

# **TUBERCULOSIS**



# More Terms....



☞ M. tuberculosis - The bacteria which causes tuberculosis (TB).

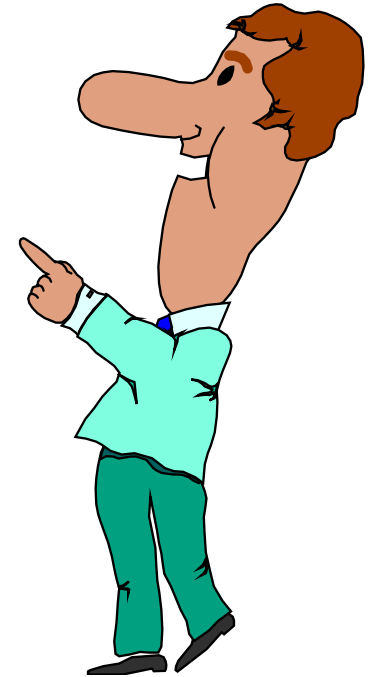
☞ PPD Skin Test- A test for identifying exposure to, *Mycobacterium tuberculosis*.

# TB Transmission

## What is TB?

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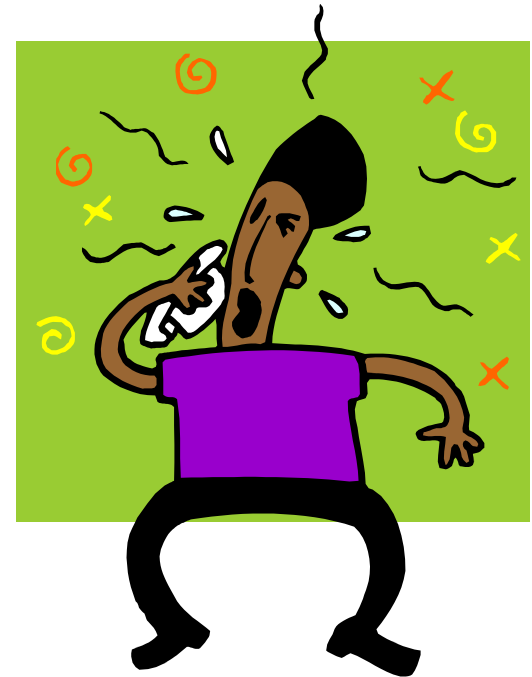
🌀 TB is a disease caused by infection with a bacteria called *Mycobacterium tuberculosis*.



# TB Transmission

## How can you catch TB?

🌀 TB is spread through tiny drops sprayed into the air when an infected person coughs, sneezes, or speaks, or another person breathes the air into their lungs containing the TB bacteria.

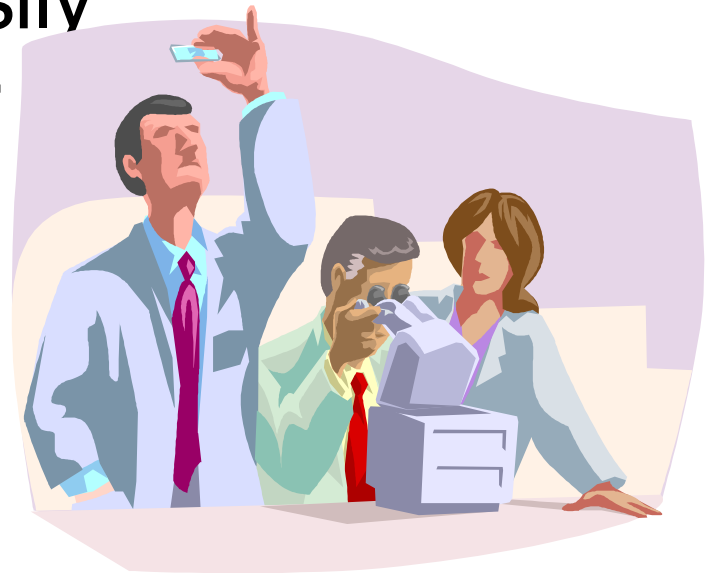


# TB Transmission

## How can you catch TB?

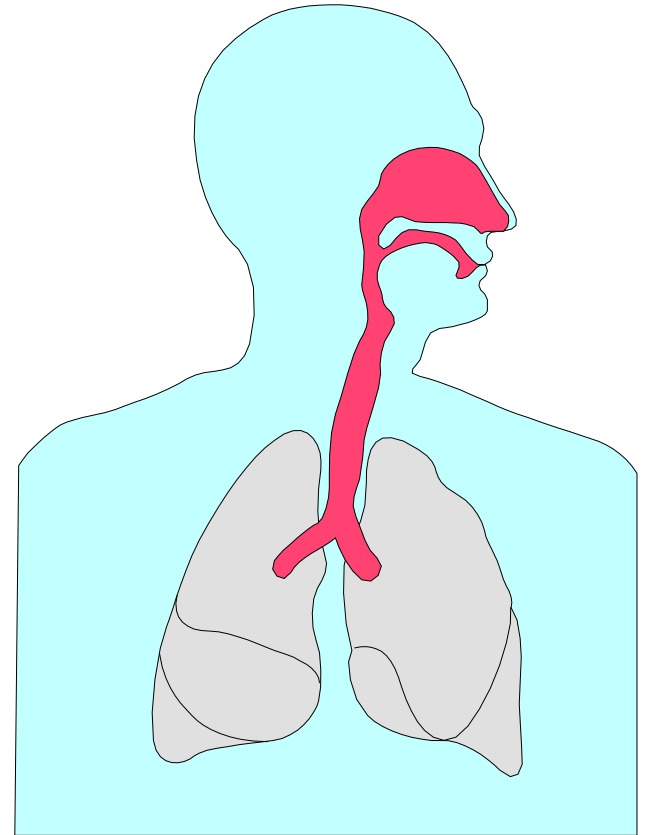
☞ TB is not visible, and can only be seen under a microscope.

