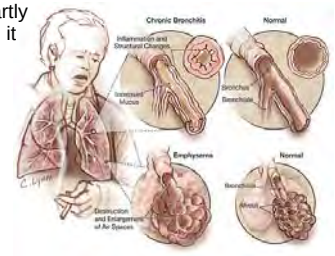
CABG

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

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

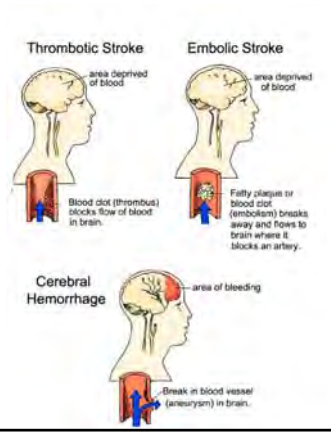
Functional Considerations

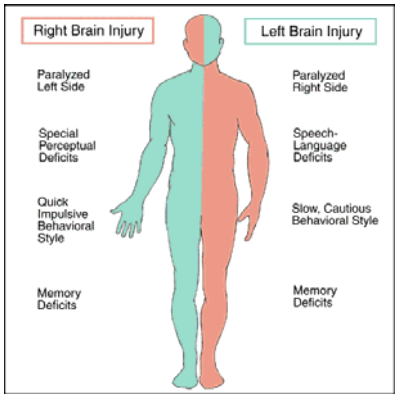
- Most all diagnosed patients will have functional limitations related to exercise intolerance.
- Spacing activities and conserving energy are helpful in maximizing functional abilities.
  - Even getting dressed may be too exerting for the consumer to perform.
- If the consumer uses oxygen, s/he may 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

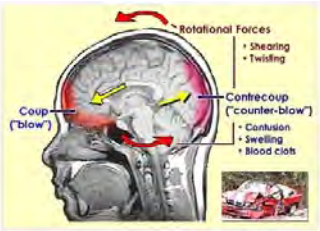
Functional Considerations

- 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



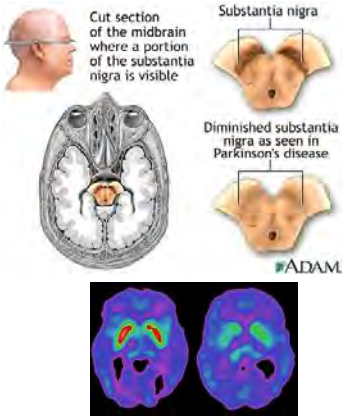
TBI

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

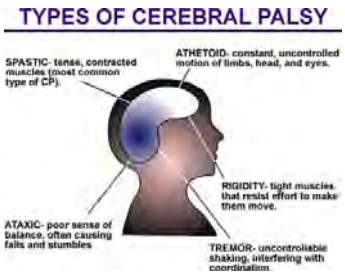
Parkinson's

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.

Cerebral Palsy

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



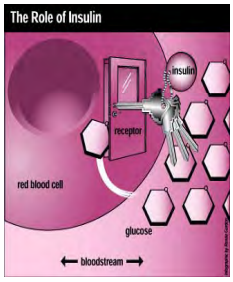
Cerebral Palsy

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

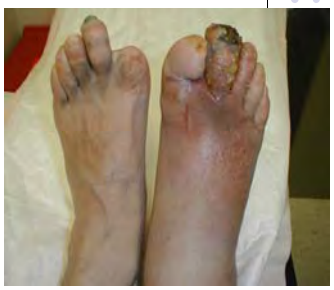
Diabetes

- 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

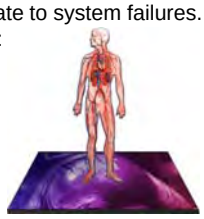
Hypoglycemia

- 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

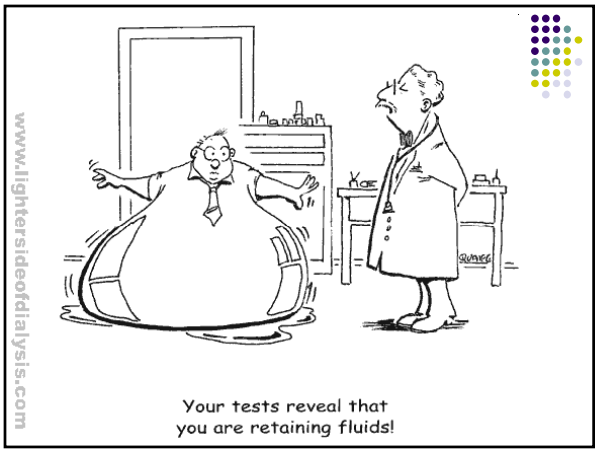


Kidney Failure

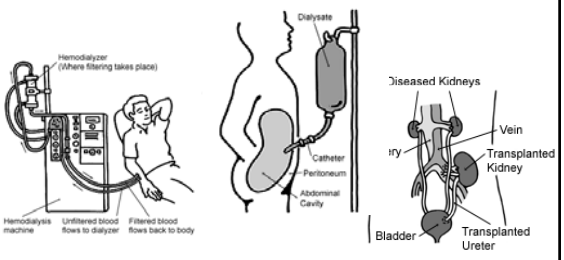
- Kidneys fail to function adequately
- Causes:
  - Diabetic nephropathy
  - High blood pressure
  - Kidney diseases
  - Inherited and congenital kidney diseases
  - Poisons and trauma
  - Over-the-counter medicines
- Buildup of wastes in the blood system
- Absence of hormones normally made in the healthy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

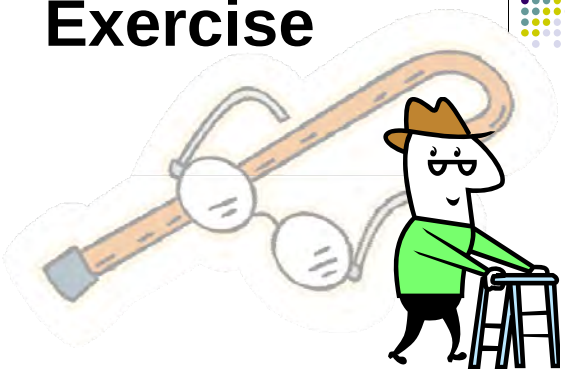
In the U.S., chronic alcoholism and hepatitis C are the most common causes.

Cirrhosis

Characteristics

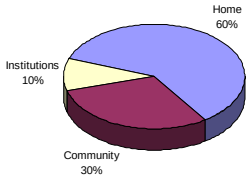
- Edema in legs and abdomen
- Bruising and bleeding
- Jaundice
- Itching
- Gallstones
- Toxins in the blood or brain
- Sensitivity to medication
- Impaired blood flow to liver
- Varices
- Insulin resistance and Type 2 diabetes
- Liver cancer
- Problems in other organs

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

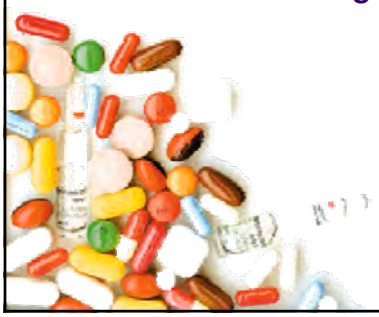
Caregiver Issues

- **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



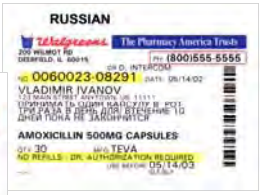
Risk Factors

Multiple Providers

Multiple medical providers
+
More than one pharmacy
=
↑ risk for medication mismanagement or adverse drug reactions

Risk Factors

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

Use the binder, Pill Book and other medication references, consider:

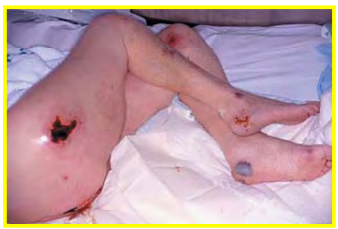
- Red flags
- Assessment implications
- Functional implications

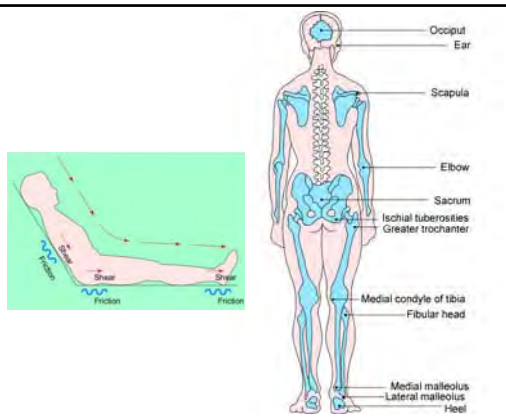
Procedures

Pressure Ulcer

Conditions that increase risk:

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



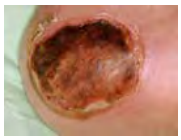


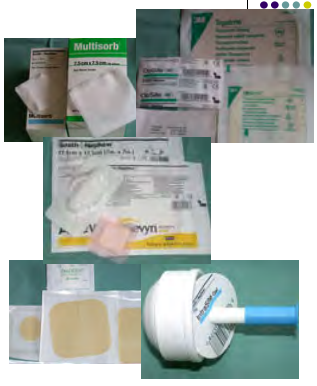
Pressure Ulcer Risk Assessment

- **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

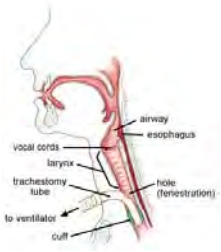
Based on Braden Risk Assessment Scale

Wound Care

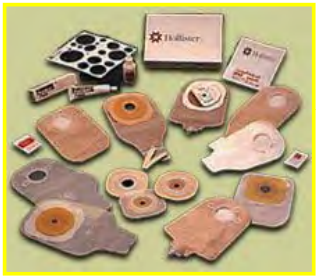




Tracheostomy Care



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 diseases are often the underlying source of chronic pain.

Chronic pain interferes with everyday life

Obstacles to Pain Management

Attitudes and Beliefs

- Don't like side effects from pain medication.
- Worried about addiction to pain medication.
- Don't think they can be helped.
- Pain is a normal part of aging.
- Pain will eventually go away if left untreated.
- Pain alone is not a serious condition.

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.


Thanks For Your
Participation!

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.

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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. FS-AD20050610

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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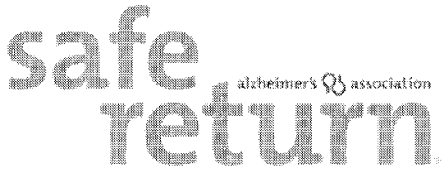
fact sheet

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

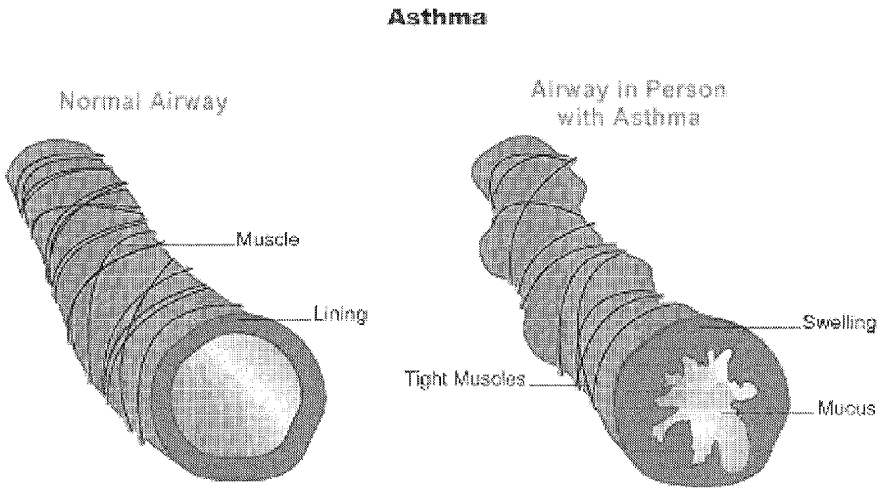
Asthma

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.

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.

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.

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.

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 Institutes of Health
Bethesda, MD 20892

4: Autoimmunity

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

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

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

6: Chronic Obstructive Pulmonary Disease (COPD)

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

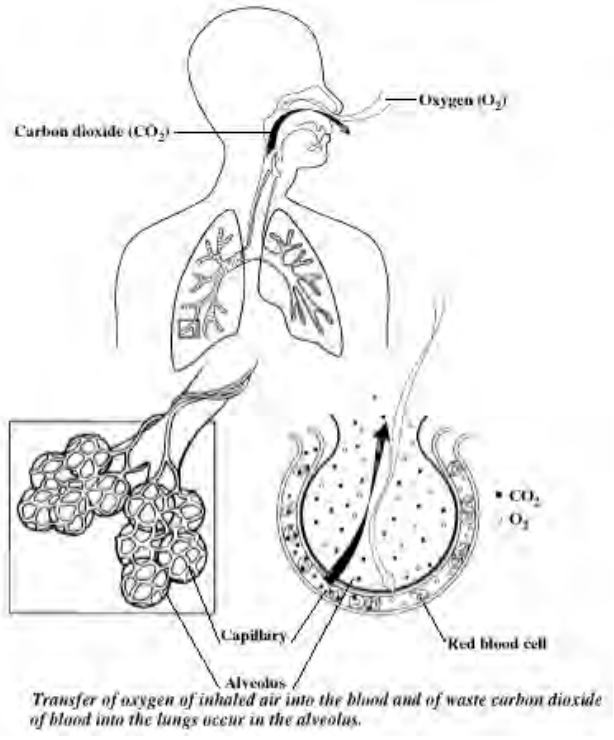
COPD

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.



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

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.

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.

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.

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.

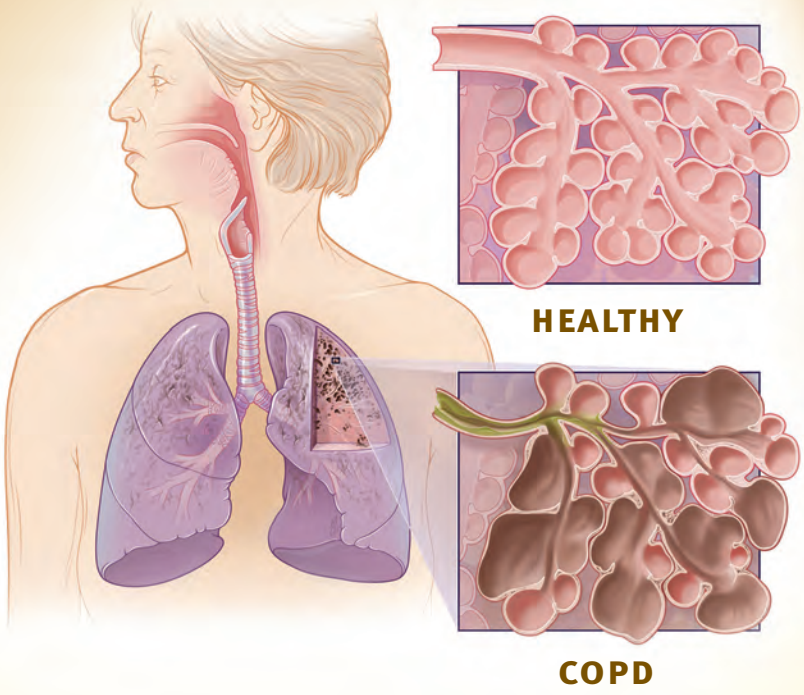
Follow Treatment Advice

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

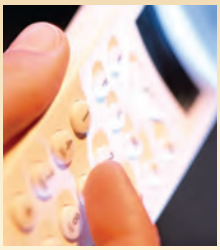
Spirometry is a simple, noninvasive breathing test that measures the amount of air a person can blow out of the lungs (volume) and how fast he or she can blow it out (flow). The spirometry reading can help your doctor assess how well your lungs are working and determine the best course of treatment.

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
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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	○ Usually develops after more than a decade of heavy drinking. ○ The amount of alcohol that can injure the liver varies greatly from person to person. ○ Alcohol seems to injure the liver by blocking the normal metabolism of protein, fats, and carbohydrates.
Chronic hepatitis C	○ 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	○ Hepatitis B virus is probably the most common cause of cirrhosis worldwide, but it is less common in the United States. ○ Causes liver inflammation and injury that over several decades can lead to cirrhosis. ○ Hepatitis D virus that infects the liver, but only in people who already have hepatitis B.
Autoimmune hepatitis	○ Immune system attacks the liver and causes inflammation, damage, and eventually scarring and cirrhosis.
Inherited diseases	○ 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)	○ Fat builds up in the liver and eventually causes scar tissue. ○ Appears to be associated with diabetes, protein malnutrition, obesity, coronary artery disease, and treatment with corticosteroid medications.
Blocked bile ducts	○ Most common cause is primary biliary cirrhosis, a disease in which the ducts become inflamed, blocked, and scarred. ○ Secondary biliary cirrhosis can happen after gallbladder surgery if the ducts are inadvertently tied off or injured.
Drugs, toxins, and infections	○ 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.

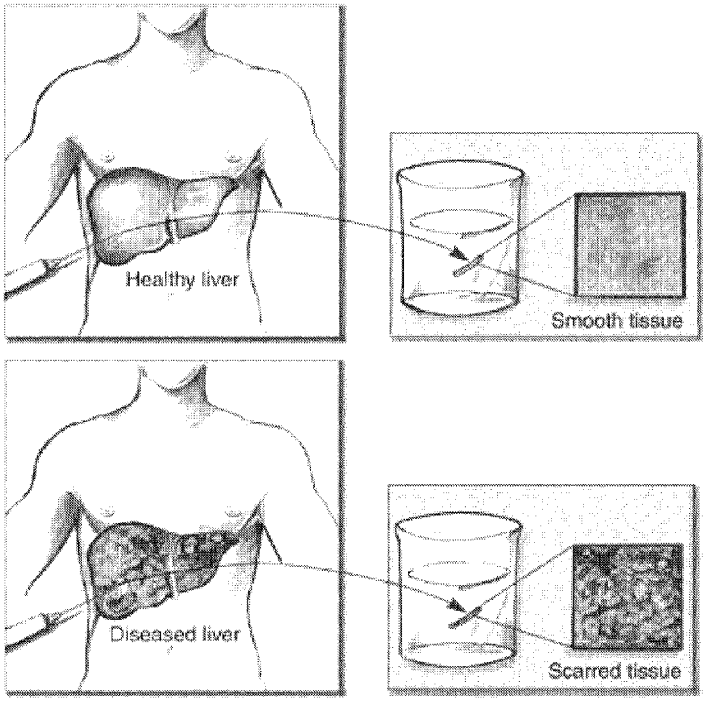
Complications of Cirrhosis

Edema and ascites	○ When the liver loses its ability to make the protein albumin, water accumulates in the legs (edema) and abdomen (ascites).
Bruising and bleeding	○ When the liver slows or stops production of the proteins needed for blood clotting, a person will bruise or bleed easily. ○ The palms of the hands may be reddish and blotchy with palmar erythema.
Jaundice	○ Jaundice is a yellowing of the skin and eyes that occurs when the diseased liver does not absorb enough bilirubin.
Itching	○ Bile products deposited in the skin may cause intense itching.
Gallstones	○ If cirrhosis prevents bile from reaching the gallbladder, gallstones may develop.
Toxins in the blood or brain	○ A damaged liver cannot remove toxins from the blood, causing them to accumulate in the blood and eventually the brain. ○ Can dull mental functioning and cause personality changes, coma, and even death. ○ 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	○ 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. ○ This causes a person to be more sensitive to medications and their side effects.
Portal hypertension	○ Cirrhosis slows the normal flow of blood through the portal vein, which increases the pressure inside it. ○ This condition is called portal hypertension.
Varices	○ 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. ○ The enlarged blood vessels are called varices. ○ They have thin walls and carry high pressure, and thus are likely to burst. ○ 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	○ Cirrhosis causes resistance to insulin. ○ The pancreas tries to keep up with the demand for insulin by producing more. ○ 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	○ Hepatocellular carcinoma, a type of liver cancer commonly caused by cirrhosis, starts in the liver tissue itself. ○ It has a high mortality rate.
Problems in other organs	○ Cirrhosis can cause immune system dysfunction, leading to infection. ○ Fluid in the abdomen (ascites) may become infected with bacteria normally present in the intestines. ○ 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 Urinc

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.

8: Congestive Heart Failure (CHF)

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

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.**

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

9: Coronary Artery Bypass Grafting (CABG)

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).

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.

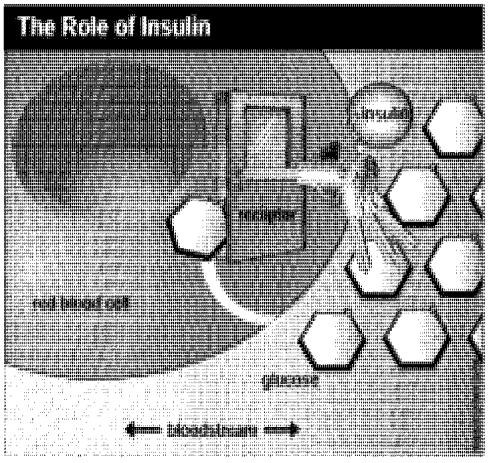
Consistently high blood sugar levels can, over time, lead to blindness, kidney failure, heart disease, limb amputations, and nerve damage. In fact, diabetes is the leading cause of new cases of blindness in adults between the ages of 20 and 74, and it accounts for 40 percent of people who have kidney 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.

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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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

NIDDK

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.

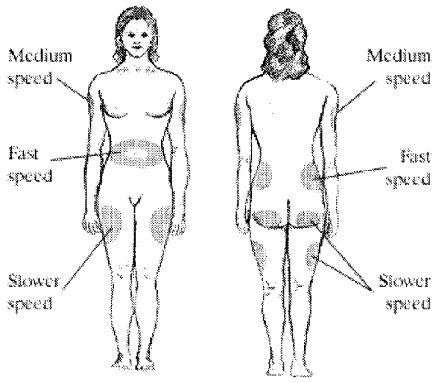
When?
Take insulin 30 minutes before a meal if using regular insulin alone or with a longer-acting insulin. If using rapid-acting insulin, shot should be given just before eating.

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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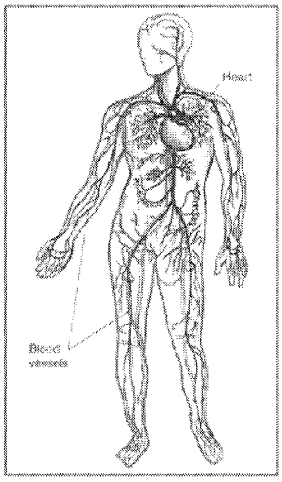
Complications of Diabetes

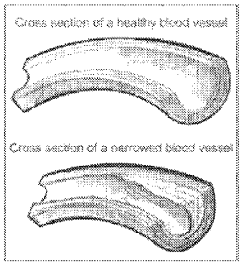


Heart Disease and Stroke

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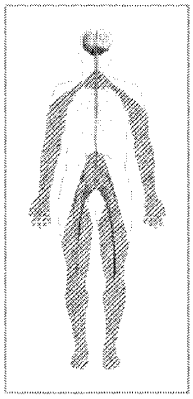
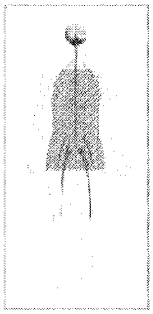
Types of Diabetic Neuropathy
Diabetic neuropathies can be classified as peripheral, autonomic, proximal, and focal. Each affects different parts of the body in different ways.

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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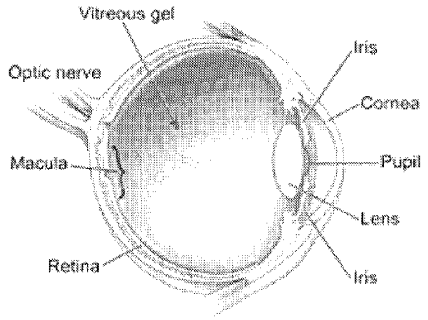
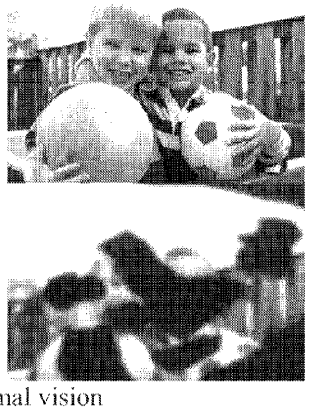
Treatment

- 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

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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

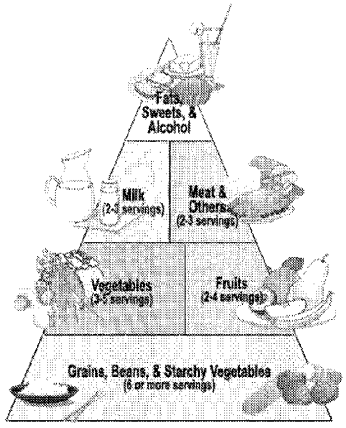
Steps to healthy eating and a healthy lifestyle to control and manage diabetes:
Begin with a healthy eating plan. Healthy eating means eating more grains, fruits, and vegetables, and less meat, sweets, and fats every day. "Let the Food be the Medicine and Medicine be the Food" (Hippocrates).

