

### OTHER DISORDERS

#### BRONCHITIS

What is Bronchitis?

Bronchitis is a respiratory disease in which the mucus membrane in the lungs' bronchial passages becomes inflamed.

As the irritated membrane swells and grows thicker, it narrows or shuts off the tiny airways in the lungs, resulting in coughing spells that may be accompanied by phlegm and breathlessness.

The disease comes in two forms: acute (lasting from one to three weeks) and chronic (lasting at least 3 months of the year for two years in a row).

People with asthma may also have asthmatic bronchitis, inflammation of the lining of the bronchial tubes.

Acute bronchitis may be responsible for the hacking cough and phlegm production that sometime accompany an upper respiratory infection. In most cases, the infection is viral in origin, but sometimes it's caused by bacteria.

If you are otherwise in good health, the mucus membrane should return to normal after you've recovered from the initial lung infection, which usually lasts for several days.

If you continue smoking, the damage to these cilia prevent them from functioning properly, thus increasing your chances of developing chronic bronchitis. In some heavy smokers, the mucus membrane lining the airways stays inflamed and the cilia eventually stop functioning altogether. Clogged with mucus, the lungs are then vulnerable to viral and bacterial infections, which over time distort and permanently damage the lungs' airways. This permanent condition is called COPD (chronic obstructive pulmonary disease). Your doctor can perform a breathing test, called spirometry, to see if you have developed COPD. WebMD has many resources to help you to successfully quit smoking.

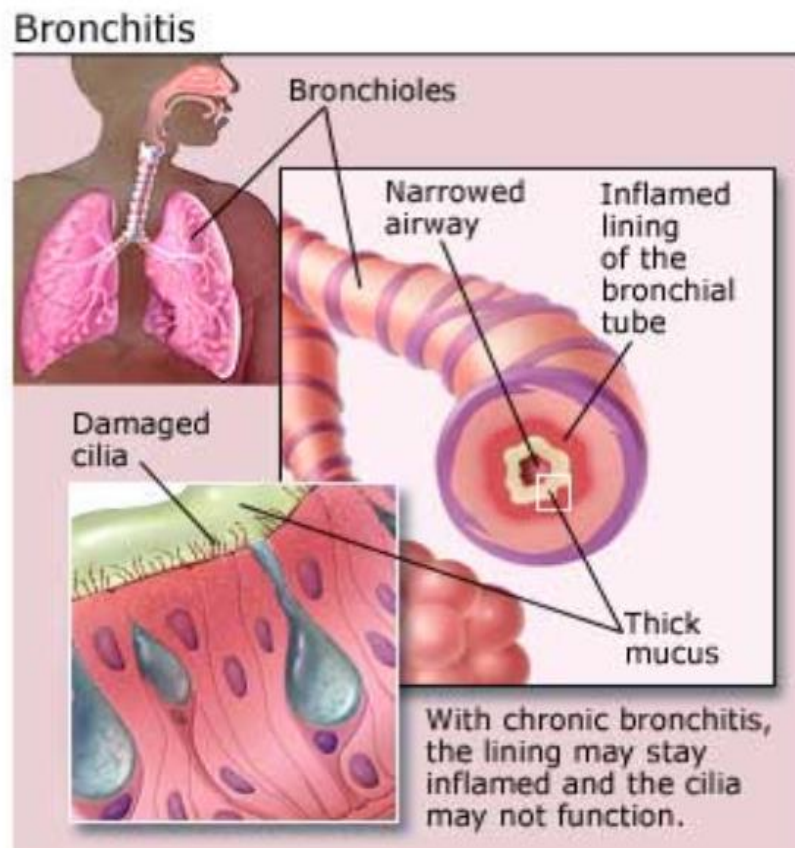
## MEDICAL PATHOLOGY

Acute bronchitis is very common. The disorder often can be treated effectively without professional medical assistance. However, if you have severe or persistent symptoms or high fever, or if you cough up blood, you should see your doctor right away.

