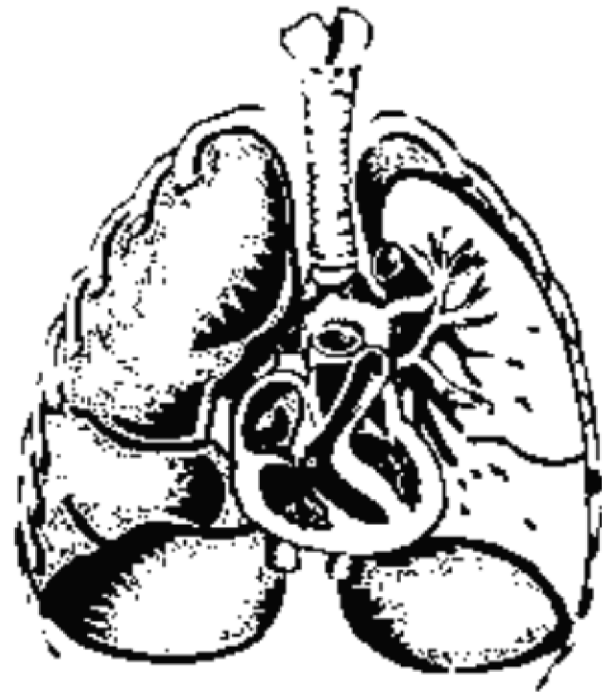




Disorders of the respiratory system



Respiratory infections



Infections of the respiratory tract can occur in:

1. The upper respiratory tract
2. The lower respiratory tract
3. Both.

Organisms capable of infecting respiratory structures include:

1. bacteria.
2. viruses: the majority of upper respiratory tract infections are caused by viruses as *rhinovirus* and *parainfluenza virus*.
3. fungi.

Depending on the organism and extent of infection, the symptoms can range from mild to severe and even life threatening.

- The respiratory tract is protected by a number of very effective **defense mechanisms**.
- For an organism to reach the lower respiratory tract, **the organism must be particularly virulent** and present in very large numbers or the **host defense barriers** must be weakened.
 - Factors that might weaken the respiratory defense barriers:
 - ✗ Cigarette smoking, which can paralyze the cilia lining the cells of the respiratory passages and impair removal of secretions, particles and microorganisms.
 - ✗ The presence of a respiratory pathogen such as the cold or influenza virus .

Upper respiratory tract Infections

THE COMMON COLD

The most common viral pathogens for the "common cold" are *rhinovirus*, *parainfluenza virus*, *respiratory syncytial virus*, *adenovirus* and *coronavirus*.

- They enter body through the mucous membranes of the nose and eye. They are readily spread from person to person via respiratory secretions.
- Manifestations of the common cold include:
 - Rhinitis*: Inflammation of the nasal mucosa
 - Sinusitis* :Inflammation of the sinus mucosa
 - Pharyngitis* : Inflammation of the pharynx and throat
 - Headache
 - Nasal discharge and congestion



Upper respiratory tract Infections

INFLUENZA

- **Symptoms of influenza infection:**
 - × Headache
 - × Fever, chills
 - × Muscle aches
 - × Nasal discharge
 - × Unproductive cough
 - × Sore throat
- Influenza infection **can cause** marked inflammation of the respiratory epithelium and a loss of ciliated cells that protect the respiratory passages from other organisms.
- As a result, influenza infection **may lead to** co-infection of the respiratory passages with bacteria.
- It is also possible for the influenza virus to infect the tissues of the lung itself to cause a **viral pneumonia**.



Treatment of influenza:

- × Bed rest, fluids, warmth
- × Antiviral drugs
- × Influenza vaccine :
 - ◆ Provides protection against certain A and B influenza strains that are expected to be prevalent in a certain year.
 - ◆ The vaccine must be updated and administered yearly to be effective but will not be effective against influenza strains not included in the vaccine.
 - ◆ The influenza vaccine is advised for elderly people, in individuals weakened by other disease and in health-care workers

	COLD	INFLUENZA
Fever	Rare	39-40°
Headache	Rare	Usual
Body aches	Mild	Severe
Weakness	Mild	May last 3 wks
Extreme fatigue	Unusual	Usual
Nasal congestion	Common	Common
Sneezing	Common	Sometimes
Sore throat	Common	Common
Chest discomfort/ cough	Mild	Mod-Severe

Asthma – What is It?