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)

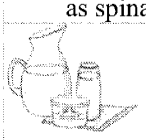
- Choose whole fruits more often than juices. They have more fiber.
- Choose fruits and fruit juices without added sweeteners or syrups.
- Choose citrus fruit such as oranges, grapefruit, or tangerines.

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



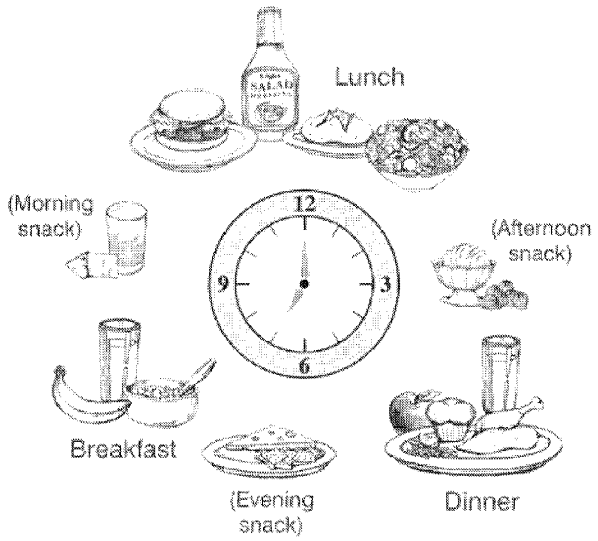
Milk: 2-3 servings/day
(source of calcium, protein, vitamins A and D)

- 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

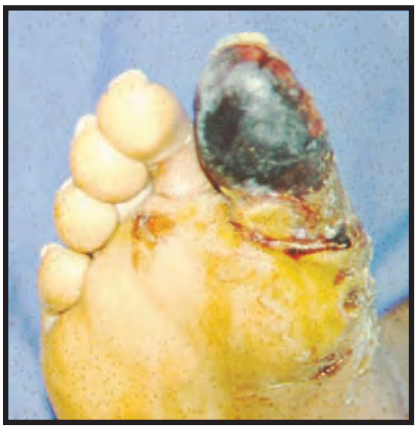
For people taking certain diabetes medicines, following a schedule for meals, snacks, and physical activity is best. However, some diabetes medicines allow for more flexibility.



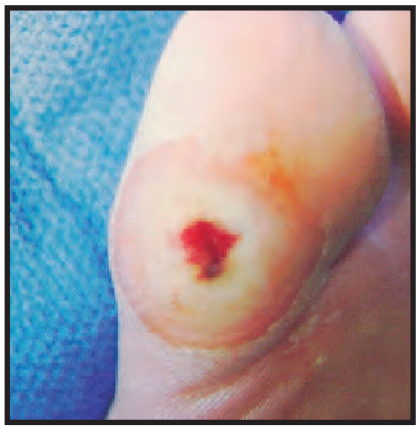
Adapted (8-07) from: National Diabetes Education Program (NDEP) http://ndep.nih.gov NIDDK, National Institutes of Health, Bethesda, MD

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.**

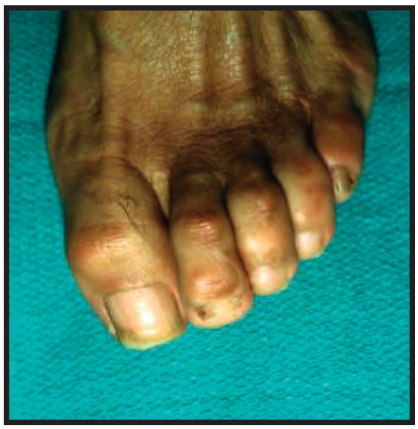
Foot Health and Diabetes



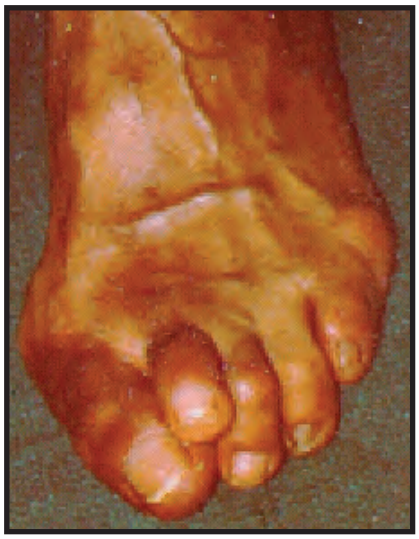
Gangrene
Severe infections may be present but undetected by patients with neuropathy who have difficulty examining their feet.



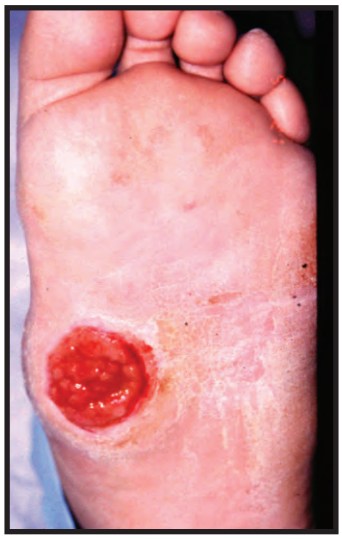
Ulceration of the great toe
This deceptively small lesion seriously increases the risk for amputation. Risk factors for amputation include: peripheral neuropathy, abnormal biomechanics, peripheral vascular disease, prior ulceration and prior amputation.



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.

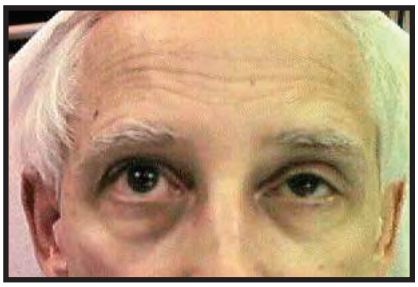


Ulceration
Even large wounds can be painless in the face of neuropathy and patients may deny there is a problem. The patient with this lesion needs referral for a program of wound management and non weight-bearing rehabilitation.

Eye Health and Diabetes

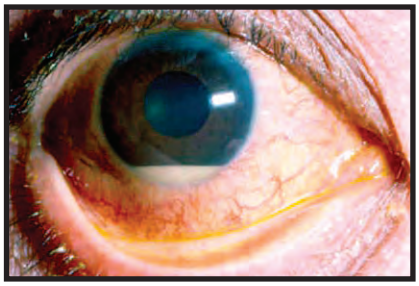
This is what a person with normal vision sees.

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.

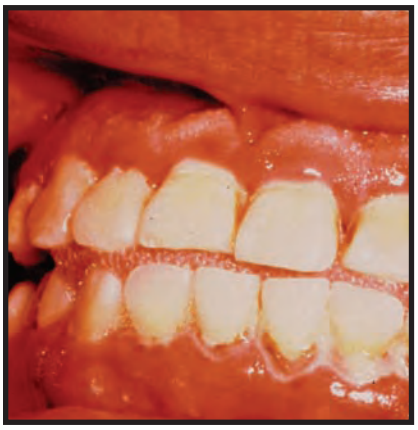
This patient with eye pain, light sensitivity, and a 2-mm white lesion has a corneal ulcer. People with diabetes may not complain of pain because of corneal neuropathy. Steroid or over-the-counter eye drops would be a serious mistake – this patent needs referral.



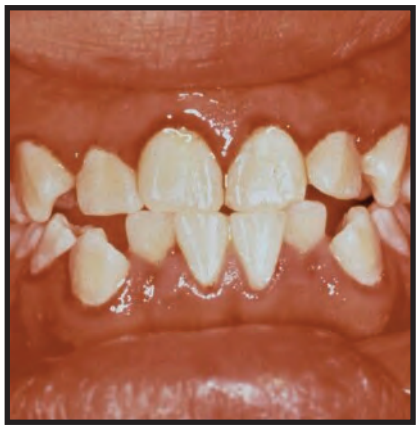
Hypopyon, white cells collecting in the anterior chamber of the eye, is a sign of serious intraocular infection and/or inflammation; this person should be referred immediately.

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



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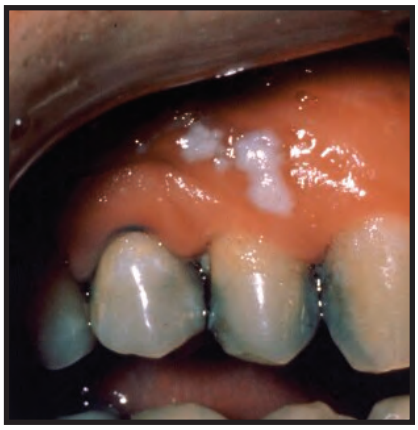
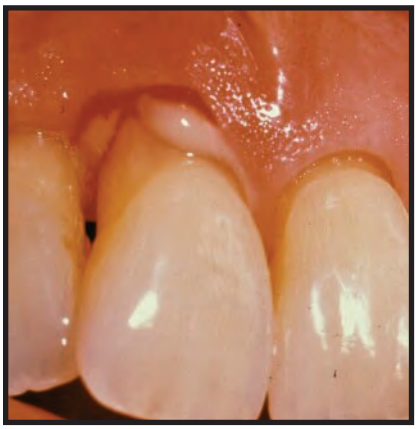
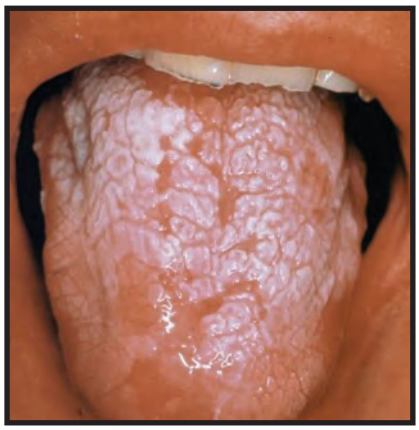


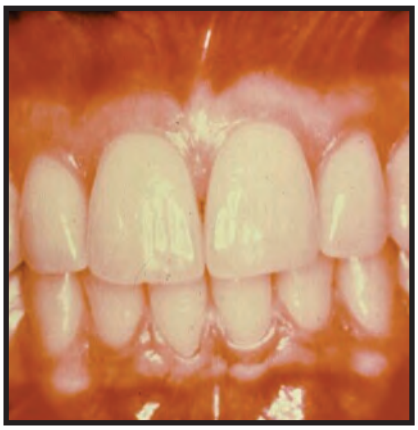
Periodontal abscess



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.

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- 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.

A person may have two or more coexisting chronic pain conditions. Such conditions can include chronic fatigue syndrome, endometriosis, fibromyalgia, inflammatory bowel disease, interstitial cystitis, temporomandibular joint dysfunction, and vulvodynia. It is not known whether these disorders share a common cause.

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.
- People with certain rheumatic diseases, such as rheumatoid arthritis, systemic lupus erythematosus (commonly called lupus), or ankylosing spondylitis (spinal arthritis) may be more likely to have fibromyalgia, too.
- Several studies indicate that women who have a family member with fibromyalgia are more likely to have fibromyalgia themselves, but the exact reason for this—whether it be heredity, shared environmental factors, or both—is unknown. One current study supported by the National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS) is trying to determine whether variations in certain genes cause some people to be more sensitive to stimuli, which leads to pain syndromes.

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.
- 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.

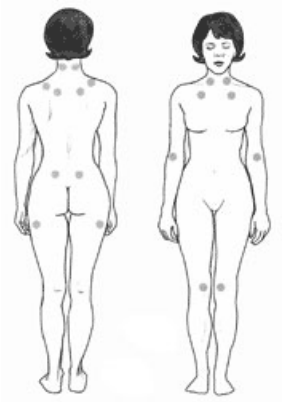
Some scientists speculate that a person's genes may regulate the way his or her body processes painful stimuli. According to this theory, people with fibromyalgia may have a gene or genes that cause them to react strongly to stimuli that most people would not perceive as painful. There have already been several genes identified that occur more commonly in fibromyalgia patients, and NIAMS-supported researchers are currently looking at other possibilities.

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 the presence of diffuse tenderness.
    - 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. Studies include:
    - o
    - o An investigation into the relationship between variations in a gene called ADRA1A and risk factors for chronic pain conditions.
    - o The establishment of a tissue bank of brain and spinal cord tissue to study fibromyalgia and to determine the extent to which chronic pain in fibromyalgia patients is associated with the activation of cells in the nervous system and the production of chemical messengers, called cytokines, that promote inflammation.
    - o The use of imaging methods to evaluate the status of central nervous system responses in patients diagnosed with fibromyalgia compared with those diagnosed with another chronic pain disorder and pain-free controls.
    - o An investigation to understand how the activation of immune cells from peripheral and central nervous system sources trigger a cascade of events leading to the activation of nerve cells, chronic pain, and the dysregulation of the effects of analgesic drugs against pain.

- An intensive evaluation of twins in which one of the pair has chronic widespread pain and the other does not, along with twins in which neither of the pair has chronic pain, to help researchers assess physiological similarities and differences in those with and without chronic pain and whether those differences are caused by genetics or environment.
- A study examining the use of cognitive behavioral therapy in pain patients, which researchers hope will advance their knowledge of the role of psychological factors in chronic pain as well as a new treatment option for fibromyalgia.
- The Patient-Reported Outcomes Measurement Information System (PROMIS) initiative. The PROMIS initiative is researching and developing new ways to measure patient-reported outcomes (PROs), such as pain, fatigue, physical functioning, emotional distress, and social role participation that have a major impact on quality-of-life across a variety of chronic diseases. The goal of this initiative is to improve the reporting and quantification of changes in PROs. NIAMS supports an effort to develop PROMIS specifically for use in patients with fibromyalgia.

- **Improving Symptoms.** A better understanding of fibromyalgia and the mechanisms involved in chronic pain are enabling researchers to find effective treatments for it. Some of the most promising lines of research in this area include the following:

  - **Increasing exercise.** Although fibromyalgia is often associated with fatigue that makes exercise difficult, regular exercise has been shown to be one of the most beneficial treatments for the condition. A new NIAMS-supported study is trying to determine whether increasing lifestyle physical activity (that is, adding more exercise such as walking up stairs instead of taking the elevator) throughout the day produces similar benefits to exercise for fibromyalgia, improving symptoms such as pain, fatigue, and tenderness. The study is also examining the potential mechanisms by which lifestyle physical activity might influence symptoms. Other research supported by NIAMS is examining the effectiveness of a 16-week program of a simplified form of Tai Chi on pain and other measures such as sleep quality, fatigue, anxiety, and depression.

    NIAMS-supported research is also examining ways to help people maintain helpful exercise programs. Because many people with fibromyalgia associate increased exercise with increased pain, doctors and therapists often have a difficult time getting patients to stick with their exercise program. The new research is examining patients' fears that cause them to avoid exercise as well as behavioral therapies to reduce fears and help them maintain exercise.

  - **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 sleep-disordered breathing—a group of disorders, the most common of which is the obstructive sleep apnea, characterized by pauses in breathing during sleep. These researchers are studying whether continuous positive airway pressure (CPAP, a therapy administered by a machine that increases air pressure in the throat to hold it open during sleep) might improve the symptoms of fibromyalgia.

    Other groups of researchers are examining the link between sleep disturbance and chronic pain in fibromyalgia and are studying whether behavioral therapy for insomnia might improve fibromyalgia symptoms.

  - **Studying new treatments.** In addition to exercise and improving sleep, NIAMS-supported researchers are looking at different ways to reduce pain and other symptoms of fibromyalgia. Potential therapies under study include transcranial magnetic stimulation (TMS) and vagus nerve stimulation.

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.

Adapted (10/2012) from: NIH Publication NO. 04-5326, July 2011 Musculoskeletal and Skin Diseases (NIAMS), a part of the Department of Health and Human Services' National Institutes of Health (NIH) Website at www.niams.nih.gov .

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

13: Joint Replacement (Knee/Hip)

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Knee Replacement Implants

Your doctor may recommend knee replacement surgery if you have severe knee pain and disability from rheumatoid arthritis, osteoarthritis, or traumatic injury. A knee replacement can relieve pain and help you live a fuller, more active life.

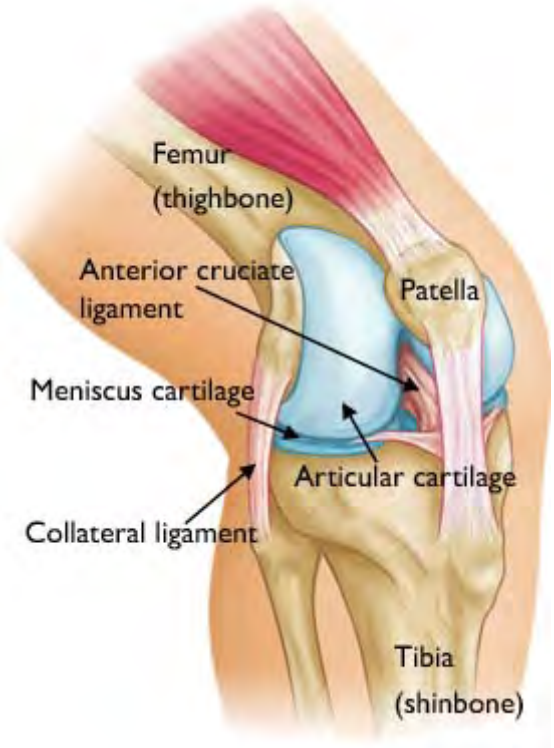
During the surgery, an orthopaedic surgeon will replace your damaged knee with an artificial device (implant). Although replacing the total knee joint is the most common procedure, some people can benefit from just a partial knee replacement.

Implants are made of metal alloys, ceramic material, or strong plastic parts, and can be joined to your bone by acrylic cement. There are many different types of implants. Your surgeon will discuss with you the type of implant that best meets your needs.

Implant Design

Normal Knee Function

Your knee is the largest and strongest joint in your body. The knee joint is where the lower end of your femur (thighbone) meets the upper end of your tibia (shinbone). Your patella (kneecap) sits in front of the joint to provide some protection.



A healthy knee lets you move your lower leg forward and backward, and swivel slightly to point your toes in or out. Ligaments and cartilage stabilize and support the joint, preventing your knee from moving too far from side to side.

Types of Designs

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 bone surfaces actually roll and glide as the knee bends.

The first implant designs used the hinge concept and included a connecting hinge between the parts. Newer implant designs recognize the complexity of the joint and more closely mimic the motion of a normal knee. Some designs preserve the patient's own ligaments, while others substitute for them.

Several manufacturers make knee implants and there are more than 150 knee replacement designs on the market today.

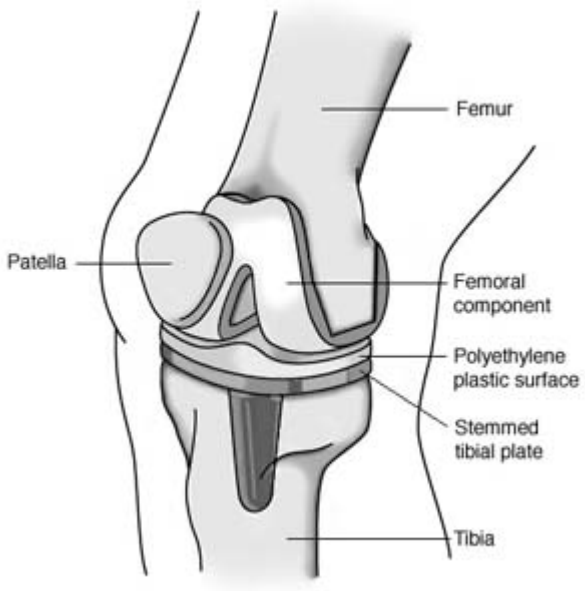
Recent developments in design include "gender specific" implants. A number of studies indicate that the shape and proportions of a woman's knee differ from those of a man's knee. As a result, several manufacturers have developed components for the end of the thighbone which more closely match the average woman's knee. However, there are no studies to show that "gender specific" implants last longer or provide better function than standard implants.

The Right Implant for You

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), your doctor's experience and familiarity with the device, and the cost and performance record of the implant. You should discuss these issues with your doctor.

Implant Components

Knee implant components



Up to three bone surfaces may be replaced in a total knee replacement:

- **The lower ends of the femur.** The metal femoral component curves around the end of the femur (thighbone). It is grooved so the kneecap can move up and down smoothly against the bone as the knee bends and straightens.
- **The top surface of the tibia.** The tibial component is typically a flat metal platform with a cushion of strong, durable plastic, called polyethylene. Some designs do not have the metal portion and attach the polyethylene directly to the bone. For additional stability, the metal portion of the component may have a stem that inserts into the center of the tibia bone.
- **The back surface of the patella.** The patellar component is a dome-shaped piece of polyethylene that duplicates the shape of the patella (kneecap).

Components are designed so that metal always adjoins with plastic, which provides smooth movement and results in minimal wear.

Posterior-Stabilized Designs

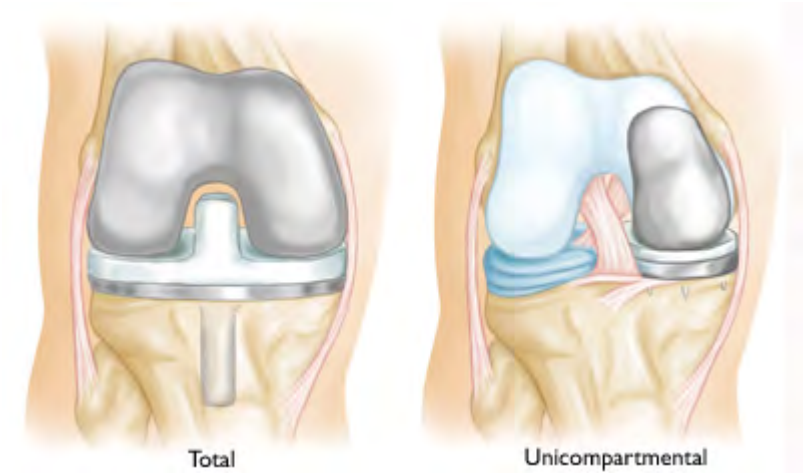
In these designs, the cushion of the tibial component has a raised surface with an internal post that fits into a special bar (called a cam) in the femoral component. The posterior cruciate ligament is removed to fit the components to the bone. The pieces work together to do what the posterior cruciate ligament does: prevent the thighbone from sliding forward too far on the shinbone when you bend your knee.

Cruciate-Retaining Designs

As the name implies, the posterior cruciate ligament is kept with this implant design. Cruciate-retaining implants do not have the center post and cam design. This implant may be appropriate for a patient whose posterior cruciate ligament is healthy enough to continue stabilizing the knee joint.

Unicompartmental Implants

In total knee replacement, large implants are used to resurface the ends of the femur and tibia. If only one side of the knee joint is damaged, smaller implants can be used (unicompartmental knee replacement) to resurface just that side.



In a unicompartmental (partial) knee replacement, only the damaged part of the knee is replaced.

Fixed- vs. Mobile-Bearing Prosthesis (Implant)

Fixed-Bearing Prosthesis

Most patients get a fixed-bearing prosthesis. In this design, the polyethylene of the tibial component is attached firmly to the metal implant beneath. The femoral component then rolls on this cushioned surface.

In some cases, excessive activity and/or extra weight can cause a fixed-bearing prosthesis to wear down more quickly. Worn components can loosen from the bone and cause pain. Loosening is a major reason some artificial joints fail.

If you are younger, more active, and/or overweight, your doctor may recommend a rotating platform/mobile-bearing knee replacement. These implants are designed for potentially longer performance with less wear.

Mobile-Bearing Prosthesis

Like fixed-bearing implants, mobile-bearing implants use three components to provide a relatively natural joint. In a mobile-bearing knee, however, the polyethylene insert can rotate short distances inside the metal tibial tray.

This is designed to allow patients a few degrees of greater rotation to the medial and lateral sides of their knee.

Compared with fixed-bearing designs, mobile-bearing knee implants require more support from soft tissues, such as the ligaments surrounding the knee. If the soft tissues are not strong enough, mobile-bearing knees are more likely to dislocate. They also may cost more than fixed-bearing implants.

In addition, there are no studies which show better durability, improvement in pain, or improvement of function with a mobile bearing design.

Implant Materials

The metal parts of the implant are made of titanium or cobalt-chromium based alloys. The plastic parts are made of ultra high molecular weight polyethylene. All together, the components weigh between 15 and 20 ounces, depending on the size selected.

Material Criteria

The construction materials used must meet several criteria:

- They must be biocompatible; that is, they can be placed in the body without creating a rejection response.
- They must be able to duplicate the knee structures they are intended to replace; for example, they are strong enough to take weight bearing 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.

Cemented and Cementless Implants

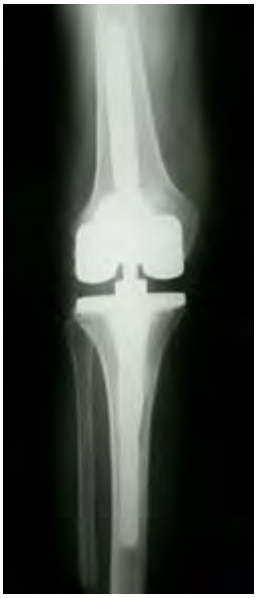
Two types of fixation are used to hold knee implants in place. Cemented fixation uses a fast-curing bone cement (polymethylmethacrylate). Cementless fixation relies on new bone growing into the surface of the implant for fixation.