Seek emergency medical help if you have trouble breathing or have chest pain.

Acute bronchitis is inflammation of the bronchial tubes. The most common cause of acute bronchitis is a viral or bacterial infection, but other causes may include irritants like tobacco smoke, air pollution, or chemicals. The primary symptom of acute bronchitis is a cough.

Chronic bronchitis is a serious long-term disorder that often requires regular medical treatment. If you suffer from chronic bronchitis, you are at risk for developing heart problems, as well as more serious lung diseases and infections, so you should be monitored by a doctor.



## MEDICAL PATHOLOGY

Chronic bronchitis is one of two main types of a COPD. The other main form of COPD is emphysema. Both forms of COPD make it difficult to breathe.

### **What Causes Bronchitis?**

Acute bronchitis is generally caused by lung infections, 90% of which are viral in origin. Repeated attacks of acute bronchitis which weaken and irritate bronchial airways over time can result in chronic bronchitis.

Industrial pollution is another culprit. Chronic bronchitis is found in higher-than-normal rates among coal miners, grain handlers, metal molders, and other people who are continually exposed to dust and fumes. But the chief cause is heavy, long-term cigarette smoking, which irritates the bronchial tubes and causes them to produce excess mucus. The symptoms of chronic bronchitis are also worsened by high concentrations of sulfur dioxide and other pollutants in the atmosphere.

## **NEUROPSYCHIATRIC DISORDER**

Psychiatry is the branch of psychiatry science that investigates the links between mental illness and organic disease of the brain. Neuropsychiatry is the branch of medicine dealing with diseases affecting the brain and the nervous system.

### **Parkinson's disease**

Parkinson's disease (PD) is a progressive disease of the nervous system marked by tremor, muscular rigidity, and slow, imprecise movement, chiefly affecting middle-aged and elderly people. It is associated with degeneration of the basal ganglia of the brain and a deficiency of the neurotransmitter dopamine.

Parkinson's disease (PD) is a chronic and progressive movement disorder, meaning that symptoms continue and worsen over time. Parkinson's involves the malfunction and death of vital nerve cells in the brain, called neurons. Parkinson's primarily affects neurons in an area of the brain called the substantia nigra.

Parkinson's disease affects the way you move. It happens when there is a problem with certain nerve cells in the brain.

Normally, these nerve cells make an important chemical called dopamine. Dopamine sends signals to the part of your brain that controls movement. It lets your muscles move smoothly and

## MEDICAL PATHOLOGY

do what you want them to do. When you have Parkinson's, these nerve cells break down. Then you no longer have enough dopamine, and you have trouble moving the way you want to.

Parkinson's is progressive, which means it gets worse over time. But usually this happens slowly, over many years. And there are good treatments that can help you live a full life.

No one knows for sure what makes these nerve cells break down. But scientists are doing a lot of research to look for the answer. They are studying many possible causes, including aging and poisons in the environment.

Abnormal genes seem to lead to Parkinson's disease in some people. But so far, there is not enough proof to show that it is always inherited.

The four main symptoms of Parkinson's are:

- Tremor, which means shaking or trembling. Tremor may affect your hands, arms, or legs.
- Stiff muscles.
- Slow movement.
- Problems with balance or walking.

Tremor may be the first symptom you notice. It's one of the most common signs of the disease, although not everyone has it.

More importantly, not everyone with a tremor has Parkinson's disease.

Tremor often starts in just one arm or leg or on only one side of the body. It may be worse when you are awake but not moving the affected arm or leg. It may get better when you move the limb or you are asleep.

In time, Parkinson's affects muscles all through your body, so it can lead to problems like trouble swallowing or constipation.

In the later stages of the disease, a person with Parkinson's may have a fixed or blank expression, trouble speaking, and other problems. Some people also lose mental skills (dementia).

People usually start to have symptoms between the ages of 50 and 60. But sometimes symptoms start earlier.