- Asthma is a chronic lung disease that obstructs airflow
- The obstruction is reversible
- It involves difficulty in breathing due to
 - Inflammation (swelling)
 - Mucus in the airways
 - Tightening of muscles around the airways





Asthmatic bronchiole



Normal bronchiole

Trigger: Type of Substance**Examples**

Air pollutants, including dusts, smoke, mists & fumes

Diesel exhaust; tobacco smoke; mineral, rock, coal, & wood dusts; gases; fumes & vapors from aerosol agents, chemicals, cleaning materials, solvents, paints, welding & from heating & cooling metals quickly

Pollens, mites & molds

Trees, flowers, weeds, hay, plants

Animal dander

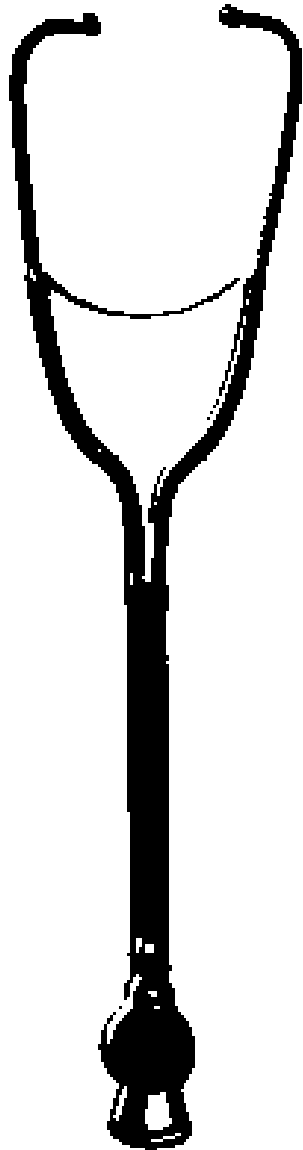
Birds, cats, dogs

Medications

Aspirin, anti-inflammatory drugs

Foods

Egg, wheat, nuts



Symptoms of asthma

- **Coughing**
- **Wheezing, a whistling sound**
- **Shortness of breath**
- **Chest tightness**
- **Sneezing & runny nose**
- **Itchy and inflamed eyes**

Can asthma be cured?

Asthma can be controlled (but not cured) by:

- Avoiding triggers or reducing exposure to triggers
- Using medication to control symptoms

• **Medications** - generally two types are used

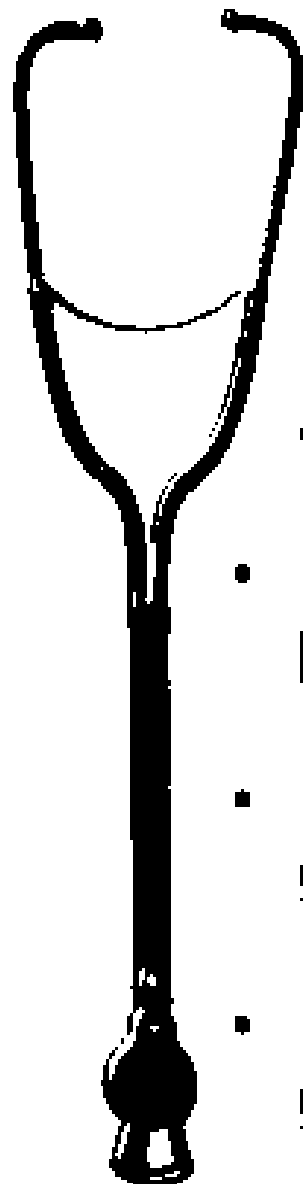
- Long-term drugs

- Taken to prevent excess production of mucus & to reduce the inflammation and constriction of airway muscles

- Rescue or quick-relief drugs

- Taken to relax muscles around the airways to improve breathing





What YOU can do if you have asthma?