Cementless implants are made of a material that attracts new bone growth. Most are textured or coated so that the new bone actually grows into the surface of the implant.

There is also hybrid fixation. In hybrid fixation for total knee replacement, the femoral component is inserted without cement, and the tibial and patellar components are inserted with cement.

Your surgeon will evaluate your situation carefully before making any decisions about components and fixation. Do not hesitate to ask what type of fixation will be used in your situation and why that choice is appropriate for you.

Revision Components



Revision components usually have longer stems that insert into the bones. The longevity and performance of a knee replacement depends on several factors, including your activity level, weight, and general health.

Just as wear in the natural joint contributed to the need for a replacement, wear in the implant may eventually require a second surgery (called a joint revision).

Revision surgery may require special components. Typically they will have longer stems which fit into the femur and tibia. They may also have attached metal pieces called augments which substitute for missing bone.

Revision components often have a cam in the center of the knee similar to a posterior stabilized component. In revision components, though, the cam is larger to give the knee more stability.

In cases where the knee is very unstable and a large amount of bone is missing, it may be necessary to join the femur and tibia with a metal "hinge" in the center.

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http://orthoinfo.aaos.org/topic.cfm?topic=A00221

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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

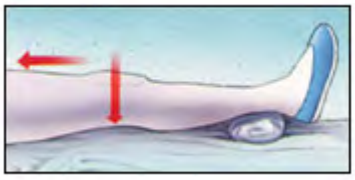
Start the following exercises as soon as you are able. You can begin these in the recovery room shortly after surgery. You may feel uncomfortable at first, but these exercises will speed your recovery and actually diminish your post-operative pain.

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.

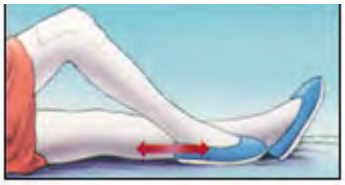
Straight Leg Raises - Tighten the thigh muscle with your knee fully straightened on the bed, as with the Quad set. Lift your leg several inches. Hold for five to 10 seconds. Slowly lower. Repeat until your thigh feels fatigued.
You also can do leg raises while sitting. Fully tighten your thigh muscle 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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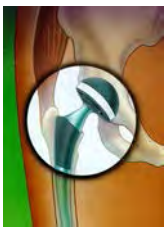
Total Hip Replacement

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.



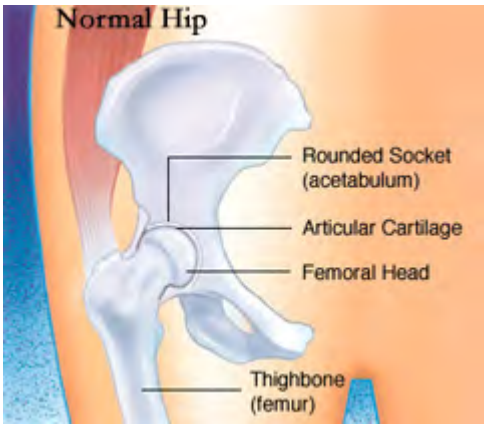
How the Normal Hip Works

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.

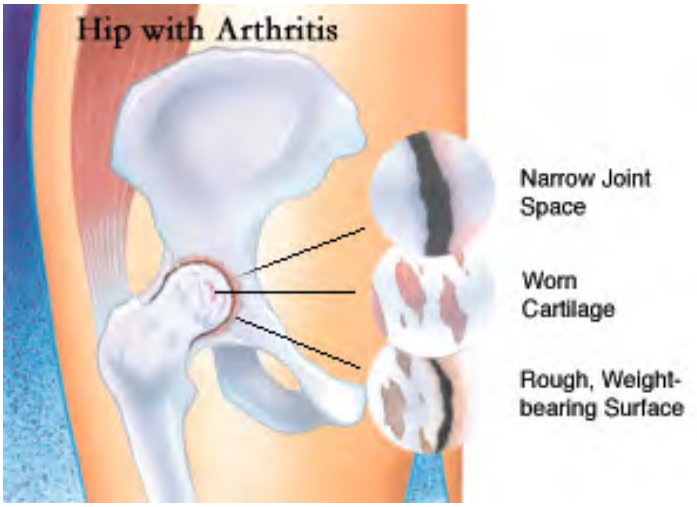
Normally, all of these parts of your hip work in harmony, allowing you to move easily and without pain.



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.

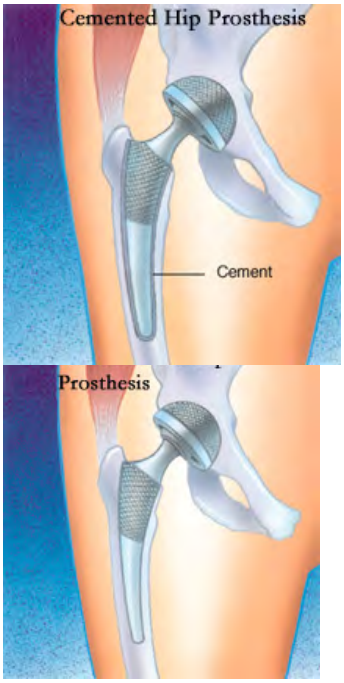
- Securely fastened safety bars or handrails in your shower or bath
- Secure handrails along all stairways
- A stable chair for your early recovery with a firm seat cushion that allows your knees to remain lower than your hips, a firm back and two arms
- A raised toilet seat
- A stable shower bench or 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.

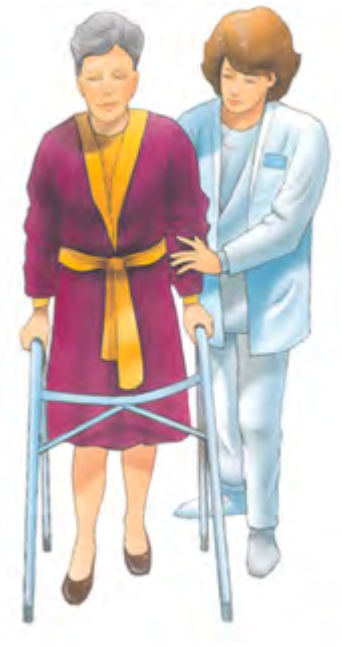
Your Stay in the Hospital
You will usually stay in the hospital for a few days. After surgery, you will feel pain in your hip. Pain medication will be given to make you as comfortable as possible.

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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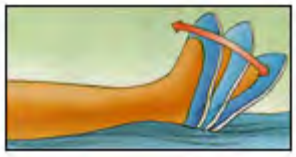
This page's address: http://orthoinfo.aaos.org/fact/thr_report.cfm&topcategory=Hip&Thread_ID=274

Total Hip Replacement Exercise Guide

Regular exercises to restore your normal hip motion 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 20 to 30 minutes 2 or 3 times a day during your early recovery. They may suggest some of the following exercises. This can help you better understand your exercise and activity program.

Early Postoperative Exercises

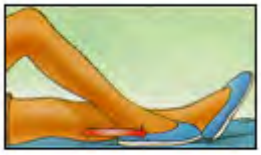
These exercises are important for increasing circulation to your legs and feet to prevent blood clots. They also are important to strengthen muscles and to improve your hip movement. You may begin these exercises in the recovery room shortly after surgery. It may feel uncomfortable at first but these exercises will speed your recovery and reduce your postoperative pain. These exercises should be done as you lie on your back with your legs spread slightly apart.



Ankle Pumps - Slowly push your foot up and down. Do this exercise several times as often as every 5 or 10 Minutes. This exercise can begin immediately after surgery and continue until you are fully recovered.

Ankle Rotations - Move your ankle inward toward your other foot and then outward away from your other foot. Repeat 5 times in each direction 3 or 4times a day.

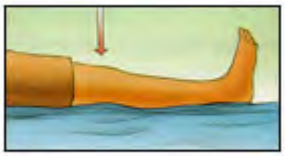
Repeat the following three exercises 10 times 3 or 4 times a day



Bed-Supported Knee Bends - Slide your heel toward your buttocks, bending your knee and keeping your heel on the bed. Do not let your knee roll inward.

Buttock Contractions - Tighten buttock muscles and hold to a count of 5.

Abduction Exercise - Slide your leg out to the side as far as you can and then back.



Quad Set - Tighten your thigh muscle. Try to straighten your knee. Hold for 5 to 10 seconds. Repeat this exercise 10 times during a 10-minute period. Continue until your thigh feels fatigued.

Straight Leg Raises - Tighten your thigh muscle with your knee fully straightened on the bed. As your thigh muscle tightens, lift your leg several inches off the bed. Hold for 5 to 10 seconds. Slowly lower. Repeat until your thigh feels fatigued.

Standing Exercises - Soon after your surgery, you will be out of bed and able to stand. You will require help since you may become dizzy the first several times you stand. As you regain your strength, you will be able to stand independently. While doing these standing exercises, make sure you are holding on to a firm surface such as a bar attached to your bed or a wall.

Repeat the following exercises 10 times 3 or 4 times a day

Standing Knee Raises - Lift your operated leg toward your chest. Do not lift your knee higher than your waist. Hold for 2 or 3 counts and put your leg down.

Standing Hip Abduction - Be sure your hip, knee and foot are pointing straight forward. Keep your body straight. With your knee straight, lift your leg out to the side. Slowly lower your leg so your foot is back on the floor.

Standing Hip Extensions - Lift your operated leg backward slowly. Try to keep your back straight. Hold for 2 or 3 counts. Return your foot to the floor.

Walking and Early Activity

Soon after surgery, you will begin to walk short distances in your hospital room and perform light everyday activities. This early activity helps your recovery by helping your hip muscles regain strength and movement.

Walking with Walker - Full Weight Bearing - Stand comfortably and erect with your weight evenly balanced on your walker or crutches. Move your walker or crutches forward a short distance. Then move forward, lifting your operated leg so that the heel of your foot will touch the floor first. As you move, your knee and ankle will bend and your entire foot will rest evenly on the floor. As you complete the step allow your toe to lift off the floor. Move the walker again and your knee and hip will again reach forward for your next step. Remember, touch your heel first, then flatten your foot, then lift your toes off the floor. Try to walk as smoothly as you can. Don't hurry. As your muscle strength and endurance improve, you may spend more time walking. Gradually, you will put more and more weight on your leg.

Walking with Cane or Crutch - A walker is often used for the first several weeks to help your balance and to avoid falls. A cane or a crutch is then used for several more weeks until your full strength and balance skills have returned. Use the cane or crutch in the hand opposite the operated hip. You are ready to use a cane or single crutch when you can stand and balance without your walker, when your weight is placed fully on both feet, and when you are no longer leaning on your hands while using your walker.

Stair Climbing and Descending - The ability to go up and down stairs requires both flexibility and strength. At first, you will need a handrail for support and you will only be able to go one step at a time. Always lead up the stairs with your good leg and down the stairs with your operated leg. 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 those of the standard height Of seven inches and always use the handrail for balance.

Advanced Exercises and Activities

A full recovery will take many months. The pain from your problem hip before your surgery and the pain and swelling after surgery have weakened your hip muscles. The following exercises and activities will help your hip muscles recover fully. These exercises should be done in 10 repetitions four times a day with one end of the tubing around the ankle of your operated leg and the opposite end of the tubing attached to a stationary object such as a locked door or heavy furniture. Hold on to a chair or bar for balance.

Elastic Tube Exercises

Resistive Hip Flexion - Stand with your feet slightly apart. Bring your operated leg forward keeping the knee straight. Allow your leg to return to its previous position.

Resistive Hip Abduction -Stand sideways from the door and extend your operated leg out to the side. Allow your leg to return to its previous position.

Resistive Hip Extensions - Face the door or heavy object to which the tubing is attached and pull your leg straight back. Allow your leg to return to its previous position.

Exercycling - Exercycling is an excellent activity to help you regain muscle strength and hip mobility. Adjust the seat height so that the bottom of your foot just touches the pedal with your knee almost straight. Pedal backwards at first. Pedal forward only after comfortable cycling motion is possible backwards. As you become stronger (at about 4 to 6 weeks) slowly increase the tension on the exercycle. Exercycle forward 10 to 15 minutes twice a day, gradually building up to 20 to 30 minutes 3 to 4 times a week.

Walking - Take a cane with you until you have regained your balance skills. In the beginning, walk 5 or 10 minutes 3 or 4 times a day. As your strength and endurance improves, you can walk for 20 or 30 minutes 2 or 3 times a day. Once you have fully recovered, regular walks, 20 or 30 minutes 3 or 4 times a week, will help maintain your strength.

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Do's and Don'ts of Hip Replacement Post-op

Some of the most common precautions:

- Don't cross your legs at the knees for at least 8 weeks.
- Don't bring your knee up higher than your hip.
- Don't lean forward while sitting or as you sit down.
- Don't try to pick up something on the floor while you are sitting.
- Don't turn your feet excessively inward or outward when you bend down.
- Do keep the leg facing forward.
- Do keep the affected leg in front as you sit or stand.
- Don't reach down to pull up blankets when lying in bed.
- Don't bend at the waist beyond 90 degrees.
- Don't stand pigeon-toed.
- Do use a high kitchen or bar stool in the kitchen.
- Don't kneel on the knee on the unoperated leg (the good side).
- Do kneel on the knee on the operated leg (the bad side).
- Don't use pain as a guide for what you may or may not do.
- Do use ice to reduce pain and swelling, but remember that ice will diminish sensation. Don't apply ice directly to the skin; use an ice pack or wrap it in a damp towel.
- Do apply heat before exercising to assist with range of motion. Use a heating pad or hot, damp towel for 15 to 20 minutes.
- Do cut back on your exercises if your muscles begin to ache, but don't stop doing them!

14: Kidney Failure

Kidney Failure

Definition

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.

Characteristics

Causes of kidney failure include:

- Diabetic Nephropathy
- High Blood Pressure
- Glomerular Diseases
- Inherited and Congenital Kidney Diseases
- Poisons and trauma
- 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.

Functional Considerations

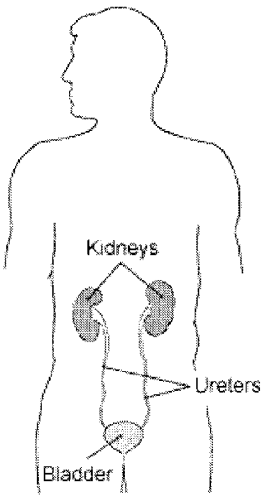
- These are primarily related to anemia, fatigue, diet, depression and other systemic issues related to treatment and disease state.
- What is the diet? There may be a basis to exceed HTGs for Meal Prep to prepare the diet.
- Does the consumer need transportation to hemodialysis center? Both ways? This 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.

NIDDK

The Kidneys and How They Work

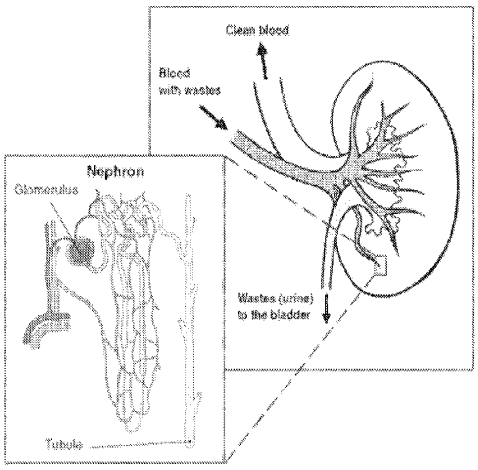
The kidneys are vital organs that perform many functions to keep blood clean and chemically balanced.

What Do the Kidneys Do?



The kidneys are bean-shaped organs, each about the size of a fist. They are located near the middle of the back, just below the rib cage. The kidneys are sophisticated reprocessing machines. Every day, the kidneys process about 200 quarts of blood to sift out about 2 quarts of waste products and extra water. The waste and extra water become urine, which flows to the bladder through tubes called ureters. The bladder stores urine until emptying.

Wastes in the blood come from the normal breakdown of active tissues and from the food. The body uses the food for energy and self-repair. After the body has taken what it needs from the food, waste is sent to the blood. If the kidneys did not remove these wastes, the wastes would build up in the blood and damage the body.



The actual filtering occurs in tiny units inside the kidneys called nephrons. Every kidney has about a million nephrons. In the nephron, a glomerulus—which is a tiny blood vessel, or capillary—intertwines with a tiny urine-collecting tube called a tubule. A complicated chemical exchange takes place, as waste materials and water leave the blood and enter the urinary system.

At first, the tubules receive a combination of waste materials and chemicals that the body can still use. The kidneys measure out chemicals like sodium, phosphorus, and potassium and release them back to the blood to return to the body. In this way, the kidneys regulate the body's level of these substances. The right balance is necessary for life, but excess levels can be harmful.

In addition to removing wastes, kidneys release three important hormones:

- **erythropoietin** (eh-RITH-ro-POY-eh-tin), or EPO, which stimulates the bone marrow to make red blood cells
- **renin** (REE-nin), which regulates blood pressure
- **calcitriol** (kal-suh-TRY-ul), the active form of vitamin D, which helps maintain calcium for bones and for normal chemical balance in the body

What is Renal Function?

With two healthy kidneys, there is 100 percent of renal function. This is more renal function than is really needed. Some people are born with only one kidney, and these people are able to lead normal, healthy lives. Many people donate a kidney for transplantation to a family member or friend. Small declines in renal function may not cause a problem.

But many people with reduced renal function have a kidney disease that will get worse. Serious health problems occur if there is less than 25 percent of normal renal function. If renal function drops below 10 to 15 percent, a person cannot live long without some form of renal replacement therapy—either dialysis or transplantation.

Why Do Kidneys Fail?

Most kidney diseases attack the nephrons, causing them to lose their filtering capacity. Damage to the nephrons may happen quickly, often as the result of injury or poisoning. But most kidney diseases destroy the nephrons slowly and silently. Only after years or even decades will the damage become apparent. Most kidney diseases attack both kidneys simultaneously.

The two most common causes of kidney disease:

- **Diabetic Nephropathy**
- **High Blood Pressure**
- **Glomerular Diseases** - include autoimmune diseases, infection-related diseases, and sclerotic diseases which attack the tiny blood vessels (glomeruli) within the kidney.
- **Inherited and Congenital Kidney Diseases** – include Polycystic kidney disease (PKD)

Other causes of kidney disease:

- Poisons and trauma, for example a direct and forceful blow to the kidneys, can lead to kidney disease.
- Over-the-counter medicines can be poisonous to the kidneys if taken regularly over a long period of time. Products that combine aspirin, acetaminophen, and other medicines such as ibuprofen have been found to be the most dangerous to the kidneys.

How Do Kidneys Fail?

Many factors that influence the speed of kidney failure are not completely understood. Researchers are still studying how protein in the diet and cholesterol levels in the blood affect kidney function.

Acute Renal Failure (ARF)

- Sudden drops in kidney function are called acute renal failure.
- Often due to poisons, drugs or trauma.
- May lead to permanent loss of kidney function.

If the kidneys are not seriously damaged, acute renal failure may be reversed.

Chronic Kidney Disease (CKD)

- Most kidney problems - happens slowly.
- People may have "silent" kidney disease for years. Is a gradual loss of kidney function.
- May go on to permanent kidney failure.
- Have a high risk of dying from a stroke or heart attack.

End-Stage Renal Disease

Total or nearly total and permanent kidney failure is called end-stage renal disease (ESRD). People with ESRD must undergo dialysis or transplantation to stay alive.

What are the Signs of Kidney Disease?

People in the early stages of kidney disease usually do not feel sick at all.

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.

NIDDK

What Medical Tests are Used to Detect Kidney Disease?

Since someone can have kidney disease without any symptoms, the doctor may first detect the condition through routine blood and urine tests. The National Kidney Foundation recommends simple tests to screen for kidney disease:

- A blood pressure measurement,
- A spot check for protein or albumin in the urine (proteinuria),
- A calculation of glomerular filtration rate (GFR) based on a serum creatinine measurement, and
- Measuring urea nitrogen in the blood provides additional information.

Additional Tests for Kidney Disease

If blood and urine tests indicate reduced kidney function, a doctor may recommend additional tests to help identify the cause of the problem.

Renal imaging:

- ultrasound,
- computed tomography (CT scan), and
- magnetic resonance imaging (MRI).

These tools are most helpful in finding unusual growths or blockages to the flow of urine.

Renal biopsy:

Done for direct examination or tissue sample.

What are the Stages of Kidney Disease?

GFR is the best indicator of how well the kidneys are working.

Five Stages of Kidney Chronic Kidney Failure

(National Kidney Foundation 2002)

Increased risk of CKD	A GFR of 90 or above is considered normal.	▪ Diabetes, high blood pressure, or a family history of kidney disease. ↑ risk ▪ ↑ risk with age: over 65 2x as likely to develop CKD as people between the ages of 45 and 65 ▪ African Americans also have a higher risk of developing CKD
Stage 1	Kidney damage with normal GFR (90 or above)	▪ Kidney damage may be detected before the GFR begins to decline ▪ Goals of treatment are to slow the progression of CKD and reduce the risk of heart and blood vessel disease.
Stage 2	Kidney damage with mild decrease in GFR (60 to 89)	▪ Continue treatment to reduce the risk of other health problems.
Stage 3	Moderate decrease in GFR (30 to 59)	▪ Anemia and bone problems become more common.
Stage 4	Severe reduction in GFR (15 to 29)	▪ Patient may need hemodialysis, peritoneal dialysis or consider transplantation
Stage 5	Kidney failure (GFR less than 15)	▪ Dialysis or a kidney transplant is needed.

NIDDK

What Can be Done about Kidney Disease?

Chronic kidney disease often cannot be cured. In the early stages of a kidney disease, a person may be able to make their kidneys last longer by taking certain steps:

Blood Glucose	• Keep in close control
Blood Pressure	• Keep blood pressure below 130/80 • Diuretic plus antihypertensive medication may be needed
Diet • Protein • Cholesterol • Sodium • Potassium	• Low protein diet - impaired kidneys may fail to separate the protein from the wastes • Low fat and low cholesterol to prevent heart disease • Low sodium to decrease chance of high blood pressure • Diseased kidneys may fail to remove excess potassium, and with very poor kidney function, high potassium levels can affect the heart rhythm
Pain medications	• Consult with MD before taking – may further damage kidney
Smoking	• Increases risk of kidney disease
Anemia	• Injections of a man-made form of EPO may be required (diseased kidneys may not make enough EPO).

What Happens if the Kidneys Fail Completely?

1. Complete and irreversible kidney failure is sometimes called **end-stage renal disease, or ESRD**.
2. 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**.

Symptoms of Kidney Failure

Kidney failure can hit in surprising ways. Symptoms of kidney failure are as a result of the build – up of waste products in the blood (uremic toxins) and lack of hormones normally produced in the kidneys.

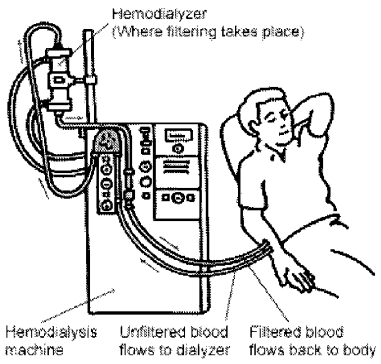
Symptom	*Description*	*Treatments in addition to dialysis*
Anemia and Fatigue	▪ due to decreased red blood cells resulting in decrease in oxygen to the tissues and low production of EPO due to kidney insufficiencies.	▪ EPO injections may be given
Loss of Appetite and Nausea	▪ uremia can change the way food tastes.	
Itching (Pruritus)	▪ often worse during or just after the dialysis treatment ▪ caused by uremic toxins that aren't removed from the blood during dialysis ▪ or may be caused by high levels of parathyroid hormone (PTH)	▪ General cure not found. Possible treatments: o removing parathyroid glands o oral phosphate binders o ultraviolet light o EPO shots o Antihistamines (Benadryl, Atarax, Vistaril) o Capsaicin cream o Lanolin or camphor creams

Sleep Disorders	▪ **insomnia** (trouble getting to sleep ▪ **sleep apnea** syndrome - breaks in breathing during sleep ▪ "day-night reversal" (insomnia at night, sleepiness during the day) ▪ **"restless" legs** - aching, uncomfortable, jittery, feelings in legs, often kick or thrash their legs during sleep.	▪ Apnea treatments: o losing weight, o changing sleeping position, and o wearing a mask that gently pumps air continuously into the nose (nasal continuous positive airway pressure, or CPAP) ▪ Restless legs treatments: o Moderate exercise during the day o Avoid exercise before going to bed o Avoid or reduce caffeine, alcohol, and tobacco o massages or warm baths o benzodiazepines may help such as Klonopin, Librium, Valium, and Halcion o levodopa (Sinemet) – also used to treat Parkinson's
Renal Osteodystrophy	▪ bone disease of kidney failure ▪ affects 90 percent of dialysis patients ▪ bones to become thin, weak, or malformed ▪ Older patients and women who have gone through menopause are at greater risk	
Amyloidosis(DRA)	▪ common in people who have been on dialysis for more than 5 years ▪ causes pain, stiffness, and fluid in the joints, as is the case with arthritis	
Depression	▪ time spent on dialysis ▪ have less energy ▪ changes in work or home life ▪ giving up some activities and responsibilities ▪ Accepting new reality	▪ Make sure treatments are attending to the life impacts of ESRD ▪ A counselor or social worker can help with coping

Treatment Choice: Dialysis

The two major forms of dialysis are hemodialysis and peritoneal dialysis.