### **Who gets Parkinson's disease?**

As stated previously, men are about 1.5 times more likely to develop Parkinson's disease than women; however, although the majority of all patients that get the disease are over 60, the total chance of getting the disease is about 2% to 4% in this age group. Consequently, the disease is not rare but the chances of someone age 60 or over developing the disease is not high.

### **Parkinson's disease Causes?**

Cells in the substantia nigra, a part of the brainstem that controls movement, slow down and then stop producing dopamine as the cells die. Dopamine helps nerve cells communicate about movement; without the dopamine, body commands about normal movement are disrupted resulting in Parkinson's disease because the brain does not receive the necessary messages about how and when to move. Unfortunately, the ultimate cause of Parkinson's disease, the reason that the cells in the brainstem become altered and die, is not known but researchers suggest that a combination of both genetic and environmental factors cause about 90% of all Parkinson's disease.

### **Pathophysiology of Parkinson's Disease**

Although we are learning more each day about the pathophysiology of Parkinson's disease, it is still considered largely idiopathic (of unknown cause). It likely involves the interaction of host susceptibility and environmental factors. A small percentage of cases are genetically linked and genetic factors are being intensely studied.

Physiologically, the symptoms associated with Parkinson's disease are the result of the loss of a number of neurotransmitters, most notably dopamine. Symptoms worsen over time as more and more of the cells affected by the disease are lost. The course of the disease is highly variable, with some patients exhibiting very few symptoms as they age and others whose symptoms progress rapidly.

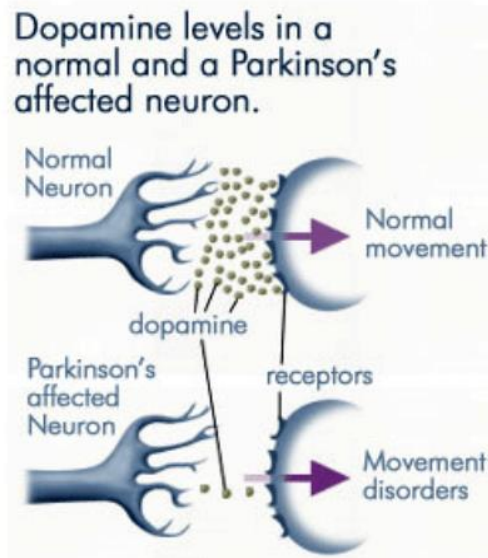
Parkinson's is increasingly seen as a complex neurodegenerative disease with a sequence of progression. There is strong evidence that it first affects the dorsal motor nucleus of the vagus nerve and the olfactory bulbs and nucleus, then the locus coeruleus, and eventually the substantia nigra. Cortical areas of the brain are affected at a later stage. Damage to these various neuronal systems account for the multi-faceted pathophysiologic changes that cause impairments not just to the motor system but also to the cognitive and neuropsychological systems.

### **Progressive Loss of Dopamine**

Although dopamine cell loss cannot be measured directly, measurements in neurologically normal people and in nonhuman primates reveal a slow progressive loss of dopamine with age. In Parkinson's disease the loss occurs at a much greater rate and both biochemical measures and imaging studies suggest there is a significant decrease in dopamine by the time motor symptoms appear. In this view, Parkinson's disease is an accelerated version of the cell death seen with

## MEDICAL PATHOLOGY

normal aging (Cookson, 2009). This is illustrated in the graph below, which shows the decline of dopaminergic neurons during normal aging, in idiopathic PD, in PD caused by environmental or genetic factors, and in early-onset PD.



As less and less dopamine is produced by the neurons affected by Parkinson's disease, far less dopamine is available to bind to the dopamine receptors on the post-synaptic membrane

## ALZHEIMER'S DISEASE

**Definition:** Alzheimer's disease is a progressive, degenerative **disorder** that attacks the brain's nerve cells, or neurons, resulting in loss of memory, thinking and language skills, and behavioral changes.