Identify and minimize contact with your asthma trigger(s)

- Understand and take asthma medications as prescribed
- Recognize early signs that your asthma is getting worse
- Know what to do when your asthma is getting worse

LARYNGITIS

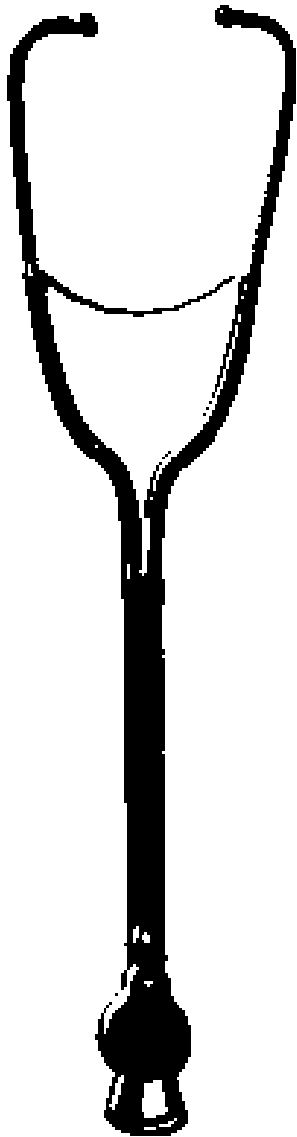
An inflammation of the larynx.
It causes hoarse voice or the complete loss of the voice because of irritation to the vocal folds.



BRONCHITIS

Bronchitis is an inflammation of the main air passages to the lungs.

- *Most prevalent in winter*
- *Generally part of an acute URI*
- *It may develop after a common cold or other viral infection of the nasopharynx, throat, or bronchi*
- *Often with secondary bacterial infection*