In **hemodialysis,** the blood is sent through special filter called a dialyzer that functions as an artificial kidney to clean the blood. The blood travels through tubes into the dialyzer, which filters out wastes and extra water. The clean blood is returned to the body. Hemodialysis is usually performed at a dialysis center three times per week for 3 to 4 hours. During treatment, the patient can read, write, sleep, talk, or watch TV.



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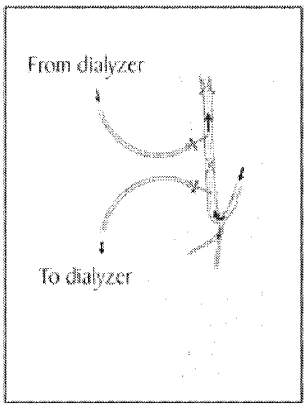
Vascular Access for Hemodialysis

This access provides an efficient way for blood to be carried from the body to the dialyzer and back without causing discomfort. The two main types of access are a fistula and a graft.

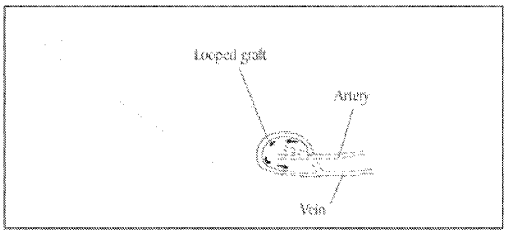


Fistula

- using the patient's own blood vessels;
- an artery is connected directly to a vein,
- usually in the forearm.
- the increased blood flow makes the vein grow larger and stronger so that it can be used for repeated needle insertions.
- is the preferred type of access
- It may take several weeks to be ready for use

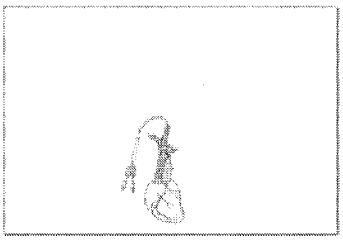
Graft

- connects an artery to a vein by using a synthetic tube.
- doesn't need to develop as a fistula does, so it can be used sooner after placement.
- is more likely to have problems with infection and clotting.



Catheter

- for quickly progressing kidney failure.
- not time to place a permanent vascular access –usually temporary access
- the catheter is a tube inserted into a vein in the neck, chest, or leg near the groin
- some people use a catheter for long-term access as well
- Catheters that will be needed for more than about 3 weeks are placed under the skin to increase comfort and reduce complications



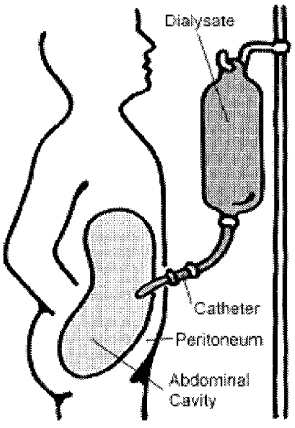
Possible Complications of Hemodialysis

- **Vascular access problems** are the most common reason for hospitalization among people on hemodialysis.
  - infection,
  - blockage from clotting, and
  - poor blood flow. These problems can keep treatments from working.

A patient may need to undergo repeated surgeries in order to get a properly functioning access.

- **Other problems** can be caused by rapid changes in the body's water and chemical balance during treatment.
  - Muscle cramps and
  - hypotension—a sudden drop in blood pressure— can make patients feel weak, dizzy, or nauseated.

People usually need a few months to adjust to hemodialysis. Side effects can often be treated quickly and easily, so they should always be reported to the doctor and dialysis staff. Many side effects can be avoided by following a proper diet, limiting liquid intake, and taking medicines as directed.



Peritoneal dialysis uses the lining of the abdomen, or belly, to filter the blood. This lining is called the peritoneal membrane and acts as the artificial kidney.

A mixture of minerals and sugar dissolved in water, called dialysis solution, travels through a soft tube into the belly. The sugar—called dextrose—draws wastes, chemicals, and extra water from the tiny blood vessels in the peritoneal membrane into the dialysis solution. After several hours, the used solution is drained from the abdomen through the tube, taking the wastes from the blood with it. Then the abdomen is filled with fresh dialysis solution, and the cycle is repeated. The process of draining and refilling is called an exchange.

Vascular Access for Peritoneal Dialysis

- soft tube catheter surgically placed into the abdomen
- usually from 10 days to 2 or 3 weeks—for the insertion site to heal
- best to use after adequate healing
- is permanent

Types of Peritoneal Dialysis

Three types of peritoneal dialysis are available. All are performed by the patient, usually without need of another to help.

Continuous Ambulatory Peritoneal Dialysis (CAPD)	▪ CAPD requires no machine and can be done in any clean, well-lit place ▪ blood is always being cleaned ▪ dialysis solution stays in the abdomen for a dwell time of 4 to 6 hours, or more ▪ process of draining the used dialysis solution and replacing it with fresh solution takes about 30 to 40 minutes ▪ change the dialysis solution at least four times a day ▪ most people and sleep with solution in their abdomens at night ▪ not necessary to wake up and perform dialysis tasks during the night
Continuous Cycler-Assisted Peritoneal Dialysis (CCPD)	▪ uses a machine called a cycler to fill and empty the abdomen three to five times during the night during sleep ▪ in the morning, begin one exchange occurs with a dwell time that lasts the entire day ▪ additional exchange may be done in the middle of the afternoon without the cycler to increase the amount of waste removed and to reduce the amount of fluid left behind in the body
Combination of CAPD and CCPD	▪ if the patient weighs more than 175 pounds ▪ if the peritoneum filters wastes slowly

Possible Complications of Peritoneal Dialysis

- **peritonitis**, a serious abdominal infection.
  - can occur if the opening where the catheter enters the body becomes infected or if contamination occurs as the catheter is connected or disconnected from the bags.
  - Peritonitis requires antibiotic treatment by the doctor
  - To avoid peritonitis,
    - procedures must be followed exactly with clean technique
  - early signs of peritonitis –report to MD immediately
    - fever,
    - unusual color or cloudiness of used fluid
    - redness or pain around the catheter.

Dialysis is Not a Cure

Hemodialysis and peritoneal dialysis are **treatments** that help replace the work the kidneys did. These treatments help the patient feel better and live longer, but they don't cure kidney failure.

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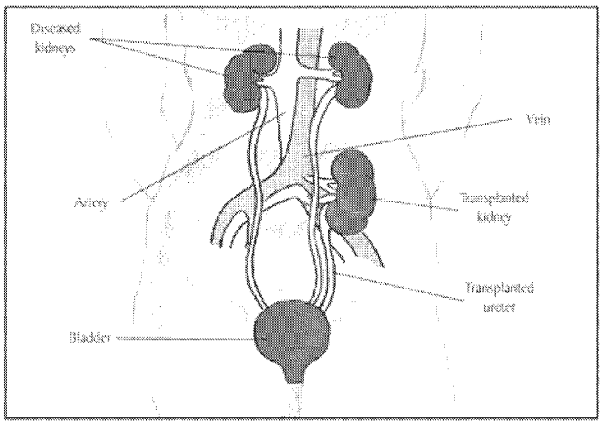
Treatment Choice: Kidney Transplantation

Kidney transplantation surgically places a healthy kidney from another person into the body. The donated kidney does the work that the two failed kidneys used to do. The new kidney may start working right away or may take up to a few weeks to make urine. Unless the patient's own kidneys are causing infection or high blood pressure, they are left in place.



A donated kidney may come from an anonymous donor who has recently died or from a living person, usually a relative. The wait for a deceased donor kidney can be several years.

The kidney that is received must be a good match. The transplant team considers three factors in matching kidneys with potential recipients. These factors help predict whether the body's immune system will accept the new kidney or reject it.

- **Blood type.** Blood type (A, B, AB, or O) must be compatible with the donor's. Blood type is the most important matching factor.
- **Human leukocyte antigens (HLAs).** The cells carry six important HLAs, three inherited from each parent. Family members are most likely to have a complete match. The patient may still receive a kidney if the HLAs aren't a complete match as long as their blood type matches the organ donor's and other tests are negative.
- **Cross-matching antigens**. The last test before implanting an organ is the cross-match. A small sample of the patient's blood will be mixed with a sample of the organ donor's blood in a tube to see if there's a reaction. If no reaction occurs, the result is called a negative cross-match, and the transplant operation can proceed.

The more the new kidney is like the recipient, the less likely their immune system is to reject it. Between 85 and 90 percent of transplants from deceased donors are working 1 year after surgery. Transplants from living relatives often work better than transplants from deceased donors because they're usually a closer match.

The surgery takes 3 to 4 hours. The usual hospital stay is about a week. After the patient leaves the hospital, they will have regular follow-up visits.

The donor will probably stay in the hospital about the same amount of time – about a week. However, a new technique for removing a kidney for donation uses a smaller incision and may make it possible for the donor to leave the hospital in 2 to 3 days.

Possible Complications of Transplantation

- **Rejection** – Transplantation is the closest thing to a cure. But no matter how good the match, the body may reject the new kidney.
  - A common cause of rejection is not taking medication as prescribed.
  - immunosuppressants to help prevent the body's immune system from attacking (rejecting) the kidney
  - need to take immunosuppressants every day for as long as the transplanted kidney is functioning
  - sometimes, even if take correctly, the drugs can't stop the body from rejecting the new kidney
  - If rejection occurs – will restart dialysis and possibly wait for another transplant.

- **Immunosuppressant side effects** – In some patients:
  - facial fullness
  - weight gain
  - development of acne or facial hair
  - ↑ risk of developing cancer –due to diminished immune system
  - cataracts
  - diabetes
  - extra stomach acid
  - high blood pressure
  - bone disease

Treatment Choice: Refusing or Withdrawing from Treatment

For many people, dialysis and transplantation not only extend life but also improve quality of life. For others who have serious ailments in addition to kidney failure, dialysis may seem a burden that only prolongs suffering. Patients have the right to refuse or withdraw from dialysis if they feel they have no hope of leading a life with dignity and meaning. This decision should be made in conjunction with the spouse, family, religious counselor, or social worker.

With withdraw from dialysis treatments or refusal to begin them, the patient may live for a few days or for several weeks, depending on the health and the remaining kidney function. The doctor can provide medicines to make the patient more comfortable during this time. Patients my change their mind about refusing dialysis, and may start or resume the treatments at any time.

Even if the patient is satisfied with the quality of life on dialysis, they should think about circumstances that might make them want to stop dialysis treatments. At some point in a medical crisis, they might lose the ability to express the wishes to the doctor. An advance directive is a statement or document in which gives instructions either to withhold treatment or to provide it, depending on the wishes and the specific circumstances.

Paying for Treatment

Treatment for kidney failure is expensive, but Federal health insurance plans pay much of the cost, usually up to 80 percent. Often, private insurance or state programs pay the rest.

Adapted from the following NIH Publications: No. 06–4241 (November 2005); No. 06–6059 (July 2006); No. 07–2412 (March 2007) National Kidney and Urologic Diseases Information Clearinghouse, 3 Information Way Bethesda, MD 20892–3580 www. niddk.nih.gov

Diet and Dialysis

Once the kidneys have stopped working, hemodialysis removes wastes from the blood. Between dialysis sessions, wastes can build up in the blood and cause problems. The amount of wastes can be reduced by monitoring what the patient eats and drinks. A good meal plan can improve dialysis and health.

What about Fluids?

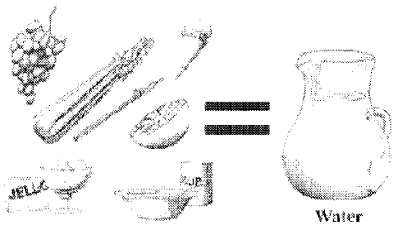
The hemodialysis patient must watch how much fluids they drink daily. Any food that is liquid at room temperature also contains water. These foods include soup, Jell-O, and ice cream. Many fruits and vegetables contain lots of water, too. They include melons, grapes, apples, oranges, tomatoes, lettuce, and celery. All these foods add to fluid intake.

Fluid can build up between dialysis sessions, causing swelling and weight gain. The extra fluid affects blood pressure and can make the heart work harder. Serious heart trouble can result from overloading the system with fluid.

Control Thirst
The best way to reduce fluid intake is to reduce thirst caused by the salt intake. Avoid salty foods like chips and pretzels. Choose low-sodium products.

Keep fluids down by drinking from smaller cups or glasses. Freeze juice in an ice cube tray and eat it like a popsicle.

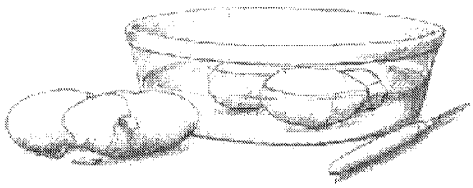
"Dry weight" is the weight after a dialysis session when all of the extra fluid in has been removed. If too much fluid builds up between sessions, it is harder to get down to a proper dry weight. The patient's dry weight may change over a period of 3 to 6 weeks. The each patient has a different goal dry weight determined by the doctor.



Even on hemodialysis, the kidneys may still be able to remove some fluid. It is also likely the kidneys may not remove any fluid at all. This is why every patient has a different daily allowance for fluid. Each patient should be aware of that allowance.

What about Potassium?
Potassium is a mineral found in many foods, especially milk, fruits, and vegetables. It affects how steadily the heart beats. Healthy kidneys keep the right amount of potassium in the blood to keep the heart beating at a steady pace. Potassium levels can rise between dialysis sessions and affect the heartbeat. Eating too much potassium can be very dangerous. It may even cause death.

To control potassium levels in the blood, avoid foods like avocados, bananas, kiwis, and dried fruit, which are very high in potassium. Also, eat smaller portions of other high-potassium foods. For example, eat half a pear instead of a whole pear. Eat only very small portions of oranges and melons.



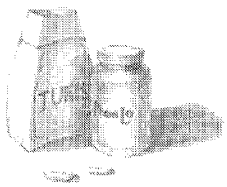
Dialyzing Potatoes and Other Vegetables
Some of the potassium from potatoes and other vegetables can be removed by peeling them, then soaking them in a large amount of water for several hours. Drain and rinse the vegetables before cooking them.

High-Potassium Foods:

apricots	kiwi fruit	potatoes
avocados	lima beans	prune juice
bananas	melons	prunes
beets	milk	raisins
Brussels sprouts	nectarines	sardines
cantaloupe	orange juice	spinach
clams	oranges	tomatoes
dates	peanuts	winter squash
figs	pears (fresh)	yogurt

What about Phosphorus?
Phosphorus is a mineral found in many foods. If there is too much phosphorus in the blood, it pulls calcium from the bones. Losing calcium will make the bones weak and likely to break. Also, too much phosphorus may cause skin itching. Foods like milk and cheese, dried beans, peas, colas, nuts, and peanut butter are high in phosphorus. Usually, people on dialysis are limited to 1/2 cup of milk per day.

Most patients will probably need to take a phosphate binder like Renagel, PhosLo, Tums, or calcium carbonate to control the phosphorus in the blood between dialysis sessions. These medications act like sponges to soak up, or bind, phosphorus while it is in the stomach.



Because it is bound, the phosphorus does not get into the blood. Instead, it is passed out of the body in the stool. Taking a phosphate binder helps control phosphorus in the blood.

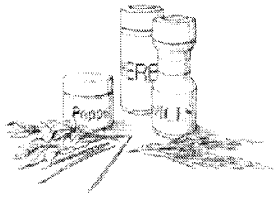
What about Protein?
Before the patient is on dialysis, their doctor may have told them to follow a low-protein diet. Being on dialysis changes this. Most people on dialysis are encouraged to eat as much high-quality protein as they can. Protein helps keep muscle and repair tissue. The better nourished the patient is, the healthier they will be. They will also have greater resistance to infection and recover from surgery more quickly.

Protein is broken down in the body into a waste product called urea. If urea builds up in the blood, it's a sign of declining condition. Eating mostly high-quality proteins is important because they produce less waste than others. High-quality proteins come from meat, fish, poultry, and eggs (especially egg whites).

Poultry and fish, like broiled flounder, are good sources of high-quality protein.

What about Sodium?
Sodium is found in salt and other foods. Most canned foods and frozen dinners contain large amounts of sodium. Too much sodium creates thirst. But if more fluid is consumed, the heart has to work harder to pump the fluid through the body. Over time, this can cause high blood pressure and congestive heart failure.

The patient should try to eat fresh foods that are naturally low in sodium. Look for products labeled *low sodium.*



Find new ways to spice up food. Do not use salt substitutes because they contain potassium. A dietitian can help the patient find spices and spice blends to use to flavor foods that are sodium and potassium free.

What about Calories?
Calories provide energy for the body. Some people on dialysis may need to cut calories. A dietitian will need to help plan the appropriate diet for the patient.

Some people need to gain weight and will need to find ways to add calories to their diet. Vegetable oils—like olive oil, canola oil, and safflower oil—are good sources of calories. Use them generously on breads, rice, and noodles.

Butter and margarines are rich in calories. But these fatty foods can also clog arteries. Use them less often. Soft margarine that comes in a tub is better than stick margarine. Vegetable oils are the healthiest way to add fat to the diet if the patient needs to gain weight.

Hard candy, sugar, honey, jam, and jelly provide calories and energy without clogging arteries or adding other things that the body does not need. **If the patient has diabetes, be very careful about eating sweets. A dietitian's guidance is very important for people with diabetes.**

What about Vitamin and Mineral Supplements?
Vitamins and minerals may be missing from the patient's diet because so many foods must be avoided. The doctor may prescribe a vitamin and mineral supplement like Nephrocaps.

Warning: Do not take vitamin supplements off the store shelf. They may contain vitamins or minerals that are harmful to the hemodialysis patient. Only vitamins prescribed by a doctor should be taken.

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Diet for Peritoneal Dialysis

A peritoneal dialysis diet is slightly different from a hemodialysis diet.

- Still need to limit salt and liquids, but may be able to have more of each, compared with hemodialysis.
- The patient must eat more protein.
- The patient may have different restrictions on potassium.
- The patient may need to cut back on the number of calories they eat because there are calories in the dialysis fluid that may cause them to gain weight.

Adapted (8-07) from NIH Publication No. 07–4274 Publication date, December 2006.

Systemic Lupus Erythematosus (Lupus)

Definition

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.

Characteristics

- 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:
    - Joints
    - Skin
    - Kidneys
    - Heart
    - Lungs
    - Blood vessels
    - Brain

Functional Considerations

- 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).

Systemic Lupus Erythematosus (Lupus)

What is Lupus?

Lupus is one of many disorders of the immune system known as **autoimmune diseases**. In autoimmune diseases, the immune system turns against parts of the body it is designed to protect. This leads to inflammation and damage to various body tissues.

At present, there is **no cure for lupus**. However, lupus can be effectively treated with drugs, and most people with the disease can lead active, healthy lives. 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:

- Joints
- Skin
- Kidneys
- Heart
- Lungs
- Blood vessels
- Brain

Although people with the disease may have many different symptoms, some of the most common ones include extreme fatigue, painful or swollen joints (arthritis), unexplained fever, skin rashes, and kidney problems.

There are many kinds of lupus:

- **Systemic lupus erythematosus,** the most common type affects many parts of the body. The word "systemic" means the disease can affect many parts of the body. The symptoms of SLE may be mild or serious. Although SLE usually first affects people between the ages of 15 and 45 years, it can occur in childhood or later in life as well.
- **Discoid lupus erythematosus** – a chronic skin disorder in which a red, raised rash appears on the face, scalp, or elsewhere. The raised areas may become thick and scaly and may cause scarring. The rash may last for days or years and may recur. A small percentage of people with discoid lupus have or develop SLE later.
- **Subacute cutaneous lupus erythematosus** – causes skin lesions that appear on parts of the body exposed to sun. The lesions do not cause scarring.
- **Drug-induced lupus** – can be caused by medications.
- **Neonatal lupus** – a rare type of lupus that affects newborns.

Who Gets Lupus?

Anyone can get lupus, but it most often affects women. Lupus is also more common in women of African American, Hispanic, Asian, and Native American descent than in Caucasian women.

What Causes Lupus?

Lupus is a complex disease, and its cause is unknown. It is likely that a combination of genetic, environmental, and possibly hormonal factors work together to cause the disease. The fact that lupus can run in families indicates that its development has a genetic basis.

What are the Symptoms of Lupus?

Symptoms of lupus vary, but some of the 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

Less common symptoms include:

- Anemia (a decrease in red blood cells)
- Headaches
- Dizzy spells
- Feeling sad
- Confusion
- Seizures

Symptoms may come and go. The times when a person is having symptoms are called **flares**, which can range from mild to severe. New symptoms may appear at any time.

In some people with lupus, only one system of the body, such as the skin or joints, is affected. Other people experience symptoms in many parts of their body. Just how seriously a body system is affected varies from person to person. The following systems in the body also can be affected by lupus.

- **Kidneys**: Inflammation of the kidneys (nephritis) can impair their ability to get rid of waste products and other toxins from the body effectively. There is usually no pain associated with kidney involvement, although some patients may notice swelling in their ankles. Most often, the only indication of kidney disease is an abnormal urine or blood test. Because the kidneys are so important to overall health, lupus affecting the kidneys generally requires intensive drug treatment to prevent permanent damage.
- **Lungs**: Some people with lupus develop pleuritis, an inflammation of the lining of the chest cavity that causes chest pain, particularly with breathing. Patients with lupus also may get pneumonia.
- **Central nervous system**: In some patients, lupus affects the brain or central nervous system. This can cause headaches, dizziness, memory disturbances, vision problems, seizures, stroke, or changes in behavior.
- **Blood vessels**: Blood vessels may become inflamed (vasculitis), affecting the way blood circulates through the body. The inflammation may be mild and may not require treatment or may be severe and require immediate attention.
- **Blood:** People with lupus may develop anemia, leukopenia (a decreased number of white blood cells), or thrombocytopenia (a decrease in the number of platelets in the blood, which assist in clotting). Some people with lupus may have an increased risk for blood clots.
- **Heart:** In some people with lupus, inflammation can occur in the heart itself (myocarditis and endocarditis) or the membrane that surrounds it (pericarditis), causing chest pains or other symptoms. Lupus can also increase the risk of atherosclerosis (hardening of the arteries).

How is Lupus Diagnosed?

Diagnosing lupus can be difficult. It may take months or even years for doctors to piece together the symptoms to diagnose this complex disease accurately. No single test can determine whether a person has lupus. The doctor may use many tools to make a diagnosis:

- Medical history
- Complete exam
- Blood tests - The most useful tests identify certain autoantibodies often present in the blood of people with lupus
- Skin biopsy (looking at skin samples under a microscope)
- Kidney biopsy (looking at tissue from the kidney under a microscope)

How is Lupus Treated?

There are many specialists who will be involved in treatment of the symptoms of lupus.

The **health care team** may include:

- A family doctor
- Rheumatologists – doctors who treat arthritis and other diseases that cause swelling in the joints
- Clinical immunologists – doctors who treat immune system disorders
- Nephrologists – doctors who treat kidney disease
- Hematologists – doctors who treat blood disorders
- Dermatologists – doctors who treat skin diseases
- Neurologists – doctors who treat problems with the nervous system
- Nurses
- Psychologists
- Social workers

The range and effectiveness of treatments for lupus have increased dramatically, giving doctors more choices in how to manage the disease. It is important for the patient to work closely with the doctor and take an active role in managing the disease. Once lupus has been diagnosed, the doctor will develop a treatment plan based on the patient's age, sex, health, symptoms, and lifestyle. Treatment plans are tailored to the individual's needs and may change over time. The patient should report new symptoms to the doctor right away so that treatment can be changed if needed.

The **goals of the treatment** plan are to:

- Prevent flares
- Treat flares when they occur
- Reduce organ damage and other problems

Treatments may include **medications** to:

- Reduce swelling and pain
- Prevent or reduce flares
- Calm the immune system
- Reduce or prevent damage to joints

Nonsteroidal anti-inflammatory drugs (NSAIDs):

- Drugs that decrease inflammation.
- For people with joint or chest pain or fever.
- May be used alone or in combination with other types of drugs to control pain, swelling, and fever.
- Common side effects of NSAIDs can include stomach upset, heartburn, diarrhea, and fluid retention. Some people with lupus also develop liver, kidney, or even neurological complications, making it especially important to stay in close contact with the doctor while taking these medications.

Antimalarials:

- It may be used alone or in combination with other drugs and generally is used to treat fatigue, joint pain, skin rashes, and inflammation of the lungs.
- Clinical studies have found that continuous treatment with antimalarials may prevent flares from recurring.
- A common antimalarial used to treat lupus is hydroxychloroquine (Plaquenil)*.
- Side effects of antimalarials can include stomach upset and, extremely rarely, damage to the retina of the eye.
- Antimalarials are another type of drug commonly used to treat lupus.