☞ TB droplets are more easily spread in areas with poor circulation.



# TB Infection and Disease

- ☞ The lungs are the most common place for TB. This is known as pulmonary TB.
- ☞ TB of the voice box is the second most common and is usually called laryngeal TB.



# TB Infection and Disease

**Can the TB bacteria affect other areas of my body other than the lungs?**



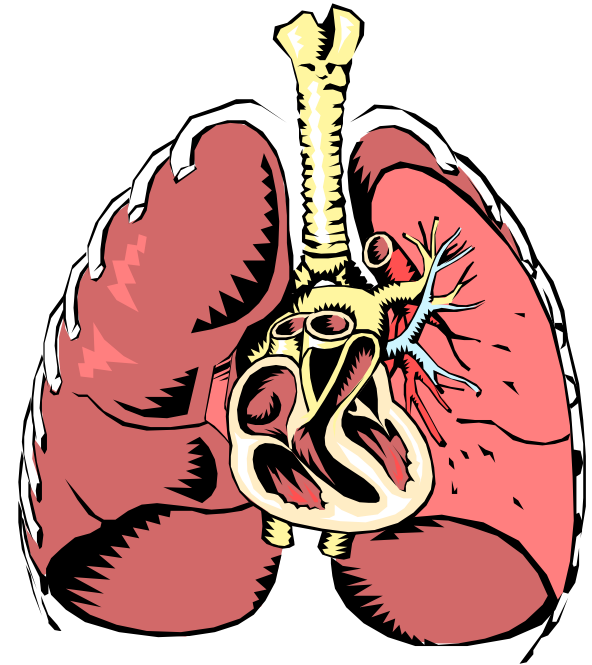
☞ TB can infect the brain, kidneys, bones, and other areas.

☞ TB can also spread through the blood to other organs; this is called miliary TB.

# TB Infection & Disease

There are 2 Categories of TB: *Latent & Active*

- ☞ TB infection of the lungs can fall into 2 categories of disease: Latent TB or Active TB.
- ☞ Latent TB means a person is infected by TB bacteria, but cannot infect others, and is not coughing or appearing sick.
- ☞ Latent TB means the body's immune system has contained the infection.



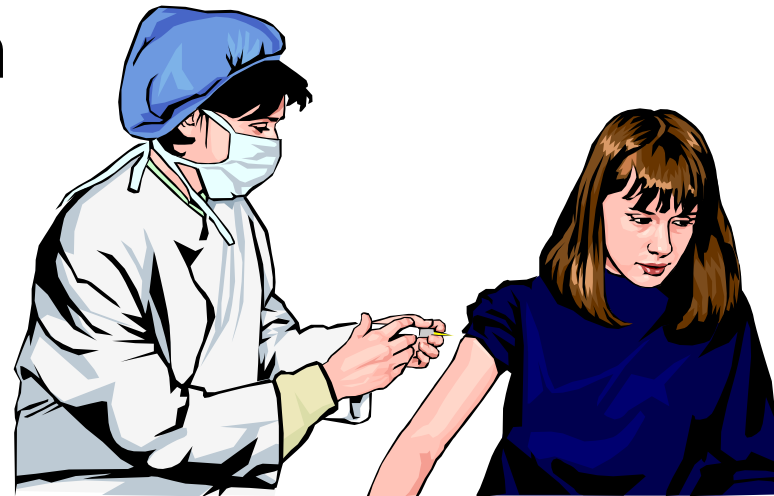


# TB - Infection & Disease

## Categories of TB - Latent

☞ Persons with latent TB are identified by a positive skin test (PPD).

☞ Persons who are not infected with *Mycobacterium tuberculosis* have a negative skin test (PPD).



# TB - Infection & Disease

## Categories of TB - Latent



⌘ When a person with a previously negative PPD, converts to a positive PPD, the conversion indicates recent infection with *M. tuberculosis*.

# TB - Infection & Disease

## Categories of TB - Active



☞ Active pulmonary and laryngeal TB means a person infected with the TB bacteria is sick and can infect others unless they are taking medicine prescribed by their physician to treat TB.

# TB - Infection & Disease

## Categories of TB - Active

☞ Persons with active TB disease usually have some of the following symptoms: cough ( 3 weeks or more), feel weak, have a fever, lose weight, experience night sweats, cough up blood, or have chest pain when coughing.