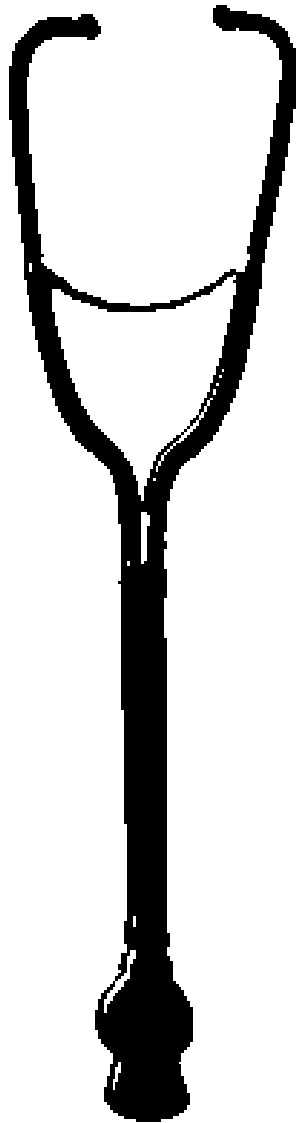


Normal bronchi



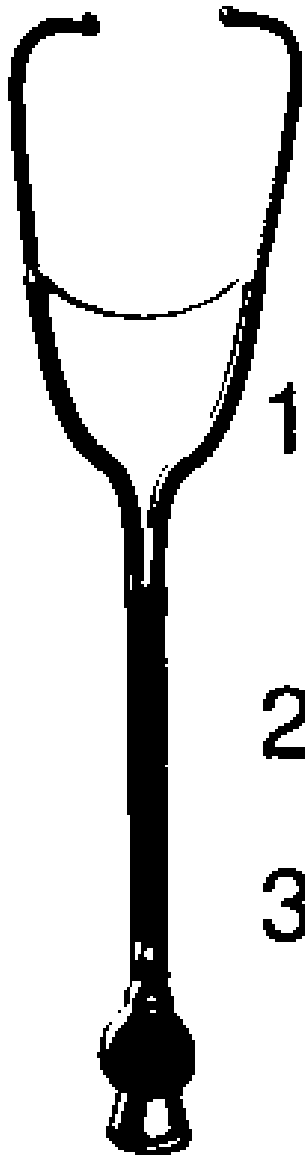
Bronchitis





Signs & symptoms

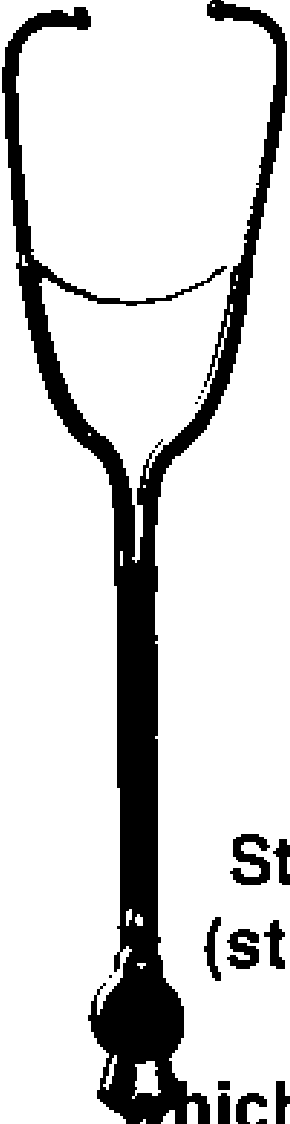
- 1. Malaise**
- 2. Chilliness**
- 3. Slight fever**
- 4. Back and muscle pain**
- 5. Sore throat**
- 6. Onset of a distressing cough usually signals onset of bronchitis**
- 7. Cough starts off dry and later produces mucous.**



Treatment

1. The patient should rest until fever subsides
2. Drink plenty of fluids.
3. Fever reducer.

STREP THROAT



Strep throat is a bacterial infection of the tissues in the back of the throat and the tonsils. The tissues become irritated and inflamed, causing a sudden, severe sore throat.

Strep throat is caused by streptococcal (strep) bacteria. There are many different strains of strep bacteria, some of which cause more serious illness than others.





The most common symptoms of strep throat are:

- a sudden, severe sore throat
- pain or difficulty swallowing
- fever over 101 F
- swollen tonsils and lymph nodes
- white or yellow spots on the back of a bright red throat
- headache and abdominal pain
- Strep can cause a red skin rash, vomiting, loss of appetite, and a general feeling of discomfort or illness.



Strep throat is diagnosed with a physical examination, medical history, and a rapid strep test. A throat culture is sometimes done to confirm the results of the rapid strep test.