Corticosteroids:

- The mainstay of lupus.
- Are related to cortisol which is a natural anti-inflammatory hormone. They work by rapidly suppressing inflammation.
- Commonly used drugs: prednisone (Deltasone), hydrocortisone, methylprednisolone (Medrol), and dexamethasone (Decadron, Hexadrol).
- Can be given by mouth, in creams applied to the skin, or by injection.
- Because they are potent drugs, the doctor will seek the lowest dose with the greatest benefit.
- Short-term side effects include swelling, increased appetite, and weight gain. These side effects generally stop when the drug is stopped.
- **It is dangerous to stop taking corticosteroids suddenly**, so it is very important that the doctor and patient work together in changing the corticosteroid dose.
- Long-term side effects of corticosteroids can include stretch marks on the skin, weakened or damaged bones (osteoporosis and osteonecrosis), high blood pressure, damage to the arteries, high blood sugar (diabetes), infections, and cataracts. Typically, the higher the dose and the longer they are taken, the greater the risk and severity of side effects.

Immunosuppressives:

- Restrain the overactive immune system by blocking the production of immune cells.
- Used with patients whose kidneys or central nervous systems are affected by lupus.
- Commonly used drugs: cyclophosphamide (Cytoxan) and mycophenolate mofetil (CellCept).
- May be given by mouth or by IV infusion.
- Side effects may include nausea, vomiting, hair loss, bladder problems, decreased fertility, and increased risk of cancer and infection. The risk for side effects increases with the length of treatment.
  As with other treatments for lupus, there is a risk of relapse after the immunosuppressives have been stopped.

BLyS-specific inhibitors:

- Belimumab (Benlysta), a B-lymphocyte stimulator (BLyS) protein inhibitor, was approved by the U.S. Food and Drug Administration (FDA) in March 2011 for patients with lupus who are receiving other standard therapies, including those listed above. Given by IV infusion, it may reduce the number of abnormal B cells thought to be a problem in lupus. The most common side effects include nausea, diarrhea, and fever. Patients may also experience reactions at the infusion site, for which antihistamines can be given in advance. Less commonly, serious infections may result.
- In studies conducted so far, African American patients and patients of African heritage did not appear to respond to belimumab. An additional study of this patient population will be conducted to further evaluate belimumab in this subgroup of lupus patients. However, this difference in response to a treatment may be another indicator of the various ways that the disease affects different patients.

Methotrexate:
- Not as commonly used.
- Disease-modifying antirheumatic drug.
- Commonly used drugs: Folex, Mexate, Rheumatrex.
- Treatments may cause harmful side effects, it is important to report any new symptoms to the doctor promptly.

Alternative treatments are those that are not part of standard treatment. No research shows that this kind of treatment works for people with lupus. The patient should talk to their doctor about alternative treatments.

What Can I Do?

It is vital that the patient take an active role in their treatment. One key to living with lupus is to know about the disease and its impact. Being able to spot the warning signs of a flare can help prevent the flare or make the symptoms less severe.

Many people with lupus have certain symptoms just before a flare, such as:
- Feeling more tired
- Pain
- Rash
- Fever
- Stomach ache
- Headache
- Dizziness

The patient should **see the doctor often**, even when symptoms are not severe. These visits will help:
- Look for changes in symptoms
- Predict and prevent flares
- Change the treatment plan as needed
- Detect side effects of treatment

Patient Tips for Working with their Doctor(s)

Seek a health care provider who is familiar with SLE and who will listen to and address concerns.
- Provide complete, accurate medical information.
- Make a list of questions and concerns in advance.
- Be honest and share their point of view with the health care provider.
- Ask for clarification or further explanation if needed.
- Talk to other members of the health care team, such as nurses, therapists, or pharmacists.
- Do not hesitate to discuss sensitive subjects (for example, birth control, intimacy).
- Discuss any treatment changes with before making them.

It is also important to find **ways to cope with the stress** of having lupus.
- **Exercising**
- Finding ways to **relax** may make it easier to cope.
- **Good support system** can also help. A support system may include family, friends, community groups, or doctors.
- **Support groups** to be very useful. Besides providing support, taking part in a support group can make the patient feel better about himself and help keep a good outlook.

Learning more about lupus is very important. Studies have shown that **patients who are informed and involved in their own care**:

- Have less pain.
- Make fewer visits to the doctor.
- Feel better about themselves.
- Remain more active.

What Do Pregnant Women with Lupus Need to Know?

Although a lupus pregnancy is considered high risk, most women with lupus carry their babies safely to the end of their pregnancy. Women with lupus have a higher rate of miscarriage and premature births compared with the general population. In addition, women who have antiphospholipid antibodies are at a greater risk of miscarriage in the second trimester because of their increased risk of blood clotting in the placenta.

What are Researchers Trying to Learn about Lupus?

Lupus is the focus of intense research. Studies are looking at:

- The genes that play a role in lupus and in the immune system
- Ways to change the immune system in people with lupus
- Lupus in ethnic groups
- Things in the environment that may cause lupus
- The role of hormones in lupus
- Birth control pills and hormone therapy in women with lupus
- Heart disease in people with lupus
- Drugs that lower cholesterol in children with lupus
- The causes of nervous system damage in people with lupus
- Treatments for lupus

Adapted (10/2012) from NIH Publication No. 03-4178(August 2011) from U.S. Department of Health and Human Services, Public Health Service, National Institutes of Health, National Institute of Arthritis and Musculoskeletal and Skin Diseases http://www.niams.nih.gov.

Multiple Sclerosis (MS)

Definition
MS is a chronic, inflammatory, demyelinating disease that affects the central nervous system.

Characteristics
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
    - Primary-progressive (PP)
    - Secondary-progressive (SP)
    - Progressive-relapsing (PR)
- Benign
- Malignant

Functional Considerations
- 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.

Multiple Sclerosis

What is Multiple Sclerosis?

During an MS attack, inflammation occurs in areas of the white matter of the central nervous system in random patches called **plaques**. This process is followed by **destruction of myelin**, the fatty covering that insulates nerve cell fibers in the brain and spinal cord. Myelin facilitates the smooth, high-speed transmission of electrochemical messages between the brain, the spinal cord, and the rest of the body; when it is damaged, neurological transmission of messages may be slowed or blocked completely, leading to diminished or lost function. The name "multiple sclerosis" signifies both the number (multiple) and condition (sclerosis, from the Greek term for scarring or hardening) of the demyelinated areas in the central nervous system.

How Many People Have MS?

No one knows exactly how many people have MS. It is believed that, currently, there are approximately 250,000 to 350,000 people in the United States with MS diagnosed by a physician. This estimate suggests that approximately 200 new cases are diagnosed each week.

Who Gets MS?

Most people experience their first symptoms of MS between the ages of 20 and 40, but a diagnosis is often delayed.

Whites are more than twice as likely as other races to develop MS. In general, **women** are affected at almost twice the rate of men; however, among patients who develop the symptoms of MS at a later age, the gender ratio is more balanced.

MS is five times more prevalent in **temperate climates**-such as those found in the northern United States, Canada, and Europe-than in tropical regions. Furthermore, the age of 15 seems to be significant in terms of risk for developing the disease: some studies indicate that a person moving from a high-risk (temperate) to a low-risk (tropical) area before the age of 15 tends to adopt the risk (in this case, low) of the new area and vice versa. Other studies suggest that people moving after age 15 maintain the risk of the area where they grew up.

These findings indicate a **strong role for an environmental factor** in the cause of MS. It is possible that, at the time of or immediately following puberty, patients acquire an infection with a long latency period. Or, conversely, people in some areas may come in contact with an unknown protective agent during the time before puberty. Other studies suggest that the unknown geographic or climatic element may actually be simply a matter of genetic predilection and reflect racial and ethnic susceptibility factors.

Periodically, scientists receive reports of MS "clusters." The most famous of these MS "epidemics" took place in the Faeroe Islands north of Scotland in the years following the arrival of British troops during World War II. Despite intense study of this and other clusters, no direct environmental factor has been identified. Nor has any definitive evidence been found to link daily stress to MS attacks, although there is evidence that the risk of worsening is greater after acute viral illnesses.

What Causes MS?

Scientists have learned a great deal about MS in recent years; still, its cause remains elusive. Many investigators believe MS to be an autoimmune disease-one in which the body, through its immune system, launches a defensive attack against its own tissues. In the case of MS, it is the nerve-insulating myelin that comes under assault. Such assaults may be linked to an unknown environmental trigger, perhaps a virus.

Scientists have studied a number of infectious agents (such as viruses) that have been suspected of causing MS, but have been unable to implicate any one particular agent. Viral infections are usually accompanied by inflammation and the production of gamma interferon, a naturally occurring body chemical that has been shown to worsen the clinical course of MS. It is possible that the immune response to viral infections may themselves precipitate an MS attack. There seems to be little doubt that something in the environment is involved in triggering MS.

Genetics

In addition, increasing scientific evidence suggests that **genetics may play a role in determining a person's susceptibility to MS**.

In the population at large, the chance of developing MS is less than a tenth of one percent. However, if one person in a family has MS, that person's first-degree relatives-parents, children, and siblings-have a one to three percent chance of getting the disease. For identical twins, the likelihood that the second twin may develop MS if the first twin does is about 30 percent; for fraternal twins (who do not inherit identical gene pools), the likelihood is closer to that for non-twin siblings, or about 4 percent. Studies have confirmed a possible genetic link.

What is the Course of MS?

Each case of MS displays one of several patterns of presentation and subsequent course.

Relapsing-remitting (RR)	A series of attacks followed by complete or partial remissions as symptoms mysteriously lessen, only to return later after a period of stability
Chronic progressive MS	
• Primary-progressive (PP)	Characterized by a gradual clinical decline with no distinct remissions, although there may be temporary plateaus or minor relief from symptoms
• Secondary-progressive (SP)	Begins with a relapsing-remitting course followed by a later primary-progressive course
• progressive-relapsing (PR)	Rare - a course in which the disease takes a progressive path punctuated by acute attacks
Benign form	Twenty percent of the MS population-symptoms show little or no progression after the initial attack; these patients remain fully functional
Malignant MS	A swift and relentless decline resulting in significant disability or even death shortly after disease onset

MS is very rarely fatal and most people with MS have a fairly normal life expectancy.

What are the Symptoms of MS?

Vision disturbances	• Often initial symptom • May be blurred or double vision, red-green color distortion, or even blindness in one eye
Muscle weakness	• These symptoms may be severe enough to impair walking or even standing. In the worst cases, MS can produce partial or complete paralysis.
Spasticity	• Spasticity-leads to stiffness and spasms
Fatigue	• May be triggered by physical exertion and improve with rest, or it may take the form of a constant and persistent tiredness

Paresthesias	• Transitory abnormal sensory feelings such as numbness, prickling, or "pins and needles" sensations
Heat sensitivity	• Heat-whether generated by temperatures outside the body or by exercise-may cause temporary worsening of many MS symptoms
Pain	• Moderate to severe - more uncommon, but may occur
Speech disturbances	• Speech disorders are called dysarthrias. • Long Pauses - one pattern that is commonly associated with MS is so-called "scanning'" speech which produces speech in which the speech pattern is disrupted, with abnormally long pauses between words or individual syllables of words. • Slurred or Nasal Sounding speech
Cognitive abnormalities	• Difficulties with concentration, attention, memory, and poor judgment, but such symptoms are usually mild and are frequently overlooked • Impairments are usually mild, rarely disabling, and intellectual and language abilities are generally spared • Scientists do not yet know whether altered cognition in MS reflects problems with information acquisition, retrieval, or a combination of both.
Ataxia Tremor Vertigo	• All effect steadiness on feet and ambulation
Bladder dysfunction	• Most common bladder problems encountered by MS patients are urinary frequency, urgency, or incontinence. A small number of patients, however, retain large amounts of urine
Bowel dysfunction	• Constipation being the most frequent problem
Depression	• Depression can intensify symptoms of fatigue, pain, and sexual dysfunction.
Euphoria	• Five percent may experience episodes of inappropriate euphoria and despair-unrelated to the patient's actual emotional state-known as "laughing/weeping syndrome." This syndrome is thought to be due to demyelination in the brainstem, the area of the brain that controls facial expression and emotions, and is usually seen only in severe cases.
Sexual dysfunction	• Men may experience occasional failure to attain an erection. • Women may experience insufficient lubrication or have difficulty reaching orgasm.

The erratic symptoms of MS can affect the entire family as patients may become unable to work at the same time they are facing high medical bills and additional expenses for housekeeping assistance and modifications to homes and vehicles. The emotional drain on both patient and family is immeasurable. Support groups (listed on a card in the pocket at the back of this pamphlet) and counseling may help MS patients, their families, and friends find ways to cope with the many problems the disease can cause.

Drugs Used to Treat Symptoms of Multiple Sclerosis

Symptom	Drug
Spasticity	Baclofen (Lioresal) Tizanidine (Zanaflex) Diazepam (Valium) Clonazepam (Klonopin) Dantrolene (Dantrium)
Optic neuritis	Methylprednisolone (Solu-Medrol) Oral steroids
Fatigue	Antidepressants Amantadine (Symmetrel) Pemoline (Cylert)
Pain	Aspirin or acetaminophen Antidepressants Codeine
Trigeminal neuralgia	Carbamazapine, other anticonvulsant
Sexual dysfunction	Papaverine injections(in men)

How is MS Diagnosed?

There is no single test that unequivocally detects MS. When faced with a patient whose symptoms, neurological exam results, and medical history suggest MS, physicians use a variety of tools to rule out other possible disorders and perform a series of laboratory tests which, if positive, confirm the diagnosis.

MRI	• Can help locate central nervous system lesions resulting from myelin loss • If used in conjunction with a contrast agent can help distinguish new plaques from old • However, since these lesions can also occur in several other neurological disorders, they are not absolute evidence of MS.
Magnetic resonance spectroscopy (MRS)	• Yields information about the brain's biochemistry • Decreased levels of brain chemical N-acetyl aspartate can indicate nerve damage
Magnetization transfer imaging (MTI)	• Able to detect white matter abnormalities before lesions can be seen on standard MRI scans by calculating the amount of "free" water in tissues • Demyelinated tissues and damaged nerves show increased levels of free" (versus "bound") water particles

Diffusion-tensor magnetic resonance imaging (DT-MRI or DTI)	• Measures the random motion of water molecules creating three-dimensional images indicating the size and location of demyelinated areas of the brain • Can measure disease progression
Functional MRI (fMRI)	• Uses radio waves and a strong magnetic field to measures the correlation between physical changes in the brain (such as blood flow) and mental functioning during the performance of cognitive tasks
Visual evoked potential (VEP)	• Measure the speed of the brain's response to visual stimuli • Can sometimes detect lesions that the scanners miss and is particularly useful when abnormalities seen on MRI do not meet the specific criteria for MS
Studies of cerebrospinal fluid	• Can show cellular and chemical abnormalities often associated with MS • Includes increased numbers of white blood cells and higher-than-average amounts of protein, especially myelin basic protein and an antibody called immunoglobulin G

Can MS be Treated?

There is as yet no cure for MS. Many patients do well with no therapy at all, especially since many medications have serious side effects and some carry significant risks.

Steroids adrenocorticotropic hormone (ACTH), prednisone, prednisolone, methylprednisolone, betamethasone, and dexamethasone	• Used for anti-inflammatory purposes
Interferon Avonex, Betaseron, and Rebif)	• naturally occurring antiviral proteins Beta interferon has been shown to reduce the number of exacerbations and may slow the progression of physical disability • MRI scans suggest that beta interferon can decrease myelin destruction.
Immunotherapy Novantrone (mitoxantrone)	• Results of recent clinical trials have shown that immunosuppressive agents and techniques can positively (if temporarily) affect the course of MS; however, toxic side effects often preclude their widespread use. • Generalized immunosuppression leaves the patient open to a variety of viral, bacterial, and fungal infections. Most of these therapies are, at this time, still considered experimental.
Monoclonal antibodies natalizumab (Tysabri),	• are identical, laboratory-produced antibodies that are highly specific for a single antigen. They are injected into the patient in the hope that they will alter the patient's immune response.

Plasmapheresis (plasma exchange)	• blood is removed from the patient and the blood plasma is separated from other blood substances that may contain antibodies and other immunologically active products • These other blood substances are discarded and the plasma is then transfused back into the patient • Effectiveness not proven
Bone marrow transplantation	• No data of effectiveness – being studied
Honey bee venom	• No data of effectiveness – being studied

Diet

Over the years, many people have tried to implicate diet as a cause of or treatment for MS. Some physicians have advocated a diet low in saturated fats; others have suggested increasing the patient's intake of linoleic acid, a polyunsaturated fat, via supplements of sunflower seed, safflower, or evening primrose oils. Other proposed dietary "remedies" include megavitamin therapy, including increased intake of vitamins B12 or C; various liquid diets; and sucrose-, tobacco-, or gluten-free diets. To date, clinical studies have not been able to confirm benefits from dietary changes; in the absence of any evidence that diet therapy is effective; patients are best advised to eat a balanced, wholesome diet.

Unproven Therapies

At one time or another, many ineffective and even potentially dangerous therapies have been promoted as treatments for MS. A partial list of these "therapies" includes: injections of snake venom, electrical stimulation of the spinal cord's dorsal column, removal of the thymus gland, breathing pressurized (hyperbaric) oxygen in a special chamber, injections of beef heart and hog pancreas extracts, intravenous or oral calcium orotate (calcium EAP), hysterectomy, removal of dental fillings containing silver or mercury amalgams, and surgical implantation of pig brain into the patient's abdomen. None of these treatments is an effective therapy for MS or any of its symptoms.

Glossary of Terms

antibodies - proteins made by the immune system that bind to structures (antigens) they recognize as foreign to the body.
antigen - a structure foreign to the body, such as a virus. The body usually responds to antigens by producing antibodies.
ataxia - a condition in which the muscles fail to function in a coordinated manner.
autoimmune disease - a disease in which the body's defense system malfunctions and attacks a part of the body itself rather than foreign matter.
blood/brain barrier - a membrane that controls the passage of substances from the blood into the central nervous system.
cerebrospinal fluid - the colorless liquid, consisting partially of substances filtered from blood and partially by secretions released by brain cells, that circulates around and through the cavities of the brain and spinal cord. Physicians use a variety of tests-electrophoresis, isoelectric focusing, capillary isotachophoresis, and radioimmunoassay-to study cerebrospinal fluid for abnormalities often associated with MS.
cytokines - powerful chemical substances secreted by T cells. Cytokines are an important factor in the production of inflammation and show promise as treatments for MS.
demyelination - damage caused to myelin by recurrent attacks of inflammation. Demyelination ultimately results in nervous system scars, called plaques, which interrupt communications between the nerves and the rest of the body.
experimental allergic encephalomyelitis (EAE) - a chronic brain and spinal cord disease similar to MS which is induced by injecting myelin basic protein into laboratory animals.
fatigue - tiredness that may accompany activity or may persist even without exertion.
gadolinium - a chemical compound given during MRI scans that helps distinguish new lesions from old.
human leukocyte antigens (HLAs) - antigens, tolerated by the body, that correspond to genes that govern immune responses. Also known as
major histocompatibility complex.
immunoglobulin G (IgG) - an antibody-containing substance produced by human plasma cells in diseased central nervous system plaques. Levels of IgG are increased in the cerebrospinal fluid of most MS patients.
immunosuppression - suppression of immune system functions. Many medications under investigation for the treatment of MS are immunosuppressants.
interferons - cytokines belonging to a family of antiviral proteins that occur naturally in the body. Gamma interferon is produced by immune system cells, enhances T-cell recognition of antigens, and causes worsening of MS symptoms. Alpha and beta interferon probably exert a suppressive effect on the immune system and may be beneficial in the treatment of MS.
lesion - an abnormal change in the structure of an organ due to disease or injury.
magnetic resonance imaging (MRI) - a non-invasive scanning technique that enables investigators to see and track MS lesions as they evolve.
myelin - a fatty covering insulating nerve cell fibers in the brain and spinal cord, myelin facilitates the smooth, high-speed transmission of electrochemical messages between these components of the central nervous system and the rest of the body. In MS, myelin is damaged through a process known as demyelination, which results in distorted or blocked signals.
myelin basic protein (MBP) - a major component of myelin. When myelin breakdown occurs (as in MS), MBP can often be found in abnormally high levels in the patient's cerebrospinal fluid. When injected into laboratory animals, MBP induces experimental allergic encephalomyelitis, a chronic brain and spinal cord disease similar to MS.
oligodendrocytes - cells that make and maintain myelin.
optic neuritis - an inflammatory disorder of the optic nerve that usually occurs in only one eye and causes visual loss and sometimes blindness. It is generally temporary.
paresthesias - abnormal sensations such as numbness, prickling, or "pins and needles."
plaques - patchy areas of inflammation and demyelination typical of MS, plaques disrupt or block nerve signals that would normally pass through the regions affected by the plaques.
receptor - a protein on a cell's surface that allows the cell to identify antigens.
retrobulbar neuritis - an inflammatory disorder of the optic nerve that is usually temporary. It causes rapid loss of vision and may cause pain upon moving the eye.

spasticity - involuntary muscle contractions leading to spasms and stiffness or rigidity. In MS, this condition primarily affects the lower limbs.
T cells - immune system cells that develop in the thymus gland. Findings suggest that T cells are implicated in myelin destruction.
transverse myelitis - an acute spinal cord disorder causing sudden low back pain and muscle weakness and abnormal sensory sensations in the lower extremities. Transverse myelitis often remits spontaneously; however, severe or long-lasting cases may lead to permanent disability.
white matter - nerve fibers that are the site of MS lesions and underlie the gray matter of the brain and spinal cord.

Adapted (8-07) from: "Multiple Sclerosis: Hope through Research," NINDS. Publication date September 1996. NIH Publication No. 96-75, Last updated April 16, 2007

Osteoarthritis

Definition

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.

Characteristics

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.

Functional Considerations

- 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.

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

Osteoarthritis

What is Osteoarthritis?

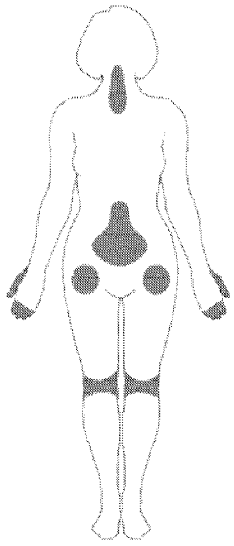
Osteoarthritis (AH-stee-oh-ar-THREYE-tis) is the most common type of arthritis, and is seen especially among older people. Sometimes it is called degenerative joint disease or osteoarthrosis.

Osteoarthritis is a joint disease that mostly affects cartilage. Cartilage is the slippery tissue that covers the ends of bones in a joint. Healthy cartilage allows bones to glide over each other. It also helps absorb shock of movement. In osteoarthritis, 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.
People with osteoarthritis often have joint pain and reduced motion. Unlike some other forms of arthritis, osteoarthritis affects only joints and not internal organs. Osteoarthritis is the most common type of arthritis.

Who Gets Osteoarthritis?

Osteoarthritis occurs most often in older people. An estimated 12.1 percent of the U.S. population (nearly 21 million Americans) age 25 and older have osteoarthritis. Before age 45, more men than women have osteoarthritis; after age 45, it is more common in women.

Younger people sometimes get osteoarthritis-usually as the result of a joint injury, a joint malformation, or a genetic defect in joint cartilage primarily from joint injuries.



What Causes Osteoarthritis?

The cause of osteoarthritis is unknown. Factors that might cause it include:

- Being overweight
- Getting older
- Joint injury
- Joints that are not properly formed
- A genetic defect in joint cartilage
- Stresses on the joints from certain jobs and playing sports.

What Areas Does Osteoarthritis Affect?

People with osteoarthritis usually experience joint pain and stiffness. The most commonly affected joints are those at the ends of the fingers (closest to the nail), thumbs, neck, lower back, knees, and hips.

Osteoarthritis affects different people differently. Although in some people it progresses quickly, in most individuals joint damage develops gradually over years. In some people, osteoarthritis is relatively mild and interferes little with day-to-day-life; in others, it causes significant pain and disability.

While osteoarthritis is a disease of the joints, its effects are not just physical. In many people with osteoarthritis, lifestyle and finances also decline.

Lifestyle effects include

- depression
- anxiety
- feelings of helplessness
- limitations on daily activities
- job limitations
- difficulty participating in everyday personal and family joys and responsibilities.

Financial effects include

- the cost of treatment
- wages lost because of disability.

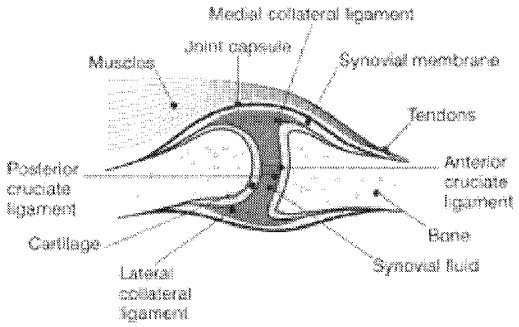
Fortunately, most people with osteoarthritis live active, productive lives despite these limitations. They do so by using treatment strategies such rest and exercise, pain relief medications, education and support programs, learning self-care, and having a "good attitude."

Osteoarthritis Basics: The Joint

A joint is the point where two or more bones are connected. With a few exceptions (in the skull and pelvis, for example), joints are designed to allow movement between the bones and to absorb shock from movements like walking or repetitive motions.