The disease makes brain tissue break down over time. It usually happens to people over age 65.

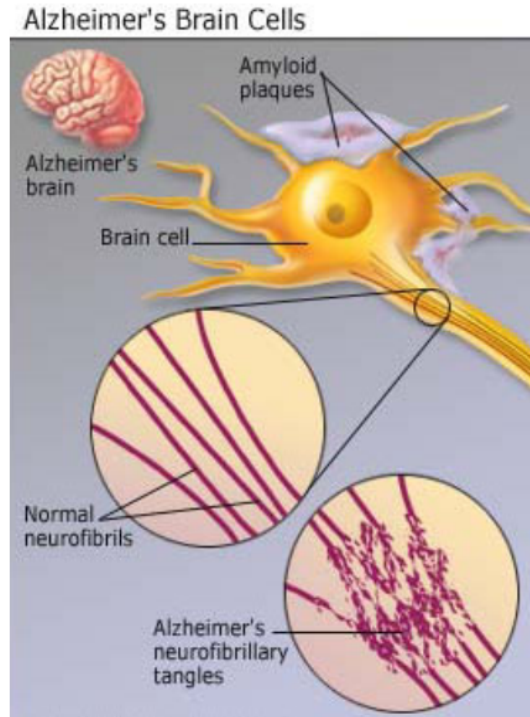
A person can live with Alzheimer's disease for just a few years or for a few decades. More often, however, people live with it for about 9 years. About 1 in 8 people age 65 and over has the disease. Women are more likely to have it than men.

What Causes Alzheimer's disease?

People who get Alzheimer's disease are usually older, but the disease isn't a normal part of aging. Scientists aren't sure why some people get it and others don't. But they do know that the symptoms it causes seem to come from two main types of nerve damage:

- Nerve cells get tangles, called neurofibrillary tangles.
- Protein deposits called beta-amyloid plaques build up in the brain.

## MEDICAL PATHOLOGY



The causes could be a protein in blood called ApoE (for apolipoprotein E), which the body uses to move cholesterol in the blood.

There are a few types of ApoE that may be linked to a higher risk of Alzheimer's. It could be that certain forms of it cause brain damage. Some scientists think it plays a role in building the plaques in the brains of people with Alzheimer's.

Whether or not ApoE partly causes Alzheimer's, genes almost certainly play a role in the disease. Someone with a parent who had the disease is more likely to have it, too.