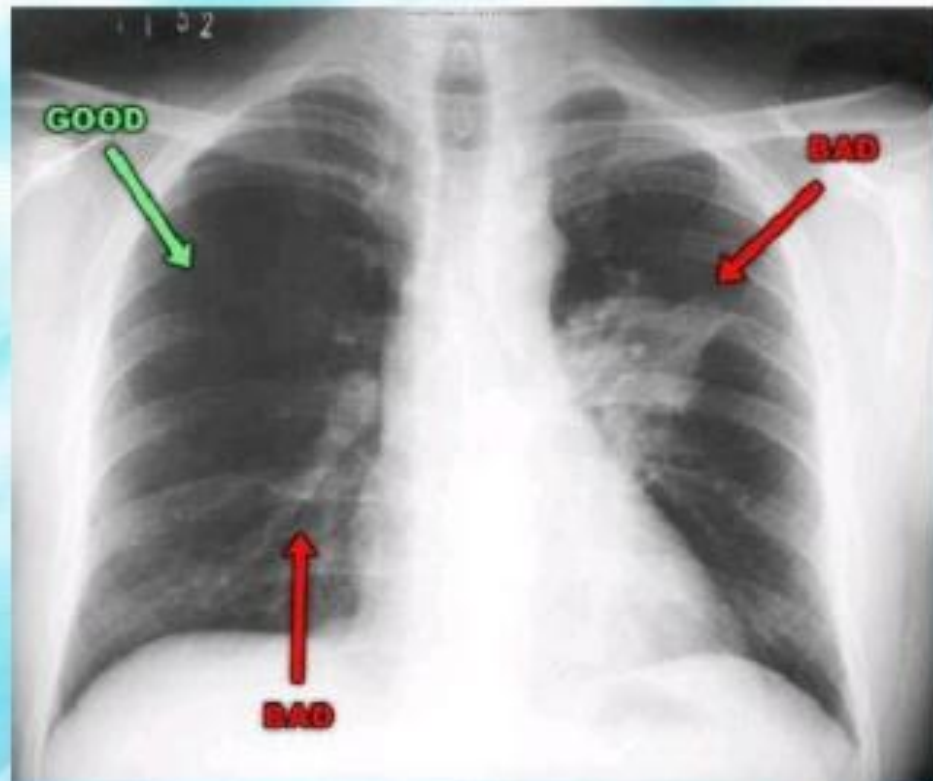




- Strep throat will go away in 3 to 7 days. However, strep throat is still treated with antibiotics even if they do not speed recovery.
- Antibiotics kill the strep bacteria, shorten the time you are contagious, and reduce the risk of complications, such as the infection spreading to other parts of your body.
- Your health professional also may also recommend nonprescription medications to relieve pain and discomfort
- and reduce fever caused by strep throat.

Pneumonia

- Most deadly infectious disease in the U.S.
- 6th leading cause of death



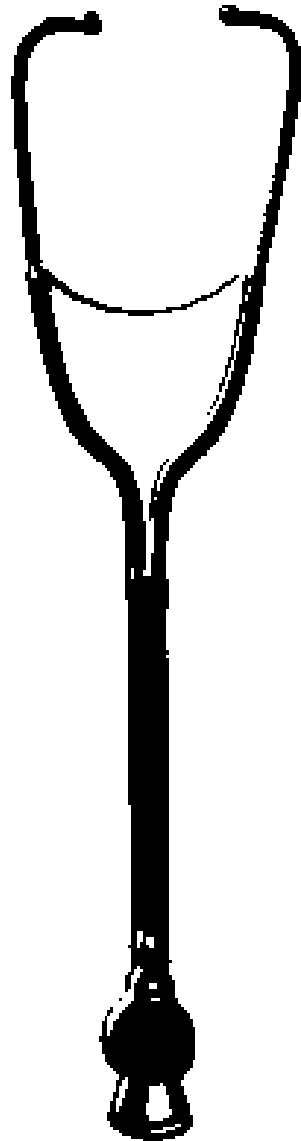


Lower respiratory tract Infections

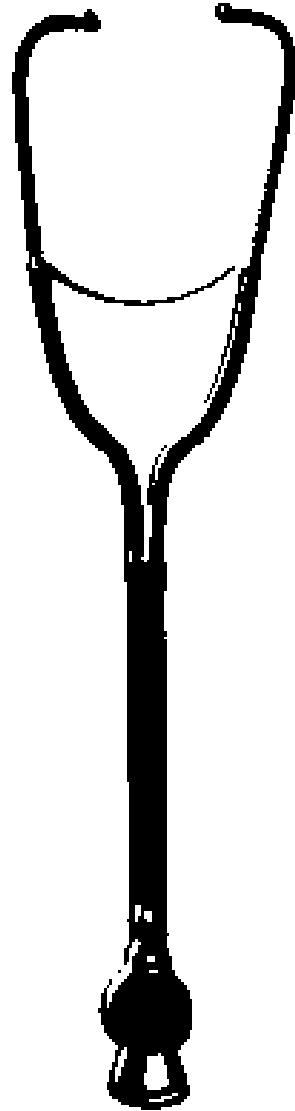
PNEUMONIA

Individuals Most at Risk for Pneumonia

- × Elderly
- × Those with viral infection
- × Chronically ill
- × AIDS or immunosuppressed patients
- × Smokers
- × Patients with chronic respiratory disease e.g. bronchial asthma.



- Pneumonia occurs when bacteria (most commonly *Streptococcus pneumoniae*), chemical irritants, or viruses get into your lungs.
- Pneumonia causes the alveoli in the lungs to fill with pus or other liquid. This causes difficulty in breathing.