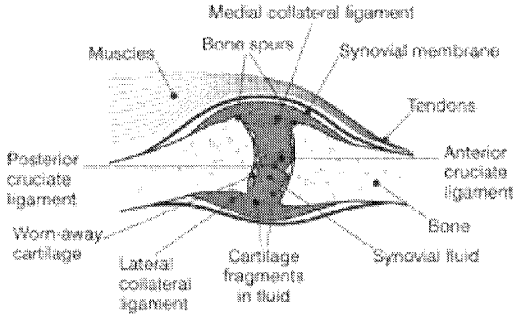
A Healthy Joint

In a healthy joint, the ends of bones are encased in smooth cartilage. Together, they are protected by a joint capsule lined with a synovial membrane that produces synovial fluid. The capsule and fluid protect the cartilage, muscles, and connective tissues.



A Joint With Severe Osteoarthritis

With osteoarthritis, the cartilage becomes worn away. Spurs grow out from the edge of the bone, and synovial fluid increases. Altogether, the joint feels stiff and sore.



Signs of Osteoarthritis

Usually, osteoarthritis comes on slowly. Early in the disease, the joints may ache after physical work or exercise. Later on, joint pain may become more persistent. There also may be joint stiffness, particularly first thing in the morning or after having been in one position for a long time.

For information on the joints most often affected by osteoarthritis, please see the following descriptions below:

Hands	• Osteoarthritis of the hands seems to have some hereditary characteristics; that is, it runs in families • Women are more likely than men to have hand involvement and, for most, it develops after menopause. • Small, bony knobs may appear on the end joints (those closest to the nails) of the fingers cause deformity and further disability. • The base of the thumb joint also is commonly affected by osteoarthritis.
Knees	• The knees are among the joints most commonly affected by osteoarthritis. • Symptoms include stiffness, swelling, and pain, which make it hard to walk, climb, and get in and out of chairs and bathtubs. • Can lead to disability.
Hips	• The hips are also common sites of osteoarthritis • Symptoms of hip osteoarthritis include pain and stiffness of the joint itself. • May limit moving and bending, making daily activities such as dressing and putting on shoes a challenge.
Spine	• May show up as stiffness and pain in the neck or lower back. • In some cases, changes in the spine can cause pressure on the nerves where they exit the spinal column, resulting in weakness or numbness of the arms and legs.

How is Osteoarthritis Diagnosed?

Osteoarthritis can occur in any joint. It occurs most often in the hands, knees, hips, and spine.

The Warning Signs of Osteoarthritis

- stiffness in a joint after getting out of bed or sitting for a long time
- swelling in one or more joints
- a crunching feeling or the sound of bone rubbing on bone

About a third of people whose x-rays show evidence of osteoarthritis report **pain** or other symptoms. For those who experience steady or intermittent pain, it is typically aggravated by activity and relieved by rest.

If the patient feels **hot** or their skin turns **red**, they probably do not have osteoarthritis. Check with the doctor about other causes, such as rheumatoid arthritis.

No single test can diagnose osteoarthritis. Most doctors use a combination of the following methods to diagnose the disease and rule out other conditions:

Clinical history	• Description of symptoms, when and how they condition started, as well as how they have changed over time • Other medical problems the patient and close family members have • Any medications the patient is taking

Physical examination	• The doctor will check the patient's reflexes and general health, including muscle strength. • Will also examine bothersome joints and observe the patient's ability to walk, bend, and carry out activities of daily living.
X-rays	• To see how much joint damage has been done. • X-rays of the affected joint can show such things as cartilage loss, bone damage, and bone spurs. • Often is a big difference between the severity of osteoarthritis as shown by the x-ray and the degree of pain and disability felt by the patient. • May not show early osteoarthritis damage before much cartilage loss has taken place.
Magnetic resonance imaging (MRI)	• Provides high-resolution computerized images of internal body tissues. • Used if there is pain; if x-ray findings are minimal; and if the findings suggest damage to other joint tissues such as a ligament, or the pad of connective tissue in the knee known as the meniscus.
Other tests	• Blood tests to rule out other causes of symptoms • Joint aspiration, which involves drawing fluid from the joint through a needle and examining the fluid under a microscope.

How is Osteoarthritis Treated?

Doctors often combine treatments to fit a patient's needs, lifestyle, and health. Osteoarthritis treatment has **four main goals**:

1. Improve joint function
2. Keep a healthy body weight
3. Control pain
4. Achieve a healthy lifestyle.

Most successful treatment programs involve a combination of treatments tailored to the patient's needs, lifestyle, and health. Most programs include ways to manage pain and improve function.

Doctors prescribe medicines to eliminate or reduce pain and to improve functioning. Doctors consider a number of factors when choosing medicines for their patients with osteoarthritis. These include the intensity of pain, potential side effects of the medication, medical history, and other medications taken.

Exercise	• Exercise is one of the best treatments for osteoarthritis. • Can improve mood and outlook, decrease pain, increase flexibility, strengthen the heart and improve blood flow, maintain weight, and promote general physical fitness. • Amount and form of exercise prescribed will depend on which joints are involved • Walking, swimming, and water aerobics are a few popular types of exercise • May take NSAIDs to make exercising easier and/or use ice afterward.
Weight control	• Patients who are overweight or obese should try to lose Weight. Weight loss can reduce stress on weight-bearing joints, limit further injury, and increase mobility.

Rest and relief from stress on joints	• Patients must learn to recognize the body's signals, and know when to stop or slow down to prevent the pain caused by overexertion. • Getting proper sleep is important for managing arthritis pain - relaxation techniques, stress reduction, and biofeedback • Time medications to provide maximum pain relief through the night. • Walking aides can take pressure off painful joints. • Splints or braces to provide extra support for joints and/or keep them in proper position during sleep or activity.
Nondrug pain relief	• **Heat and cold** o Heat can be applied in a number of different ways – with warm towels, hot packs, or a warm bath or shower – to increase blood flow and ease pain and stiffness. o Cold packs (bags of ice or frozen vegetables wrapped in a towel), which reduce inflammation, can relieve pain or numb the sore area.
	• **Transcutaneous electrical nerve stimulation (TENS)** o A technique that uses a small electronic device to direct mild electric pulses to nerve endings that lie beneath the skin in the painful area. o It seems to work by blocking pain messages to the brain and by modifying pain perception.
	• **Massage** o May increase blood flow and bring warmth to a stressed area. o Must be careful over painful joint
Medications to control pain	• **Acetaminophen** – non prescription; used to relieve pain • **NSAIDs (nonsteroidal anti-inflammatory drugs) -** A large class of medications useful against both pain and inflammation, they are staples in arthritis treatment; some over the counter and some prescription • **Topical pain-relieving creams, rubs, and sprays -** contain ingredients that work in one of three different ways: by stimulating the nerve endings to distract the brain's attention from the joint pain; by depleting the amount of a neurotransmitter called substance P that sends pain messages to the brain; or by blocking chemicals called prostaglandins that cause pain and inflammation.
	• **Tramadol (Ultram)** – prescription pain reliever has the potential for addiction.
	• **Mild narcotic painkillers** –usually used short term because of dependency potential.
	• **Corticosteroids -** powerful anti-inflammatory hormones; may be injected into the affected joints to temporarily relieve pain; is a short-term measure. Oral corticosteroids are not routinely used to treat osteoarthritis. They are occasionally used for inflammatory flares.
	• **Hyaluronic acid substitutes -** designed to replace a normal component of the joint involved in joint lubrication and nutrition; given in a series of three to five injections; approved only for knee.
Surgery	• helps relieve the pain and disability of osteoarthritis • may be performed to achieve one or more of the following: o removal of loose pieces of bone and cartilage from the joint if they are causing symptoms of buckling or locking o repositioning of bones o resurfacing (smoothing out) of bones. **Artificial joint replacement** o can last 10 to 15 years or longer.

	○ The decision to use surgery depends on several factors, including the patient's age, occupation, level of disability, pain intensity, and the degree to which arthritis interferes with his or her lifestyle. ○ After surgery and rehabilitation, the patient usually feels less pain and swelling, and can move more easily.
Complementary and alternative therapies	• **Acupuncture** – used for pain relief; shown to help some patients • **Folk remedies** - include wearing copper bracelets, drinking herbal teas, taking mud baths, and rubbing WD-40 on joints to "lubricate" them; there is no scientific research to date shows that they are helpful in treating osteoarthritis. • **Nutritional supplements** - glucosamine and chondroitin sulfate have been reported to improve the symptoms of people with osteoarthritis, as have certain vitamins.

Questions to Ask the Doctor or Pharmacist about Medicines

- How often should I take this medicine?
- Should I take this medicine with food or between meals?
- What side effects might occur?
- Should I take this medicine with the other prescription medicines I take?
- Is this medication safe considering other medical conditions I have?

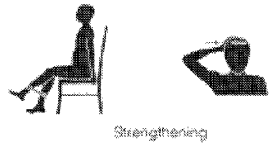
How Can Self-Care and a "Good-Health Attitude" Help?

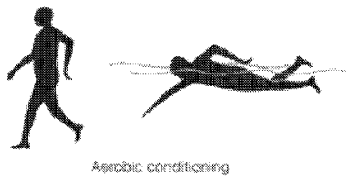
Three kinds of programs help people learn about osteoarthritis and self-care and improve their good-health attitude:

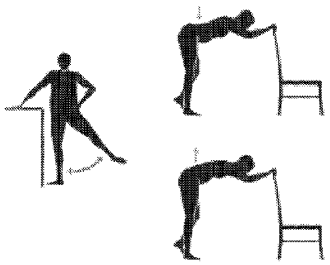
- Patient education programs
- Arthritis self-management programs
- Arthritis support groups.

These programs teach people about osteoarthritis and its treatments. They also have clear and long-lasting benefits. People in these programs learn to:

- Exercise and relax
- Talk with their doctor or other health care providers
- Solve problems.


Strengthening


Aerobic conditioning


Range of motion

People with osteoarthritis find that self-management programs help them:

- Understand the disease
- Reduce pain while staying active
- Cope with their body, mind, and emotions
- Have more control over the disease
- Live an active, independent life.

People with a good-health attitude:

- Focus on what they can do, not what they can't do
- Focus on their strengths, not their weaknesses
- Break down activities into small tasks that are easy to manage
- Build fitness and healthy eating into their daily routines
- Develop ways to lower and manage stress
- Balance rest with activity
- Develop a support system of family, friends, and health care providers.

What Research is Being Done on Osteoarthritis?

Osteoarthritis is not simply a disease of "wear and tear" that happens in joints as people get older. There is more to the disease than aging alone. Researchers are studying:

- Tools to detect osteoarthritis earlier
- Genes
- Tissue engineering
- A wide range of treatment strategies
- Osteoarthritis in animals
- Medicines to prevent joint damage
- Complementary and alternative therapies
- Vitamins and other supplements
- Injection of hyaluronic acid (a natural part of cartilage and joint fluid)
- Estrogen
- Biological and structural markers (biomarkers) for osteoarthritis.

Key Words

Acupuncture – the use of fine needles inserted at specific points on the skin. Primarily used for pain relief, acupuncture may be a helpful component of an osteoarthritis treatment plan for some people.
Analgesics – medications designed to relieve pain. Pure analgesics do not have an effect on inflammation.
Biomarkers – physical signs or biological substances that indicate changes in bone or cartilage. Doctors believe they may one day be able to use biomarkers for diagnosing osteoarthritis before it causes noticeable joint damage and for monitoring the progression of the disease and its responsiveness to treatment.
Bone spurs – small growths of bone that can occur on the edges of a joint affected by osteoarthritis. These growths are also known as osteophytes.
Bouchard's nodes – small, bony knobs associated with osteoarthritis of the hand that can occur on the middle joints of the fingers.
Cartilage – a hard but slippery coating on the end of each bone. The breakdown of joint cartilage is the primary feature of osteoarthritis.
Chondrocytes – components of cartilage. Chondrocytes are cells that produce cartilage, are found throughout cartilage, and help it stay healthy as it grows. Sometimes, however, they release certain enzymes that destroy collagen and other proteins.
Chondroitin sulfate – a naturally existing substance in joint cartilage that is believed to draw fluid into the cartilage. Chondroitin is often taken in supplement form along with glucosamine as a treatment for osteoarthritis. See the "glucosamine and chondroitin sulfate" section under Complementary and Alternative Therapies for more information.
Collagen – a family of fibrous proteins that are components of cartilage. Collagens are the building blocks of skin, tendon, bone, and other connective tissues.
Corticosteroids – powerful anti-inflammatory hormones made naturally in the body or man made for use as medicine. Corticosteroids may be injected into the affected joints to temporarily reduce inflammation and relieve pain.
COX-2 inhibitors – a relatively new class of nonsteroidal anti-inflammatory drugs (NSAIDs) that are formulated to relieve pain and inflammation. For information about the risk posed by NSAIDs, see "NSAIDs" in the "How Is Osteoarthritis Treated?" section.
Estrogen – the major sex hormone in women. Estrogen is known to play a role in regulation of bone growth. Research suggests that estrogen may also have a protective effect on cartilage.
Glucosamine – a substance that occurs naturally in the body, providing the building blocks to make and repair cartilage. See the "glucosamine and chondroitin sulfate" section under Complementary and Alternative Therapies for more information.
Heberden's nodes – small, bony knobs associated with osteoarthritis of the hand that can occur on the joints of the fingers closest to the nail.
Hyaluronic acid – a substance that gives healthy joint fluid its viscous (slippery) property and that may be reduced in people with osteoarthritis. For some people with osteoarthritis of the knee, replacing hyaluronic acid with injections of agents referred to as visco-supplements is useful for increasing lubrication, reducing pain, and improving function.
Joint capsule – a tough membrane sac that holds the bones and other joint parts together.
Ligaments – tough bands of connective tissue that attach bones to each other, providing stability.
Magnetic resonance imaging (MRI) – provides high resolution computerized images of internal body tissues. This procedure uses a strong magnet that passes a force through the body to create these images.
Muscles – bundles of specialized cells that contract and relax to produce movement when stimulated by nerves.
Nonsteroidal anti-inflammatory drugs (NSAIDs) – a class of medications available over the counter or with a prescription that ease pain and inflammation. Commonly used NSAIDs include ibuprofen (Advil, Motrin), naproxen sodium (Aleve), and ketoprofen (Orudis, Oruvail). For information about the risk posed by NSAIDs, see "NSAIDs" in the "How Is Osteoarthritis Treated?" section.
Osteoarthritis – the most common form of arthritis. It is characterized by the breakdown of joint cartilage, leading to pain, stiffness, and disability.
Osteophytes – small growths of bone that can appear on the edges of a joint affected by osteoarthritis. These growths are also known as bone spurs.

Prolotherapy – an unregulated, unproven therapy for chronic musculoskeletal pain. Prolotherapy uses an irritant solution, which is injected into painful ligaments and adjacent joint spaces to promote inflammation and subsequent healing.
Proteoglycans – components of cartilage. Made up of proteins and sugars, strands of proteoglycans interweave with collagens and form a mesh-like tissue. This allows cartilage to flex and absorb physical shock.
Rheumatoid arthritis – a form of arthritis in which the immune system attacks the tissues of the joints, leading to pain, inflammation, and eventually joint damage and malformation. It typically begins at a younger age than osteoarthritis does, causes swelling and redness in joints, and may make people feel sick, tired, and uncommonly feverish. Rheumatoid arthritis may also affect skin tissue, the lungs, the eyes, or the blood vessels.
Stem cells – primitive cells, usually taken from the bone marrow, that can transform into other kinds of cells, such as muscle or bone cells. In the future, researchers hope to be able to insert stem cells into cartilage and stimulate them to replace cartilage damaged by arthritis or injury.
Synovium – a thin membrane inside the joint capsule that secretes synovial fluid.
Synovial fluid – a fluid secreted by the synovium that lubricates the joint and keeps the cartilage smooth and healthy.
Tendons – tough, fibrous cords that connect muscles to bones.
Transcutaneous electrical nerve stimulation (TENS) – a technique that uses a small electronic device to direct mild electric pulses to nerve endings that lie beneath the skin in a painful area. TENS may relieve some arthritis pain. It seems to work by blocking pain messages to the brain and by modifying pain perception.
X ray – a procedure in which low-level radiation is passed through the body to produce a picture called a radiograph. X rays of joints affected by osteoarthritis can show such things as cartilage loss, bone damage, and bone spurs.

Adapted (8-07) from NIH Publication No. 06-4617, National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS), National Institutes of Health, www.niams.nih.gov

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.**

Complementary and Alternative Therapies for Osteoarthritis

People with the most common form of arthritis, osteoarthritis, frequently turn to complementary or alternative therapies. In 1997, a national survey reported that 26 percent of people with self-reported arthritis had used a complementary or alternative therapy within the previous 12 months. The same year, another survey reported that nearly two-thirds of rheumatology patients used complementary or alternative therapies, with osteoarthritis patients constituting the most frequent users. The most common complementary and alternative remedies are discussed below.

Facts About Osteoarthritis

There are more than 100 types of arthritis, the most common of which is osteoarthritis.

This "wear and tear" arthritis is seen most frequently in older people. Recent research suggests that genetic effects, weight, diet and injuries are also risk factors for this disease.

At present, there is no cure, but this does not mean there is no relief for the usual symptoms of pain and joint stiffness. Physical therapy, weight loss and exercise are helpful for many patients.

Conventional drug treatment with analgesics (such as acetaminophen) and nonsteroidal anti-inflammatory drugs (such as ibuprofen) is often effective in controlling pain and inflammation, but these agents do not always work well. In addition, side effects may limit their usefulness.

In severe cases, joint injections or joint surgery is appropriate.

Glucosamine

- Used for many years in Germany and other parts of Europe
- Recent research supports its effectiveness, at least as a pain reliever.
- Although glucosamine's effect on joint damage is still debated, many medical experts believe this supplement reduces pain and is safe.
- The usual dose is 500 milligrams three times a day. Twice this amount may be recommended for the first few weeks. It may take four to eight weeks to get significant benefit, and like most remedies, glucosamine does not work for everyone.
- Consider stopping after eight to 10 weeks if there is no improvement.

Chondroitin And Sam-e

- not as well studied or accepted in the United States as glucosamine.
- Most studies of these agents are of insufficient quality to draw firm conclusions.
- One study of SAM-e found the agent to have similar benefits as naproxen (Naprosyn, Aleve), used to relieve pain and inflammation.

Herbal Remedies

- Some herbs, including evening primrose, ginger, stinging nettle and curcumin, are sold as remedies for arthritis pain, but there is not enough evidence to support their use.
- Always discuss the use of herbs or other supplements with a doctor to check for interactions and side effects.
- Before seeking an herbal therapy practitioner, first consult with a doctor
- Another source of information is the National Center for Complementary and Alternative Medicine (www.nccam.nih.gov)

Homeopathy

- Homeopathy is based on administering tiny (often undetectable) amounts of a substance that in higher doses might cause symptoms or disease in healthy persons.
- Scientific evidence of benefit is lacking.

Vitamins and Fish Oil
- Evidence that antioxidant vitamins can prevent arthritis is lacking.
- Fish oil capsules (containing omega-3 fatty acids) may decrease pain and swelling in some people with rheumatoid arthritis.
- Fish oil for osteoarthritis cannot be recommended.

Acupuncture and Acupressure
- Acupuncture is an ancient Chinese practice. By inserting hair-fine needles into the skin along defined tracts called meridians, practitioners believe they can stimulate the flow of "qi," or vital life energy.
- Acupressure and shiatsu, a Japanese form of acupressure, use no needles. Instead intense local pressure is applied to certain points on the body.
- Although medical experts do not understand how acupuncture and acupressure work, some people experience less joint pain with these techniques.
- Recent, well-controlled trials of acupuncture for osteoarthritis of the knee suggest a benefit not only for pain relief but also with respect to function.

Magnet Therapy
- Though popular, scientific evidence of its benefit is lacking.
- No proof that one strength is better than another or that any magnet really helps.

Diet Therapy
- Efforts to find food allergies that cause arthritis have not yielded definitive results.
- The most common approach is to eliminate vegetables from the nightshade family: white potatoes, tomatoes, peppers and eggplant.
- Some people with arthritis also feel that dairy products aggravate their symptoms.
- If a patient suspects food allergies may be affecting his arthritis (for example, if symptoms become worse after eating certain foods), keep a record of what is eaten for several weeks, along with notes about arthritis symptoms.
- Eliminate from diet foods that seem to cause trouble; after a period of time, gradually reintroduce these foods one at a time, noting any change in symptoms.
- Research-based evidence on the value of this approach is lacking, but diet therapy still may be worth a try.

Exercise and Weight Control
- Exercise and weight control are among the most effective self-help measures for alleviating the symptoms of osteoarthritis (and perhaps other types of arthritis).
- The objective is to avoid obesity and improve or maintain cardiovascular fitness, range of motion and muscle tone while avoiding excessive stress or injury to joints.
- Walking, biking, cross-country skiing and swimming are the best choices. Water offers support and gentle resistance; if possible, water temperature should be 83 to 88 F or warmer.
- In one study, 33 adults with arthritis reported being better able to manage their disease symptoms and enjoyed better health after a three-month tai chi program; another study found improved balance and abdominal muscle strength.
- Other studies of moderate, low-impact exercise have suggested a benefit in arthritis symptoms.
- Guidelines for appropriate exercise may be obtained from the Arthritis Foundation (800-283-7800; www.arthritis.org).
- Consider setting up an exercise program with the advice of a physician or physical therapist. He or she can also suggest effective weight control measures if needed.

Self-Help Measures

- Many arthritis sufferers find that warm showers and baths -- particularly whirlpool baths -- are often helpful in reducing pain and stiffness, especially first thing in the morning.
- For arthritis in the hands, the simple act of squeezing a sponge in a basin or sink full of warm water provides gentle exercise and relief of stiffness.
- Warm, wet compresses, especially castor oil compresses (available where specialty health products are sold), may provide comfort for sore joints.
- Occupational therapists are trained professionals who can teach these and many more helpful techniques.

Massage

- Massage by an expert in therapeutic massage can contribute to an overall feeling of relaxation and well-being.

A Positive Outlook

- Like any person with a chronic disease, a person with osteoarthritis may be more prone to depression. They may worry about becoming increasingly unable to perform activities of daily living or doing enjoyable things.
- The capacity to adapt, cope and continue full function varies greatly among patients. Some patients feel disabled by their symptoms, but only a very small percentage will ever become severely disabled.
- A positive outlook, focusing on what the person is able to do rather than what they are unable to do, can be immensely helpful.
- Some people find that meditation and other stress-reduction techniques help them to relax and better adjust the pace of their lives to the limitations imposed by their arthritis.

The Bottom Line

- Recognize that for many unproven approaches, uncertainty about benefit and risk must be accepted before pursuing treatment.
- A particular source of concern is that the treatment may interact with another medication, something the small studies cannot predict.
- Keep in mind that herbs and supplements such as glucosamine are not regulated by the Food and Drug Administration; active ingredients, purity and quality may vary greatly.

Last updated October 14, 2005
http://www.intelihealth.com/IH/ihtIH?d=dmtContent&c=317554&p=~br,IHW|~st,9339|~r,WSIHW000|~b,*|

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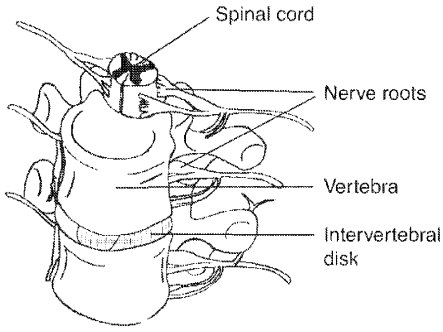
What Is Spinal Stenosis?

Fast Facts: An Easy-to-Read Series of Publications for the Public

The spine, a row of 26 bones in your back, allows you to stand up straight and bend over. The spine also protects your spinal cord from being hurt. In people with spinal stenosis, the spine is narrowed in one or more of three parts:

- The space at the center of the spine
- The canals where nerves branch out from the spine
- The space between vertebrae (the bones of the spine).

This narrowing puts pressure on the spinal cord and nerves and can cause pain.



Section of the Spine

Who Gets Spinal Stenosis?

Spinal stenosis is most common in men and women over 50 years old. Younger people who were born with a narrow spinal canal or who hurt their spines may also get spinal stenosis.

What Causes Spinal Stenosis?

Aging

Changes that occur in the spine as people get older are the most common cause of spinal stenosis. As people get older:

- The bands of tissue that support the spine may get thick and hard.
- Bones and joints may get bigger.
- Surfaces of the bones may bulge out (these are called bone spurs).

Arthritis

In some cases arthritis, a degenerative (gets worse over time) condition can cause spinal stenosis. Two forms of arthritis may affect the spine: osteoarthritis and rheumatoid arthritis.

Osteoarthritis:

- The most common form of arthritis
- Most often occurs in middle-aged and older people
- Doesn't go away
- May involve many joints in the body
- Wears away the tough tissue (cartilage) that keeps the joints in place
- Causes bone spurs and problems with joints.

U.S. Department of Health and Human Services
Public Health Service

National Institute of Arthritis and Musculoskeletal and Skin Diseases
National Institutes of Health
1 AMS Circle
Bethesda, Maryland 20892–3675

Phone: 301–495–4484;
1–877–22–NIAMS (free of charge)
TTY: 301–565–2966
Fax: 301–718–6366
E-mail: NIAMSInfo@mail.nih.gov
www.niams.nih.gov

Rheumatoid arthritis:

- Affects most people at a younger age than osteoarthritis
- Causes the soft tissues of the joints to swell and can affect the internal organs and systems
- Is not a common cause of spinal stenosis
- Can cause severe damage, especially to joints.