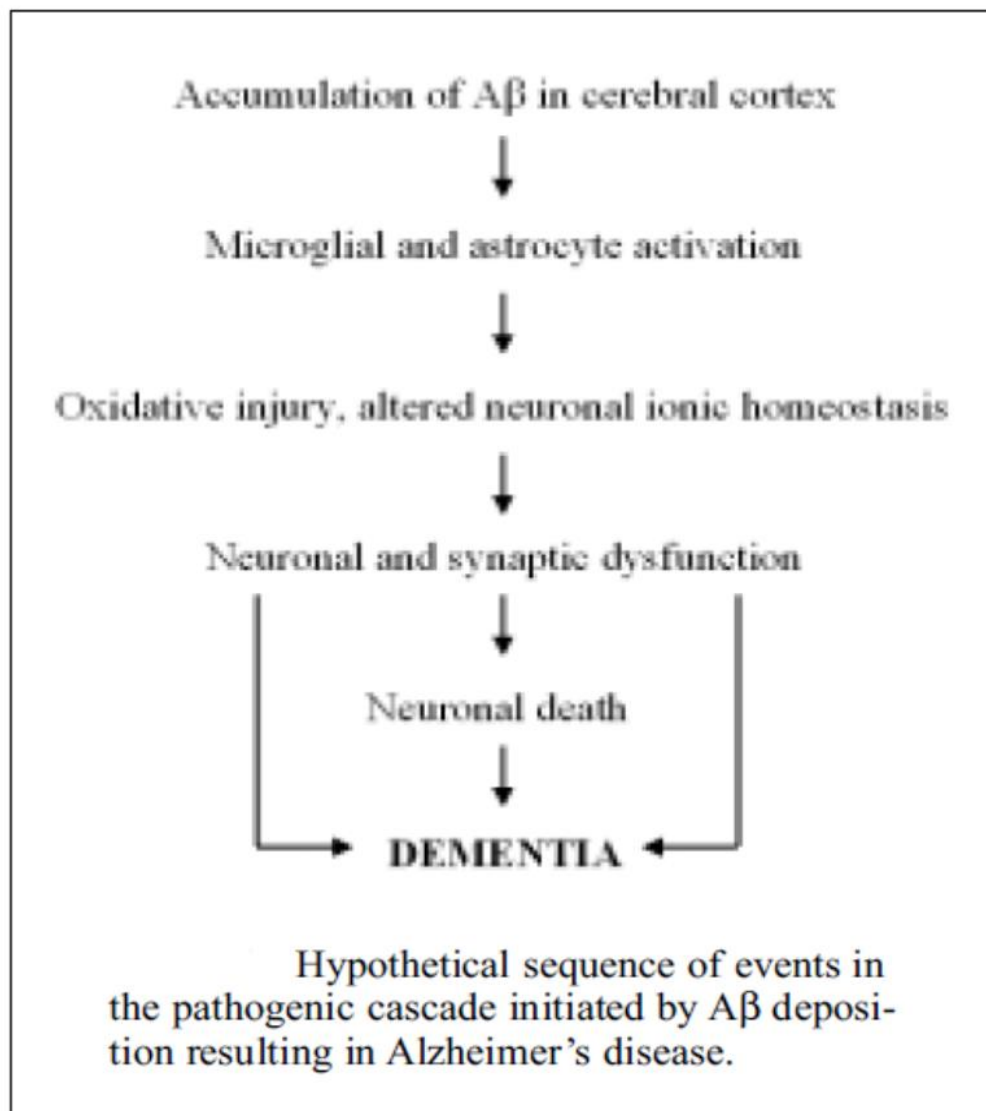
There is some evidence that people with high blood pressure and high cholesterol have a greater chance of getting Alzheimer's. More rarely, head injuries may be a reason, too -- the more severe they are, the greater the risk of Alzheimer's later in life.

### **Pathophysiology of Alzheimer's disease**

Alzheimer's disease (AD) is a progressive dementia with loss of neurons and the presence of two main microscopic neuropathological hallmarks: extracellular amyloid plaques and intracellular neurofibrillary tangles • Early onset AD, the rare familial form, is the result of a mutation in one of three genes: (amyloid precursor protein), (presenilin 1) or (presenilin 2). The sporadic form occurs usually after 65 years of age and accounts for most cases; it most likely results from a combination of genetic and environmental influences • The only confirmed risk factors for

## MEDICAL PATHOLOGY

sporadic AD are age and the presence of the E4 allele of (apolipoprotein E) • Amyloid plaques comprise mainly of the neurotoxic peptide amyloid ( $A\beta$ , Abeta), cleaved sequentially from a larger precursor protein (APP) by two enzymes:  $\beta$ -secretase (also called BACE1) and  $\gamma$ -secretase (comprising four proteins, one of which is presenilin). If APP is first cleaved by the enzyme  $\alpha$ -secretase rather than  $\beta$ -secretase then  $A\beta$  is not formed • Neurofibrillary tangles comprise mainly of the protein tau which binds microtubules, thereby facilitating the neuronal transport system. Uncoupling of tau from microtubules and aggregation into tangles inhibits transport and results in microtubule disassembly. Phosphorylation of tau may play an important role in this • Selective vulnerability of neuronal systems such as the cholinergic, serotonergic, noradrenergic and glutamatergic systems form the basis of current rational pharmacological treatment.



# MEDICAL PATHOLOGY