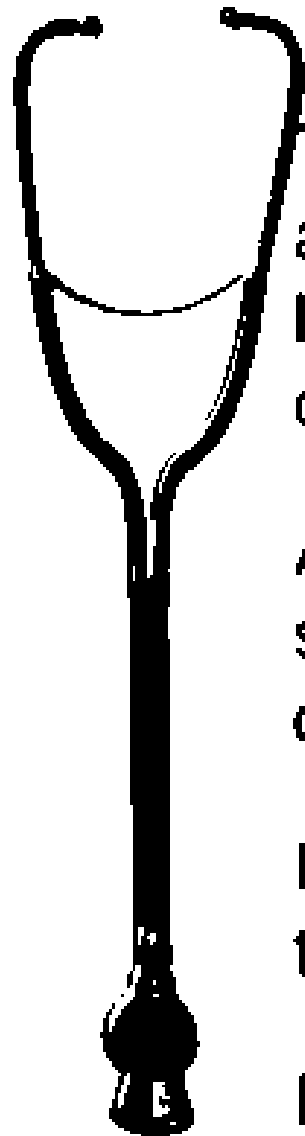


Pneumonia

Inflammation or infection of the alveoli
in the lungs.

SYMPTOMS

- ~fever
- ~bluish skin
- ~difficulty breathing
- ~increased pulse
- ~mucus cough
- ~mental confusion



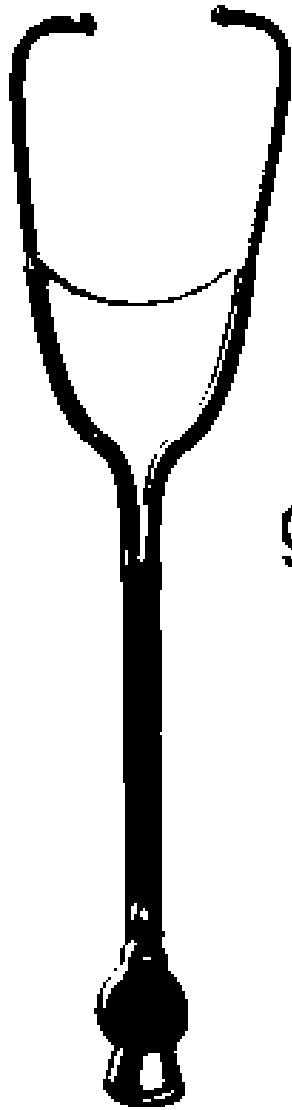
Treatment of Pneumonia

To treat Pneumonia a doctor would choose an antibiotic. Mainly based on your health, how serious the pneumonia is, and by how old you are.

Amoxicillin is an antibiotic medicine that is sometimes prescribed by doctors, depending on how bad the pneumonia is.

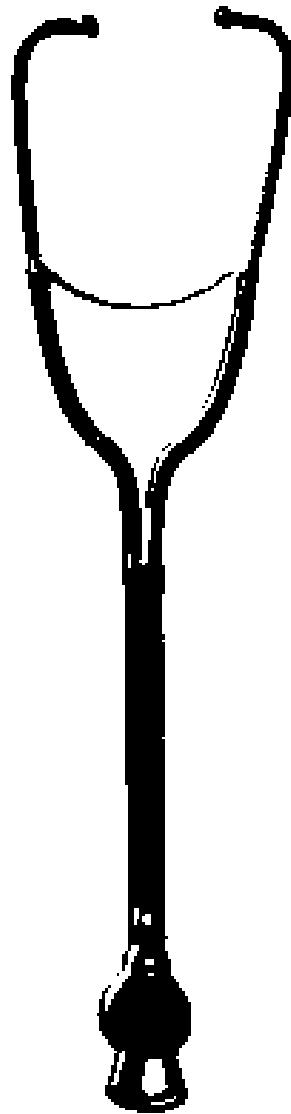
If pneumonia isn't bad, the infection can be treated at home with oral antibiotics.

Drink a lot of fluids as well.



EMPHYSEMA

Emphysema is a chronic (long-lasting) disease that gradually destroys the lungs. This destruction means that you become unable to breathe in enough oxygen. You also have trouble breathing out carbon dioxide.