Inherited Conditions

Some people are born with conditions that cause spinal stenosis. For instance, some people are born with a small spinal canal. Others are born with a curved spine (scoliosis).

Other Causes

Other causes of spinal stenosis are:

- Tumors of the spine
- Injuries
- Paget's disease (a disease that affects the bones)
- Too much fluoride in the body
- Calcium deposits on the ligaments that run along the spine.

What Are the Symptoms of Spinal Stenosis?

There may be no symptoms of spinal stenosis, or symptoms may appear slowly and get worse over time. Signs of spinal stenosis include:

- Pain in the neck or back
- Numbness, weakness, cramping, or pain in the arms or legs
- Pain going down the leg
- Foot problems.

One type of spinal stenosis, cauda equine syndrome, is very serious. This type occurs when there is pressure on nerves in the lower back. Symptoms may include:

- Loss of control of the bowel or bladder
- Problems having sex
- Pain, weakness, or loss of feeling in one or both legs.

If you have any of these symptoms, you should call your doctor right away.

How Is Spinal Stenosis Diagnosed?

To diagnose spinal stenosis, your doctor will ask about your medical history and conduct a physical exam. Your doctor may also order one or more tests, such as:

- X rays

- Magnetic resonance imaging (MRI) – a test that uses radio waves to look at your spine
- Computerized axial tomography (CAT) – a series of x rays that give your doctor a detailed image of your spine
- Myelogram – a test in which the doctor injects liquid dye into your spinal column
- Bone scan – a test in which you are given a shot of radioactive substance that shows where bone is breaking down or being formed.

Who Treats Spinal Stenosis?

Because spinal stenosis has many causes and symptoms, you may require treatment from doctors who specialize in certain aspects of the condition. Based on your symptoms, your doctor may refer you to:

- Rheumatologists (doctors who treat arthritis and related disorders)
- Neurologists and neurosurgeons (doctors who treat diseases of the nervous system)
- Orthopedic surgeons (doctors who treat problems with the bones, joints, and ligaments)
- Physical therapists.

What Are Some Nonsurgical Treatments for Spinal Stenosis?

There are many nonsurgical treatments for spinal stenosis. Your doctor may prescribe:

- Medicines to reduce swelling
- Medicines to relieve pain
- Limits on your activity
- Exercises and/or physical therapy
- A brace for your lower back.

When Should Surgery Be Considered?

Your doctor will likely suggest nonsurgical treatment first unless you have:

- Symptoms that get in the way of walking
- Problems with bowel or bladder function
- Problems with your nervous system.

Your doctor will take many factors into account in deciding if surgery is right for you. These include:

- The success of nonsurgical treatments
- The extent of the pain
- Your preferences.

What Are Some Alternative Treatments for Spinal Stenosis?

Alternative treatments are those that are not part of standard treatment. For spinal stenosis, such treatments include chiropractic treatment and acupuncture. More research is needed on the value of these treatments. Your doctor may suggest alternative treatments in addition to standard treatments.

What Research Is Being Done on Spinal Stenosis?

Questions about spinal stenosis that scientists are trying to answer include:

- Which is more effective in treating spinal stenosis, surgery or other treatments?
- Can MRIs identify who should have surgery?

For More Information About Spinal Stenosis and Other Related Conditions:

National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS)
National Institutes of Health
1 AMS Circle
Bethesda, MD 20892–3675
Phone: 301–495–4484 or
877–22–NIAMS (226–4267) (free of charge)
TTY: 301–565–2966
Fax: 301–718–6366
E-mail: NIAMSInfo@mail.nih.gov
www.niams.nih.gov

The information in this publication was summarized in easy-to-read format from information in a more detailed NIAMS publication. To order the Spinal Stenosis Q&A full-text version, please contact NIAMS using the contact information above. To view the complete text or to order online, visit http://www.niams.nih.gov.

Osteoporosis

Definition

Osteoporosis is a disease marked by reduced bone strength leading to an increased risk of fractures or broken bones.

Characteristics

- 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:
    - Sloping shoulders
    - Curve in the back
    - Height loss
    - Back pain
    - Hunched posture
    - 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.

Functional Considerations

- 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.

Osteoporosis

What is Osteoporosis?

Osteoporosis (oss-tee-oh-puh-ro-sis) is a disease marked by reduced bone strength leading to an increased risk of fractures, or broken bones. Bone strength has two main features:

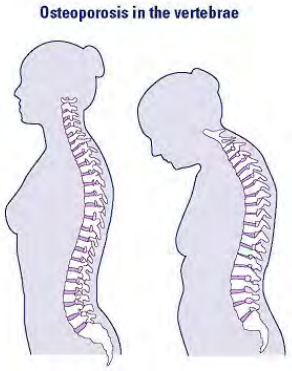
- bone mass (amount of bone) and
- bone quality.

Osteoporosis is the major underlying cause of fractures in postmenopausal women and the elderly. Fractures occur most often in bones of the hip, spine, and wrist, but any bone can be affected. Some fractures can be permanently disabling, especially when they occur in the hip.

Osteoporosis is often called a **"silent disease"** because it usually progresses without any symptoms until a fracture occurs or one or more vertebrae (bones in the spine) collapse. Collapsed vertebrae may first be felt or seen when a person develops severe back pain, loss of height, or spine malformations such as a stooped or hunched posture. Bones affected by osteoporosis may become so fragile that fractures occur spontaneously or as the result of minor bumps, falls, or normal stresses and strains such as bending, lifting, or even coughing.

What Bones Does Osteoporosis Affect?

Osteoporosis can happen to any bones, but is most common in the hip, wrist, and in the spine, also called the vertebrae (ver-tuh-bray). Vertebrae are important because these bones support the body to stand and sit upright. See the picture below.



Osteoporosis in the vertebrae can cause serious problems for women. A fracture in this area occurs from day-to-day activities like climbing stairs, lifting objects, or bending forward

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

Risk Factors for Getting Osteoporosis

Things that can increase someone's chances of developing osteoporosis include:

- being female
- small, thin body (under 127 pounds)
- family history of osteoporosis
- being postmenopausal or of an advanced age
- Caucasian or Asian race, but African American and Hispanic women are also at significant risk for developing the disease
- abnormal absence of menstrual periods or having an eating disorder, such as anorexia nervosa or bulimia that can cause menstrual periods to stop before menopause, and loss of bone tissue from too much exercise
- low testosterone levels in men
- a diet low in dairy products or other sources of calcium and vitamin D

- inactive lifestyle
- long-term use of glucocorticoids (medicines prescribed for many diseases, including arthritis, asthma, and lupus) anti-seizure medications; gonadotropin releasing hormone for treatment of endometriosis; aluminum-containing antacids; certain cancer treatments; and excessive thyroid hormone
- cigarette smoking and drinking too much alcohol

How is Osteoporosis Diagnosed?

A bone mineral density test (called a DXA) is the best way to check bone health. This test can:

- Diagnose osteoporosis
- Check bone strength
- See if treatments are making the bones stronger.

People age 65 and older, should get a bone density test.

Women between ages 60 and 64, who weighs less than 154 pounds, and doesn't take estrogen, should get a bone density test. Don't wait until age 65.

Prevention

The best way to prevent weak bones is easy – start by building strong ones. No matter how old, it is never too late to start! Building strong bones during childhood and adolescence is the best defense against getting osteoporosis later. Building strong bones at a young age will lessen the effects of the natural bone loss that starts around age 30. As a person gets older, their bones don't make new bone quickly enough to keep up with the bone loss. And after menopause, bone loss increases more quickly. But there are steps that can be taken to stop bones from becoming weak and brittle.

1. Get enough calcium each day.

Bones are made of calcium. The best way to prevent osteoporosis is to get enough calcium in the diet. A person needs enough calcium each day for strong bones throughout life. Calcium comes from foods and/or calcium pills, which can be bought at the drug store.

Daily Calcium Needs

Ages	Milligrams per day
9-18	1300
19-50	1000
51 and older	1200

Some foods to help get the needed calcium are listed below. Check the food labels for more information.

Food	Portion	Milligrams	Percent*
Plain, fat free (or low fat) yogurt	1 cup	450	45
American cheese	2 ounces	348	35
Milk (fat free or low fat)	1 cup	300	30
Orange juice with added calcium	1 cup	300	30
Broccoli, cooked or fresh	1 cup	90	10

*% Daily Value tells how much of the recommended daily amount of that nutrient is in that portion of food – these % reflect need for those of age 19-50.

2. Get enough vitamin D each day.

It is also important to get enough vitamin D, which helps the body take in calcium. Vitamin D comes through sunlight and foods like milk. 10-15 minutes of sunlight to the hands, arms, and face, two to three times a week is needed to get enough vitamin D. The amount of time depends on how sensitive the skin is to light, use of sunscreen, skin color, and pollution. Vitamin D can also be obtained by eating foods or in vitamin pills. It's measured in international units (IU).

Here's how much vitamin D needed each day.

Ages	IU per day
19-50	200
51-70	400
71 and older	600

Here are some foods to help get needed vitamin D. Check the food labels for more information.

Food	Portion	IU	Percent
Salmon, cooked	3 1/2 oz	360	90
Milk, nonfat, reduced fat, & whole, vitamin D fortified	1 cup	98	25
Egg (vitamin D is in the yolk)	1 whole	25	6
Pudding (made from mix & vitamin D fortified milk)	1/2 cup	50	10

White milk is a good source of vitamin D, most yogurts are not.

3. Eat a healthy diet.

Other nutrients, like vitamin A, vitamin C, magnesium, and zinc, as well as protein, help build strong bones too. Milk provides many of these nutrients. But these nutrients can be obtained by eating a healthy diet, including foods that have these nutrients. Some examples are lean meat, fish, green leafy vegetables, and oranges.

4. Get moving.

Being active really helps the bones by:

- slowing bone loss
- improving muscle strength
- helping balance

Do weight-bearing physical activity, which is any activity in which the body works against gravity. There are many activities that will help: walk, dance, run, climb stairs, garden, do yoga or tai chi, jog, hike, play tennis, or lift weights – it all helps!

5. Don't smoke.

Smoking raises a risk of getting osteoporosis. It damages the bones and lowers the amount of estrogen in a woman's body. Estrogen can help slow bone loss.

6. Drink alcohol moderately.

Do not drink more than one alcoholic drink per day. Alcohol can make it harder for the body to use ingested calcuim.

7. Make the home safe.
Reduce the chances of falling by making the home safer. For example, use a rubber bath mat in the shower or tub. Keep floors free from clutter. Remove throw rugs that cause tripping. Make sure there are grab bars in the bath or shower. **Fall prevention is a primary consideration**.

8. Consider taking medicines to prevent or treat bone loss.
Talk with the doctor or nurse about the risks and benefits of medicines for bone loss.

These drugs are approved for the treatment or prevention of osteoporosis:

Alendronate (Fosamax®)	• belongs to a class of drugs called biophosphonates and is approved for both prevention and treatment of osteoporosis. • used to treat bone loss from the long-term use of osteoporosis-causing medications and is used for osteoporosis in men
Risedronate (Actonel®)	• also is a bisphosphonate
Calcitonin (Miacalcin®)	• naturally occurring hormone involved in calcium regulation and bone metabolism • can be injected or taken as a nasal spray • slows bone loss and increases spinal bone density
Raloxifene (Evista®)	• a selective estrogen receptor modulator (SERM) that has many estrogen-like properties • approved for prevention and treatment of osteoporosis and can prevent bone loss at the spine, hip, and other areas of the body
Estrogen therapy (ET), or Hormone Therapy (HT)	• which have been used to treat the symptoms of menopause, also are used to prevent bone loss • might not be a good option for many women
Parathyroid Hormone or Teriparatide (Fortéo®)	• approved for the treatment of osteoporosis in postmenopausal women and men who are at high risk for a fracture • It helps new bone to form and increases bone density • Can be given as a daily injection for up to 24 months

How Can the Lactose Intolerant Patient Get Enough Calcium?

For the lactose intolerant, it can be hard to get enough calcium. Lactose intolerance means the body is not able to easily digest foods that contain lactose, or the sugar that is found in dairy products like milk. Gas, bloating, stomach cramps, diarrhea, and nausea are common symptoms. It can start at any age but often begins as people age.

Things to do:

- Eat Lactose-reduced and lactose-free products sold in food stores including milk, cheese, and ice cream
- Take special pills or liquids before eating to help digest dairy foods
- Eat foods that have calcium added (fortified), like some cereals and orange juice
- Think about taking calcium pills

Osteoporosis and Quality of Life

Aside from its effects on the bones, osteoporosis can change life in many other ways. Osteoporosis affects each person differently and to different degrees. For example, people with a single fracture and people who have had multiple fractures do not face the same challenges. The particular site of a fracture (hip, spine, etc.) may also influence a person's life in different ways. The effects of osteoporosis on quality of life can include:

- Anxiety and depression
- Reduced self-image
- Limitations in the ability to work and enjoy leisure activities
- Acute or chronic pain

- Difficulties in performing the activities of daily life
- Loss of independence
- Changes in relationships with family and friends.

Men and Osteoporosis

Before the 1990s, we used to think only women got osteoporosis. Now we know that men also have to worry about weak bones. In fact, one in four men over age 50 will suffer a fracture caused by osteoporosis. But four fifths of Americans over the age of 50 who have osteoporosis are women. They are more likely than men to develop osteoporosis because of the loss of estrogen at menopause. Estrogen blocks or slows down bone loss.

Recommended Calcium and Vitamin D Intakes3

Age	Calcium (milligrams)	Vitamin D (International Units)
Infants:		
Birth–6 months	210	200
6 months–1 year	270	200
Children/Young Adults:		
1–3 years	500	200
4–8 years	800	200
9–18 years	1,300	200
Adult Women and Men:		
9–18 years	1,000	200
51–70 years	1,200	400
Over 70 years	1,200	600

Pregnant or Nursing Women: Note that the recommended levels for women 19-50 years are the same as those for women of the same age who are not pregnant or nursing: there are no different recommendations for pregnancy or breastfeeding. Women under 18 should follow the age guidelines.

18 years or younger	1,300	200
19–50 years	1,000	200

[3] Food and Nutrition Board, Institute of Medicine, National Academy of Sciences, 1997

Adapted (10/2012) from what is osteoporosis, http://www.4woman.gov/faq/osteopor.htm Updated: August 2011 and NIH Pub. No. 07-5158, the National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS), a part of the Department of Health and Human Services' National Institutes of Health (NIH) www.niams.nih.gov/bone

19: Parkinson's Disease (PD)

Parkinson's Disease (PD)

Definition

PD is a degenerative disorder of the central nervous system that often impairs the sufferer's motor skills and speech.

Characteristics

- The **four primary symptoms** of PD are:
  - 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
- **Other symptoms** may include:
  - depression and other emotional changes
  - difficulty in swallowing, chewing, and speaking
  - urinary problems or constipation
  - skin problems
  - 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

Functional Considerations

- 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.

Parkinson's Disease

What is Parkinson's Disease?

Parkinson's disease (PD) belongs to a group of conditions called motor system disorders, which are the result of the loss of dopamine-producing brain cells.

- 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.
- Although some PD cases appear to be hereditary, and a few can be traced to specific genetic mutations, most cases are sporadic — that is, the disease does not seem to run in families.
- 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.

What Causes the Disease?

Dopamine- Parkinson's disease occurs when nerve cells, or neurons, in an area of the brain known as the substantia nigra die or become impaired. Normally, these neurons produce an important brain chemical known as dopamine. Dopamine is a chemical messenger responsible for transmitting signals between the substantia nigra and the next "relay station" of the brain, the corpus striatum, to produce smooth, purposeful movement. Loss of dopamine results in abnormal nerve firing patterns within the brain that cause impaired movement. Studies have shown that most Parkinson's patients have lost 60 to 80 percent or more of the dopamine-producing cells in the substantia nigra by the time symptoms appear.

Norepinephrine - Recent studies have shown that people with PD also have loss of the nerve endings that produce the neurotransmitter norepinephrine. Norepinephrine, which is closely related to dopamine, is the main chemical messenger of the sympathetic nervous system, the part of the nervous system that controls many automatic functions of the body, such as pulse and blood pressure. The loss of norepinephrine might help explain several of the non-motor features seen in PD, including fatigue and abnormalities of blood pressure regulation.

Lewy bodies - Many brain cells of people with PD contain Lewy bodies – unusual deposits or clumps of the proteins. Researchers do not yet know why Lewy bodies form or what role they play in development of the disease. The clumps may prevent the cell from functioning normally, or they may actually be helpful, perhaps by keeping harmful proteins "locked up" so that the cells can function.

Who Gets Parkinson's Disease?

PD strikes about 50 percent more men than women, but the reasons for this discrepancy are unclear. While it occurs in people throughout the world, a number of studies have found a higher incidence in developed countries, possibly because of increased exposure to pesticides or other toxins in those countries. Other studies have found an increased risk in people who live in rural areas and in those who work in certain professions, although the studies to date are not conclusive and the reasons for the apparent risks are not clear.

One clear risk factor for PD is age. The average age of onset is 60 years, and the incidence rises significantly with increasing age. However, about 5 to 10 percent of people with PD have "early-onset" disease that begins before the age of 50. Early-onset forms of the disease are often inherited, though not always, and some have been linked to specific gene mutations. People with one or more close relatives who have PD have an increased risk of developing the disease themselves, but the total risk is still just 2 to 5 percent unless the family has a known gene mutation for the disease. An estimated 15 to 25 percent of people with PD have a known relative with the disease.

What are the Symptoms of the Disease?

Early symptoms of PD:

- are subtle and occur gradually
- people may feel mild tremors or have difficulty getting out of a chair
- may notice that they speak too softly
- that their handwriting is slow and looks cramped or small
- may lose track of a word or thought
- may feel tired, irritable, or depressed for no apparent reason
- person's face lacks expression and animation (known as "masked face")
- person seems stiff, unsteady, or unusually slow

This very early period may last a long time before the more classic and obvious symptoms appear. Friends or family members may be the first to notice changes in someone with early PD.

As the disease progresses,

- shaking or tremor may begin to interfere with daily activities.
- may not be able to hold utensils steady
- may find that the shaking makes reading a newspaper difficult.
- tremor is usually the symptom that causes people to seek medical help
- "parkinsonian gait" that includes a tendency to lean forward, small quick steps as if hurrying forward (called festination), and reduced swinging of the arms
- may have trouble initiating movement (start hesitation)
- may stop suddenly as they walk (freezing).

PD does not affect everyone the same way, and the rate of progression differs among patients. Tremor is the major symptom for some patients, while for others; tremor is nonexistent or very minor.

PD symptoms often begin on one side of the body. However, as it progresses, the disease eventually affects both sides. Even after the disease involves both sides of the body, the symptoms are often less severe on one side than on the other.

The **four primary symptoms** of PD are:

Tremor	• has a characteristic appearance • typically, takes the form of a rhythmic back-and-forth motion at a rate of 4-6 beats per second • may involve the thumb and forefinger and appear as a "pill rolling" tremor often begins in a hand, although sometimes a foot or the jaw is affected first • is most obvious when the hand is at rest or when a person is under stress the shaking may become more pronounced a few seconds after the hands are rested on a table • usually disappears during sleep or improves with intentional movement
Rigidity (a resistance to movement)	• affects most people • The muscles remain constantly tensed and contracted so that the person aches or feels stiff or weak • rigidity becomes obvious when another person tries to move the patient's arm, which will move only in ratchet-like or short, jerky movements known as "cogwheel" rigidity
Bradykinesia (slowing down and loss of spontaneous and automatic movement)	• particularly frustrating because it may make simple tasks somewhat difficult • person cannot rapidly perform routine movements • activities once performed quickly and easily — such as washing or dressing — may take several hours
Postural instability (impaired balance)	• causes patients to fall easily • may develop a stooped posture in which the head is bowed and the shoulders are drooped

A number of **other symptoms may accompany PD**. Some are minor; others are not. Many can be treated with medication or physical therapy. No one can predict which symptoms will affect an individual patient, and the intensity of the symptoms varies from person to person.

Depression	• common problem and may appear early in the course of the disease, even before other symptoms are noticed	• may be successfully treated with antidepressant medications
Emotional changes	• some people become fearful and insecure • may not want to travel, go to parties, or socialize with friends. • may lose their motivation and become dependent on family members • may become irritable or uncharacteristically pessimistic	

Difficulty with swallowing and chewing	• muscles used in swallowing may work less efficiently in later stages of the disease • in these cases, food and saliva may collect in the mouth and back of the throat, which can result in choking or drooling • these problems also may make it difficult to get adequate nutrition	• Speech-language therapists, occupational therapists, and dieticians can often help with these problems
Speech changes	• about half of all patients have problems with speech. • may speak too softly or in a monotone, hesitate before speaking, slur or repeat their words, or speak too fast.	• A speech therapist may be able to help patients reduce some of these problems
Urinary problems	• bladder and bowel problems can occur due to the improper functioning of the autonomic nervous system, which is responsible for regulating smooth muscle activity • Some people may become incontinent, while others have trouble urinating	• May improve with medication treatment for MD
Constipation	• may occur because the intestinal tract operates more slowly • can also be caused by inactivity, eating a poor diet, or drinking too little fluid • medications used to treat PD also can contribute to constipation • can be a persistent problem and, in rare cases, can be serious enough to require hospitalization	
Skin problems	• common for the skin on the face to become very oily, particularly on the forehead and at the sides of the nose • scalp may become oily too, resulting in dandruff • in other cases, the skin can become very dry • another common symptom is excessive sweating,	• standard treatments for skin problems can help. • excessive sweating is usually controllable with medications used for PD

Sleep problems	• common and include:
	  ○ difficulty staying asleep at night
	  ○ restless sleep
	  ○ nightmares
	  ○ emotional dreams
	  ○ drowsiness or sudden sleep onset during the day.
	• patients with PD should never take over-the-counter sleep aids without consulting their physicians	

Dementia or other cognitive problems	• some, but not all, people may develop memory problems and slow thinking • cognitive problems may become more severe, leading to a condition called Parkinson's dementia late in the course of the disease • dementia may affect memory, social judgment, language, reasoning, or other mental skills	• currently there is no way to halt PD dementia, but studies have shown that a drug called rivastigmine may slightly reduce the symptoms. • the drug donepezil also can reduce behavioral symptoms in some people with PD-related dementia
Orthostatic hypotension (a sudden drop in blood pressure when a person stands up from a lying-down position)	• may cause dizziness, lightheadedness, and, in extreme cases, loss of balance or fainting • this problem results from a loss of nerve endings in the sympathetic nervous system that controls heart rate, blood pressure, and other automatic functions in the body • medications used to treat PD also may contribute to this symptom	• may be helped by increasing salt intake, reducing antihypertension drugs, or prescribing medications such as fludrocortisone
Muscle cramps and dystonia	• muscle cramps seen especially in the legs and toes • dystonia — sustained muscle contractions that cause forced or twisted positions is often caused by fluctuations in the body's level of dopamine	• Massage, stretching, and applying heat may help with these cramps • Dystonia can usually be relieved or reduced by adjusting the person's medications
Pain	• aching muscles and joints because of the rigidity and abnormal postures often associated with the disease • may develop pain due to compression of nerve roots or dystonia-related muscle spasms • in rare cases may develop unexplained burning, stabbing sensations- called "central pain," originates in the brain	• Treatment with levodopa and other dopaminergic drugs often alleviates these pains to some extent • Certain exercises also may help • Dopaminergic drugs, opiates, antidepressant, and other types of drugs may all be used to treat "central pain"
Fatigue and loss of energy	• fatigue, especially late in the day • Fatigue may be associated with depression or sleep disorders, but it also may result from muscle stress or from overdoing activity when the person feels well • may result from akinesia – trouble initiating or carrying out movement	• Exercise, good sleep habits, staying mentally active, and not forcing too many activities in a short time may help to alleviate fatigue

Sexual dysfunction	• often causes erectile dysfunction because of its effects on nerve signals from the brain or because of poor blood circulation • depression or use of antidepressant medication also may cause decreased sex drive and other problems	• These problems are often treatable

How is Parkinson's Disease Diagnosed?

There are currently no blood or laboratory tests that have been proven to help in diagnosing sporadic PD. Therefore the diagnosis is based on medical history and a neurological examination. The disease can be difficult to diagnose accurately. Doctors may sometimes request brain scans or laboratory tests in order to rule out other diseases.

What is the Prognosis?

PD is not by itself a fatal disease, but it does get worse with time. The average life expectancy of a PD patient is generally the same as for people who do not have the disease. However, in the late stages of the disease, PD may cause complications such as choking, pneumonia, and falls that can lead to death.

One commonly used system for describing how the symptoms of PD progress is called the Hoehn and Yahr scale.

Hoehn and Yahr Staging of Parkinson's Disease

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

With appropriate treatment, most people with PD can live productive lives for many years after diagnosis.

How is the Disease Treated?

At present, there is no cure for PD. But medications or surgery can sometimes provide dramatic relief from the symptoms.