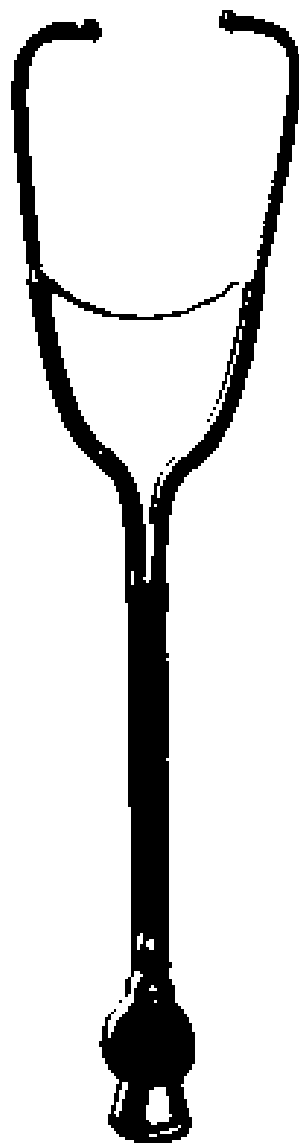


Cigarette smoking is by far the most common reason that people develop emphysema, and it is also the most preventable cause. Other risk factors include air pollution, heredity, male sex, and age.

Cigarette smoke contributes to this disease process in 2 ways.

1. It destroys lung tissue, which is the cause of the obstruction.
2. It causes inflammation and irritation of airways that can cause the disease to get worse.





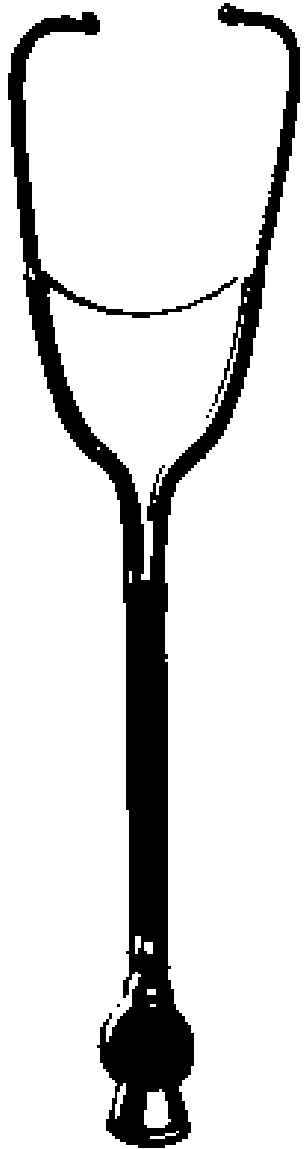
What is tuberculosis (TB)?

Tuberculosis (TB) is a disease caused by bacteria called *Mycobacterium tuberculosis*.

The TB bacteria can affect any part of the body, but usually affects the lungs.

If not treated properly, a person who has **TB infection can develop TB disease.**

If a person develops **TB disease and does not get** appropriate medical treatment he/she can die.

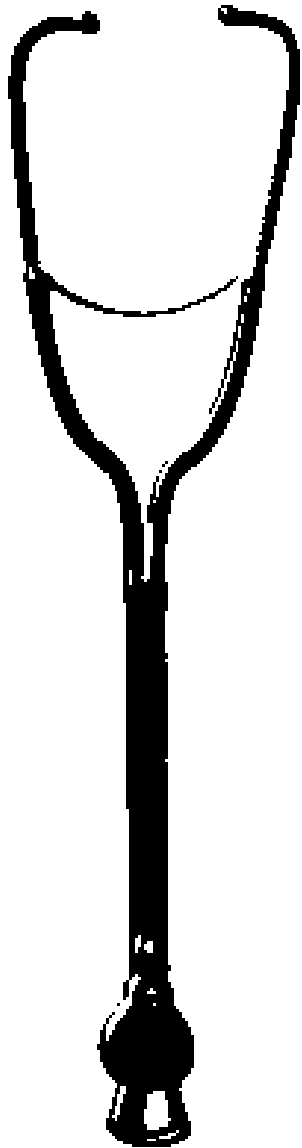


How do you get TB?

TB is generally spread through the air when a person who has **TB disease frequently** sneezes, coughs, speaks or sings near others for a long period of time.

Persons who breathe in air containing TB germs can become **infected with TB.**

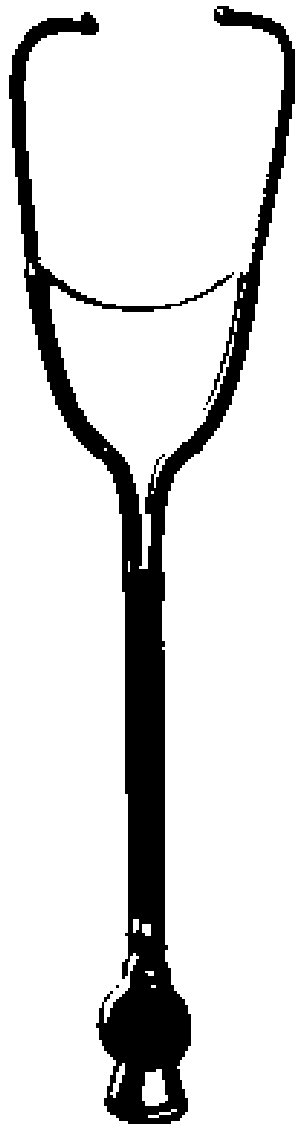
Typically, only close contacts of a person who has **TB disease are considered to be at risk.**



How is TB infection different
from TB disease?

People with **TB infection** have a **positive** TB skin test but they: are not sick, do not have symptoms, cannot spread TB to others, can develop **TB disease** if **not treated for TB infection**.

When **TB infection** is treated it **greatly** reduces the chance that you will ever develop **TB disease**.



How do I get tested for TB?

A TB skin test is performed by injecting a small amount of fluid in the skin on the lower part of the arm. You will need to return within 48-72 hours to have a trained health care worker see if the skin test is positive or negative.

You can get a skin test at your local health department or at your healthcare provider's office.

If you have a positive reaction to the skin test (**TB infection**), **your healthcare provider may do other tests to see if you have developed TB disease.**



What are the symptoms of TB?

Symptoms of TB disease include: feelings of sickness or weakness, weight loss, fever, and night sweats.

When TB disease affects the lungs, additional symptoms may include: a bad cough that lasts longer than 2 weeks, shortness of breath, pain in the chest and coughing up blood.



Remember...

TB infection occurs when a person has breathed in the TB germ, but the person is not sick.

TB disease can develop in a person with TB infection if they do not get medical treatment.

A person with TB disease is sick and may have several symptoms of the disease.

If left untreated, persons with TB disease can die from TB.



How is TB treated?

TB disease can usually be cured by taking several medicines for 6-12 months.

It is very important that people who have TB disease take the medication exactly as prescribed.

If you stop taking the medication too soon, you can become sick again.

Also, if you do not take the medication correctly, the germs may become resistant to those medications and become more difficult to treat.





LUNG CANCER

Lung cancer is the #1 cause of cancer-related deaths by far in the U.S.

...more than breast, prostate, and colon cancer combined.



Risk Factors:

- Smoking (90% of all cases)
- Second-hand smoke (25% of non-smoker cases)
- Occupational/environmental

What Are the Symptoms of Lung Cancer?



- **Fatigue (tiredness)**
- **Cough**
- **Shortness of breath**
- **Chest pain**
- **Loss of appetite**
- **Coughing up phlegm**
- **Hemoptysis (coughing up blood)**
- **If cancer has spread, symptoms include bone pain, difficulty breathing, abdominal pain, headache, weakness, and confusion**



How is Lung Cancer Evaluated?

- **Because almost all patients will have a tumor in the lung, a chest x-ray or CT scan of the chest is performed**
- **The diagnosis must be confirmed with a biopsy**
- **The location(s) of all sites of cancer is determined by additional CT scans, PET (positron emission tomography) scans, and MRI (magnetic resonance imaging)**
- **It is important to find out if cancer started in the lung or somewhere else in the body. Cancer arising in other parts of the body can spread to the lung as well**

How is Lung Cancer Treated?



- Treatment depends on the stage and type of lung cancer
- Surgery
- Radiation therapy
- Chemotherapy (options include a combination of drugs)
- Targeted therapy
- Lung cancer is usually treated with a combination of therapies



Smoking
causes fatal lung cancer

Suggestive Reading

Vinay Kumer, Apul L. Abbass, Jon C. Aster. Rubbin Basic pathology, Elsevier, 9th edition, 2013

THANK YOU