Drug Treatments

Medications for PD fall into three categories:

- The first category includes **drugs that work directly or indirectly to increase the level of dopamine in the brain**. The most common drugs for PD are dopamine precursors – substances such as levodopa that cross the blood-brain barrier and are then changed into dopamine. Other drugs mimic dopamine or prevent or slow its breakdown.

	Characteristics	Side effects
Levodopa	• Cornerstone of therapy for PD • Nerve cells can use levodopa to make dopamine and replenish the brain's dwindling supply • Levodopa usually helps most with bradykinesia and rigidity. • Problems with balance and other non-motor symptoms may not be alleviated at all. • People often see dramatic improvement in their symptoms after starting levodopa therapy. • However, they may need to increase the dose gradually for maximum benefit • **Never** stop taking levodopa without their physician's knowledge or consent because rapidly withdrawing the drug can have potentially serious side effects, such as immobility or difficulty breathing	• Most common initial side effects include nausea, vomiting, low blood pressure, and restlessness. Can cause drowsiness or sudden sleep onset, which can make driving and other activities dangerous. • Long-term use of levodopa may cause hallucinations and psychosis. • Nausea and vomiting are greatly reduced by combining levodopa and carbidopa, which enhances the effectiveness of a lower dose. • Dyskinesias, or involuntary movements such as twitching, twisting, and writhing, commonly develop in people who take large doses of levodopa over an extended period. • After long-term use ↓effectiveness, and coverage time may lessen causing "breakthrough symptoms"
Dopamine agonists	• mimic the role of dopamine in the brain • include bromocriptine, apomorphine, pramipexole, and ropinirole • can be given alone or in conjunction with levodopa • generally less effective than levodopa in controlling rigidity and bradykinesia • May be used to lessen long-term effects of levodopa	• Many of the potential side effects are similar to those associated with the use of levodopa, including drowsiness, sudden sleep onset, hallucinations, confusion, dyskinesias, edema, nightmares, and vomiting. • Can cause compulsive behavior, such as an uncontrollable desire to gamble, hypersexuality, or compulsive shopping. • Bromocriptine can also cause fibrosis, or a buildup of fibrous tissue, in the heart valves or the chest cavity. Fibrosis usually goes away once the drugs are stopped.
MAO-B inhibitors	• Inhibit the enzyme monoamine oxidase B which breaks down dopamine in the brain • Cause dopamine to accumulate in surviving nerve cells and reduce the symptoms of PD • Selegiline (deprenyl), is an MAO-B inhibitor that is commonly used	• Selegiline is usually well-tolerated, although side effects may include nausea, orthostatic hypotension, or insomnia. • It should not be taken with the antidepressant fluoxetine or the sedative mepiridine, because combining seligiline with these drugs can be harmful.

COMT inhibitors	• Stands for catechol-O-methyltransferase, another enzyme that helps to break down dopamine • Two are approved to treat PD in the United States: entacapone and tolcapone • Usually make it possible to reduce the person's dose of levodopa	• The most common side effect is diarrhea. • The drugs may also cause nausea, sleep disturbances, dizziness, urine discoloration, abdominal pain, low blood pressure, or hallucinations. • In a few rare cases, tolcapone has caused severe liver disease.
Amantadine	• Antiviral drug can help reduce symptoms of PD and levodopa-induced dyskinesia • After several months, amantadine's effectiveness wears off in up to half of the patients taking it	• side effects may include insomnia, mottled skin, edema, agitation, or hallucinations. • Researchers are not certain how amantadine works in PD, but it may increase the effects of dopamine.

- The second category of PD drugs **affects other neurotransmitters in the body in order to ease some of the symptoms of the disease**. For example, anticholinergic drugs interfere with production or uptake of the neurotransmitter acetylcholine. These drugs help to reduce tremors and muscle stiffness, which can result from having more acetylcholine than dopamine.

Anticholinergics	• include trihexyphenidyl, benztropine, and ethopropazine • decrease the activity of the neurotransmitter acetylcholine and help to reduce tremors and muscle rigidity • Only about half the patients who receive anticholinergics are helped by it, usually for a brief period and with only a 30 percent improvement	• Side effects may include dry mouth, constipation, urinary retention, hallucinations, memory loss, blurred vision, and confusion

- The third category of drugs prescribed for PD includes **medications that help control the non-motor symptoms of the disease**, that is, the symptoms that don't affect movement. For example, people with PD-related depression may be prescribed antidepressants.

Surgery

Treating PD with surgery was once a common practice. But after the discovery of levodopa, surgery was restricted to only a few cases. Studies in the past few decades have led to great improvements in surgical techniques, and surgery is again being used in people with advanced PD for whom drug therapy is no longer sufficient.

Pallidotomy and Thalamotomy. The earliest types of surgery for PD involved selectively destroying specific parts of the brain that contribute to the symptoms of the disease. Investigators have now greatly refined the use of these procedures. The most common of these procedures is called pallidotomy. In this procedure, a surgeon selectively destroys a portion of the brain to improve symptoms of tremor, rigidity, and bradykinesia. Some studies have also found that pallidotomy can improve gait and balance and reduce the amount of levodopa patients require, thus reducing drug-induced dyskinesias and dystonia. A related procedure, called thalamotomy, involves surgically destroying part of the brain's thalamus. Thalamotomy is useful primarily to reduce tremor.

Because these procedures cause permanent destruction of brain tissue, they have largely been replaced by deep brain stimulation for treatment of PD.

Deep Brain Stimulation. Deep brain stimulation, or DBS, uses an electrode surgically implanted into part of the brain. The electrodes are connected by a wire under the skin to a small electrical device called a pulse generator that is implanted in the chest beneath the collarbone. The pulse generator and electrodes painlessly stimulate the brain in a way that helps to stop many of the symptoms of PD. DBS has now been approved by the U.S. Food and Drug Administration, and it is widely used as a treatment for PD. DBS can be used on one or both sides of the brain.

One advantage of DBS compared to pallidotomy and thalamotomy is that the electrical current can be turned off using a handheld device. The pulse generator also can be externally programmed.

How Can People Cope with Parkinson's Disease?

While PD usually progresses slowly, eventually the most basic daily routines may be affected — from socializing with friends and enjoying normal relationships with family members to earning a living and taking care of a home. These changes can be difficult to accept. Support groups can help people cope with the disease emotionally. These groups can also provide valuable information, advice, and experience to help people with PD, their families, and their caregivers deal with a wide range of issues, including locating doctors familiar with the disease and coping with physical limitations. A list of national organizations that can help patients locate support groups in their communities appears at the end of this brochure. Individual or family counseling also may help people find ways to cope with PD.

People with PD also can benefit from being proactive and finding out as much as possible about the disease in order to alleviate fear of the unknown and to take a positive role in maintaining their health. Many people with PD continue to work either full- or part-time, although eventually they may need to adjust their schedule and working environment to cope with the disease.

Glossary of Terms

- **anticholinergic drugs** — drugs that interfere with production or uptake of the neurotransmitter acetylcholine.
- **akinesia —** trouble initiating or carrying out movements.
- **bradykinesia** — gradual loss of spontaneous movement.
- **corpus striatum —** a part of the brain that helps regulate motor activities.
- **deep brain stimulation —** a treatment that uses an electrode implanted into part of the brain to stimulate it in a way that temporarily inactivates some of the signals it produces.
- **dementia** — loss of intellectual abilities.
- **dopamine** — a chemical messenger, deficient in the brains of PD patients, that transmits impulses from one nerve cell to another.
- **dyskinesias** — abnormal involuntary twisting and writhing movements that can result from long-term use of high doses of levodopa.
- **dysphagia** — difficulty swallowing.
- **festination** — a symptom characterized by small, quick, forward steps.
- **myoclonus** — muscular jerks.
- **on-off effect** — a change in the patient's condition, with sometimes rapid fluctuations between uncontrolled movements and normal movement, usually occurring after long-term use of levodopa and probably caused by changes in the ability to respond to this drug.
- **orthostatic hypotension** — a sudden drop in blood pressure when a person stands up from a lying-down position. It may cause dizziness, lightheadedness, and, in extreme cases, loss of balance or fainting.
- **pallidotomy** — a surgical procedure in which a part of the brain called the globus pallidus is lesioned in order to improve symptoms of tremor, rigidity, and bradykinesia.
- **parkinsonian gait** — a characteristic way of walking that includes a tendency to lean forward; small, quick steps as if hurrying forward (called festination); and reduced swinging of the arms.
- **parkinsonism —** a term referring to a group of conditions that are characterized by four typical symptoms— tremor, rigidity, postural instability, and bradykinesia.
- **"Parkinson's-plus"** — a group of diseases that includes corticobasal degeneration, progressive supranuclear palsy, and multiple system atrophy. These diseases cause symptoms like those of PD in addition to other symptoms.
- **postural instability** — impaired balance that causes a tendency to lean forward or backward and to fall easily.
- **rigidity** — a symptom of the disease in which muscles feel stiff and display resistance to movement even when another person tries to move the affected part of the body, such as an arm.
- **secondary parkinsonism** — any condition with symptoms that resemble those of PD but which result from other causes.
- **substantia nigra —** movement-control center in the brain where loss of dopamine-producing nerve cells triggers the symptoms of PD; substantia nigra means "black substance," so called because the cells in this area are dark.
- **thalamotomy** — a procedure in which a portion of the brain's thalamus is surgically destroyed, usually reducing tremors.
- **tremor** — shakiness or trembling, often in a hand, which in PD is usually most apparent when the affected part is at rest.
- **wearing-off effect —** the tendency, following long-term levodopa treatment, for each dose of the drug to be effective for shorter and shorter periods.

Adapted (8-07) from: "Parkinson's Disease: Hope Through Research," NINDS. Publication date June 22, 2007. NIH Publication No. 06-139

20: Peripheral Arterial Disease (PAD)

Peripheral Arterial Disease (PAD)

Definition

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.

Characteristics

- **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:
    - Kidney disease
    - High blood pressure or a family history of it
    - A high cholesterol level or a family history of it
    - Heart disease or a family history of it
- **A family history of stroke**
- **Age** – risk increases with age

Functional Considerations

- 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.

National Heart Lung and Blood Institute

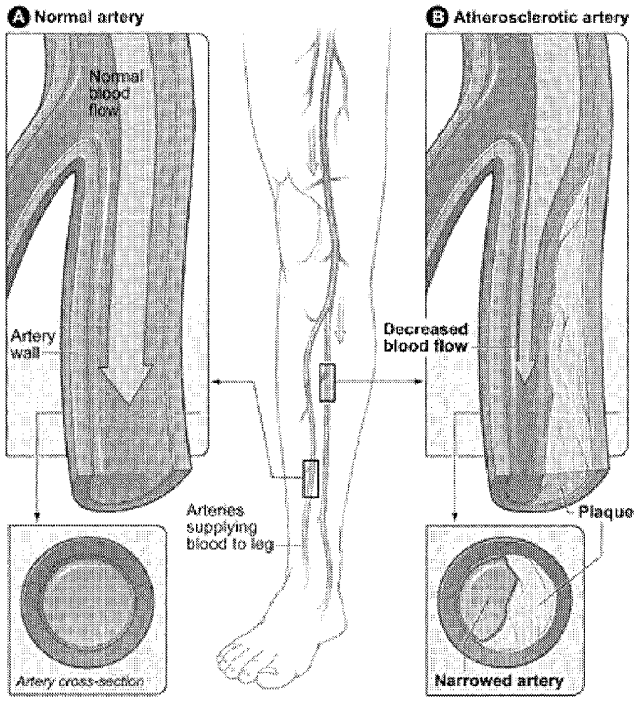
Peripheral Arterial Disease

Peripheral arterial disease (PAD) occurs when a fatty material called plaque (plak) 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.

The buildup of plaque on the artery walls is called atherosclerosis, or hardening of the arteries. Atherosclerosis causes the arteries to narrow or become blocked, which can reduce or block blood flow. **PAD most commonly affects blood flow to the legs.**

Blocked blood flow can cause pain and numbness. It also can increase a person's chance of getting an infection, and it can make it difficult for the person's body to fight the infection. If severe enough, blocked blood flow can cause tissue death (gangrene). **PAD is the leading cause of leg amputation**.

The illustration shows the location of leg arteries that can be affected by peripheral arterial disease. Figure A shows a normal artery with normal blood flow (the inset image shows a cross-section of the normal artery). Figure B shows an artery with plaque buildup, which is partially blocking blood flow (the inset image shows the degree to which the artery is blocked).



Important General Information

Atherosclerosis can affect arteries anywhere in the body, including the arteries that carry blood to the heart and brain.

Coronary artery disease (CAD) - When atherosclerosis affects the arteries of the heart. CAD can cause a heart attack. If atherosclerosis is in the limbs, it also is likely to be in the coronary arteries.
Carotid artery disease - When atherosclerosis affects the major arteries supplying the brain, it is called carotid artery disease. This can cause a stroke.

Peripheral Arterial Disease (PAD) - Atherosclerosis in the arteries that supply blood to the limbs, especially the legs. PAD can impair physical health and diminish the ability to walk.

In the advanced stages of PAD, blood flow to one or both legs can be completely or mostly blocked. This is known as **chronic critical limb ischemia (CLI)**. A very severe blockage in the legs and feet means that the legs do not receive the oxygen or nutrition needed for cellular or skin growth and repair. 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**.

Outlook

A person with PAD has a six to seven times greater risk of CAD, heart attack, stroke, or transient ischemic attack ("mini stroke") than the rest of the population. If a person has heart disease, he or she has a 1 in 3 chance of having blocked arteries in the legs. Early diagnosis and treatment of PAD, including screening high-risk individuals, are important to prevent disability and save lives. PAD treatment may stop the disease from progressing and reduce the risk of heart attack, heart disease, and stroke.

Although PAD is serious, it is treatable. The buildup of plaque in the arteries can often be stopped or reversed with dietary changes, exercise, and efforts to lower high cholesterol levels and high blood pressure. In some patients, blood flow in the vessels may be improved by medicines or surgery.

Other Names for Peripheral Arterial Disease

- Atherosclerotic peripheral arterial disease
- Peripheral vascular disease (PVD)
- Vascular disease
- Hardening of the arteries
- Claudication
- Poor circulation
- Leg cramps from poor circulation

Who is At Risk for Peripheral Arterial Disease?

Peripheral arterial disease (PAD) affects 8 to 12 million people in the United States. An estimated 5 percent of U.S. adults over age 50 have PAD. Among adults age 65 and older, 12 to 20 percent may have PAD.

Major risk factors for developing PAD include:

- **Smoking**. Smoking is more closely related to developing PAD than any other risk factor.
    - Smoking increases the risk of developing PAD three to five times.
    - On average, smokers who develop PAD experience symptoms 10 years earlier than nonsmokers who develop PAD.
    - Stopping smoking will slow the progress of PAD.
    - Smoking even one or two cigarettes daily can interfere with the treatment for PAD.
    - Smokers and diabetics have the greatest risk of complications from PAD, including gangrene in the leg from decreased blood flow.
- **Chronic or serious illnesses, such as diabetes**. One in three people over age 50 with diabetes is likely to have PAD. Anyone over age 50 with diabetes should be screened for PAD.
- **Other diseases and conditions**, such as:
    - Kidney disease
    - High blood pressure or a family history of it
    - A high cholesterol level or a family history of it
    - Heart disease or a family history of it
- **A family history of stroke**
- **Age.** Men who are older than age 50 and women who are older than age 55 are at higher risk for PAD.

What are the Signs and Symptoms of Peripheral Arterial Disease?

At least half of the people who have peripheral arterial disease (PAD) don't have any signs or symptoms of the disease.

If they are present, the typical signs and symptoms of the disease include:

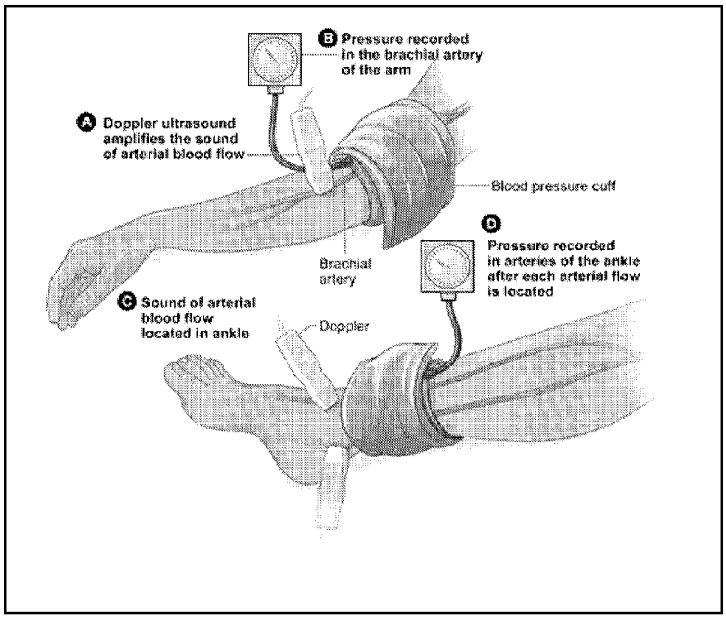
- **Claudication**—fatigue, heaviness, tiredness, cramping in the leg muscles (buttocks, thigh, or calf) that occurs during activity such as walking or climbing stairs. This pain or discomfort goes away once the activity is stopped and during rest. Many people do not report this problem to their health care providers because they think it is a natural part of aging or due to some other cause.
- **Pain in the legs and/or feet** that disturbs sleep.
- **Sores or wounds on toes, feet, or legs** that heal slowly, poorly, or not at all.
- **Color changes in the skin of the feet**, including paleness or blueness.
- **A lower temperature in one** leg compared to the other leg.
- **Poor nail growth and decreased hair growth on toes and legs**.

How is Peripheral Arterial Disease Diagnosed?

Peripheral arterial disease (PAD) is diagnosed based on general medical and family history, history of leg or heart problems, personal risk factors, a physical exam, and test results. An accurate diagnosis is critical, because people with PAD face a six to seven times higher risk of heart disease or stroke than the rest of the population. PAD is often diagnosed after symptoms are reported. If you have PAD, your doctor also may want to look for signs of coronary artery disease (CAD).

Diagnostic Tests and Procedures

A simple test called an **ankle-brachial index (ABI)** can be used to diagnose PAD. The ABI compares blood pressure in the ankle with blood pressure in the arm to see how well blood is flowing. A normal ABI is 1.0 or greater (with a range of 0.90 to 1.30). The test takes about 10–15 minutes to measure both arms and both ankles. It can help the doctor find out if PAD is affecting the legs, but it will not identify which blood vessels are blocked. The ABI can be performed yearly if necessary to see if the disease is getting worse.



The illustration shows the ankle-brachial index (ABI) test. The ABI gives the ratio of the systolic blood pressure in the ankle to the systolic blood pressure in the brachial artery of the arm.

A **Doppler ultrasound** is a test that uses sound waves to tell whether a blood vessel is open or blocked. This test uses a blood pressure cuff and special device to measure blood flow in the veins and arteries in the arms and legs. The Doppler ultrasound can help to determine the level and degree of PAD.

A **treadmill test** will provide more information on the severity of the symptoms and the level of exercise that provokes symptoms. For this test, the patient walks on a treadmill, which will help identify any difficulties that they may have during normal walking.

A **magnetic resonance angiogram (MRA)** uses radio wave energy to take pictures of blood vessels inside the body. MRA is a type of magnetic resonance imaging (MRI) scan. An MRA can detect problems that may cause reduced blood flow in the blood vessels. It can determine the location and degree of blockage. A patient with a pacemaker, prosthetic joint, stent, surgical clips, mechanical heart valve, or other metallic devices in his or her body might not be eligible for an MRA depending on the type of metallic device.

An **arteriogram is** a "road map" of the arteries used to pinpoint the exact location of the blockage in a limb. An x-ray is taken after injecting dye through a needle or catheter into an artery. When the dye is injected, the patient may feel mildly flushed. The pictures from the x-ray can determine the location, type, and extent of the blockage. Some hospitals are using a newer method that uses tiny ultrasound cameras to take pictures inside the blood vessel.

Blood tests may be done to check the patient's blood sugar level to screen for diabetes. Blood tests also may be used to check the patient's cholesterol levels.

How is Peripheral Arterial Disease Treated?

Goals of Treatment

The **overall goals** for treating peripheral arterial disease (PAD) are to:

1. reduce symptoms,
2. improve quality of life, and
3. prevent complications.

Treatment is based on symptoms, risk factors, physical exam results, and diagnostic tests.

Specific Types of Treatment

Lifestyle Changes – Treatment often includes making long-lasting lifestyle changes, such as:

Quitting smoking	• Smoking increases the risk of developing PAD three to five times. • The risk for coronary artery disease (CAD) decreases rapidly if the smoker quits. • The risk for CAD decreases 40 percent within 5 years of stopping smoking.
Lowering blood pressure	• Lowering blood pressure can help to avoid the risk of stroke, heart attack, congestive heart failure, and kidney disease.
Lowering high cholesterol levels	• Lowering cholesterol levels can delay or even reverse the buildup of plaque in the arteries.
Lowering blood glucose levels if you have diabetes	• A hemoglobin A1C test—a test that gives an estimate of how well blood sugar has been controlled over the past 3 months—may be performed.
Exercise therapy	• Should be monitored by a doctor
Healthy diet	• Low-saturated fat, low-cholesterol diet, and eat foods with less salt, total fat. • Eat more fruits, vegetables, and low-fat dairy products.
Weight loss	• If you are overweight or obese, work with your doctor to develop a reasonable weight-loss plan.

Medicines

Medicines may be prescribed to:

- **Lower high cholesterol levels** - may include statins, such as lovastatin, simvastatin, pravastatin, fluvastatin, and atorvastatin. Other medicines may include ezetimibe, gemfibrozil, and certain binding agents.
- **Lower high blood pressure** - should aim for a blood pressure lower than 130/80 mmHg. Many medicines are available to lower blood pressure, such as angiotensin-converting enzyme (ACE) inhibitors, angiotensin receptor blockers (ARBs), beta-blockers, diuretics ("water pills"), and calcium channel blockers.
- **Thin the blood to prevent clots** from forming due to low blood flow – such as heparin or coumadin
- **Dissolve blood clots** - antiplatelet drugs such as clopidogrel (Plavix®) and aspirin may be prescribed
- **Help improve pain in the legs** that is the result of walking or climbing stairs (claudication) – such as pentoxifylline (Trental®) or cilostazol (Pletal®)

Surgeries or Special Procedures

Surgery may be necessary if blood flow in a limb is completely or almost completely blocked. In **bypass grafting surgery**, the doctor uses a blood vessel from another part of your body or a tube made of synthetic (man-made) material to make a graft. This graft bypasses the blockage in the artery, allowing blood to flow around it. Surgery does not cure PAD, but it may increase blood flow to the limb.

Angioplasty may be performed to restore blood flow through a narrowed or blocked artery. During the procedure, a thin tube (catheter) is inserted into a blocked artery and a small balloon on the tip of the catheter is inflated. When the balloon is inflated, plaque is pushed against the artery walls. This causes the artery to widen, restoring blood flow. A **stent**, a tiny mesh tube that looks like a small spring, is now used in most angioplasties. Some stents are coated with medicine to help prevent the artery from closing again.

How Can Peripheral Arterial Disease be Prevented?

There are a number of ways to try to prevent peripheral arterial disease (PAD). If you are a smoker, quit smoking. On average, smokers who develop PAD experience symptoms 10 years earlier than nonsmokers who develop PAD. Work to control your blood pressure, cholesterol, and glucose levels. Talk with your doctor about beginning a supervised exercise therapy program. If you are overweight or obese, work with your doctor to develop a reasonable weight-loss plan. Finally, follow a low-fat, low-cholesterol diet and eat more fruits and vegetables.

Living with Peripheral Arterial Disease

Ongoing Health Care Needs

Peripheral arterial disease (PAD) can be treated and controlled.

Intermittent claudication	Try to take a break and allow the pain to ease before walking again. Over time, this should increase the distance that you can walk without pain.
Foot inspection	Check feet and toes regularly for sores or any possible infection. Maintain good foot hygiene and have professional medical treatment for corns, bunions, or calluses. Wear comfortable shoes that fit well.
Keep tract of important lab values	Be sure to keep your blood pressure, cholesterol, and blood sugar (if diabetic) within normal ranges.

Treatment should decrease pain when walking and allow you to walk longer distances without discomfort. There should be less painful cramping of leg muscles. There may be improvement in the skin's appearance and improvement in ulcers on your legs and feet.

Support Groups

The Peripheral Arterial Disease Coalition is an alliance of leading health organizations, vascular health professional organizations, and Government agencies that have united to raise public and health professional awareness about lower extremity PAD. The coalition's Patient Education Workgroup is developing patient education tools.

The Amputee Coalition of America and National Limb Loss Information Center provide support for people with limb loss.

Long-Term Care

For severe cases of chronic clinical limb ischemia (CLI), a patient may be bed-bound and need total supportive care. CLI is a severe blockage of the arteries that seriously decreases blood flow to the hands, legs, and feet. People with severe CLI may experience burning pain in the affected limb, and they can suffer from wounds that do not heal or from tissue death (gangrene).

Revised (8-07) from: http://www.nhlbi.nih.gov/health/dci/Diseases/pad/pad_all.html, NHLBI, Publication Date: June 2006.