# TB - Infection & Disease

## Categories of TB - Active

☞ Persons with active TB need to take their medications as prescribed in order to treat the disease and prevent the spread to others.

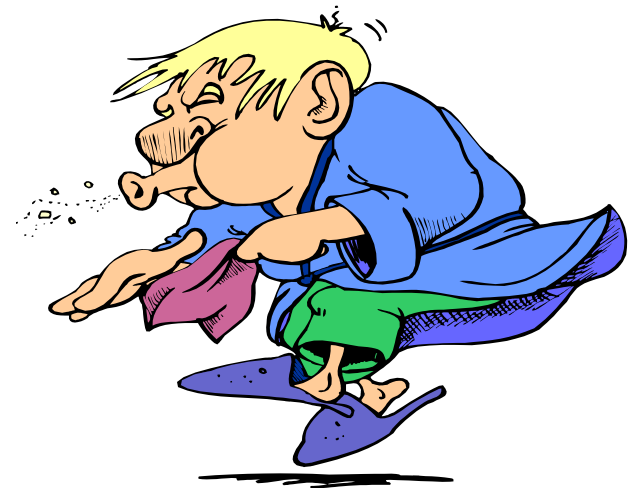


# TB - Infection & Disease

## Categories of TB - Latent & Active

☞ TB disease varies with age and the ability of your body to fight off bacteria.

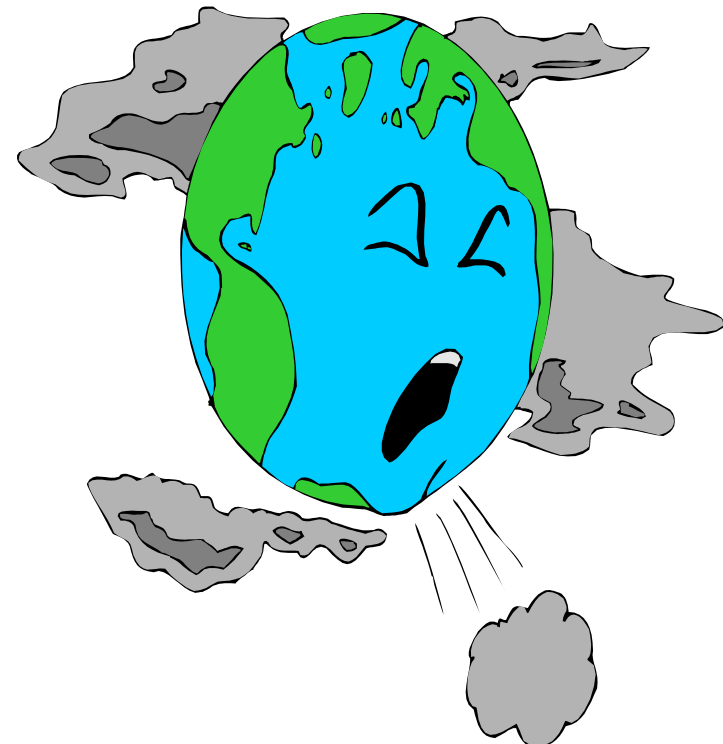
☞ HIV is the strongest risk factor for the progression of Latent TB to Active TB infection.



# TB - Infection & Disease

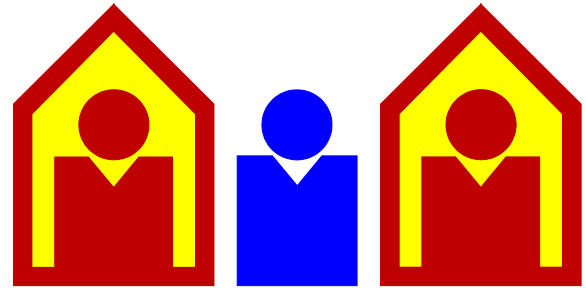
## Categories of TB - Latent & Active

☞ Only a very small percentage of people infected with the TB bacteria will develop active disease within 2 years.

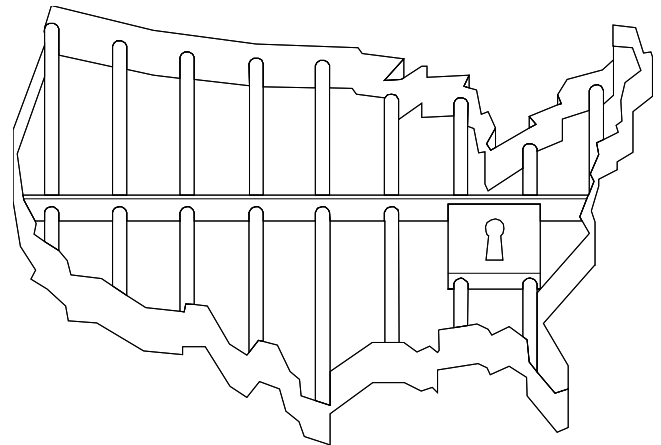


# Tuberculosis Infection & Disease

☞ Homeless persons are at increased risk for catching TB.



☞ TB cases are rising in the prison population due to the increased number of HIV infected inmates, crowded environment, and IV drug abusers.







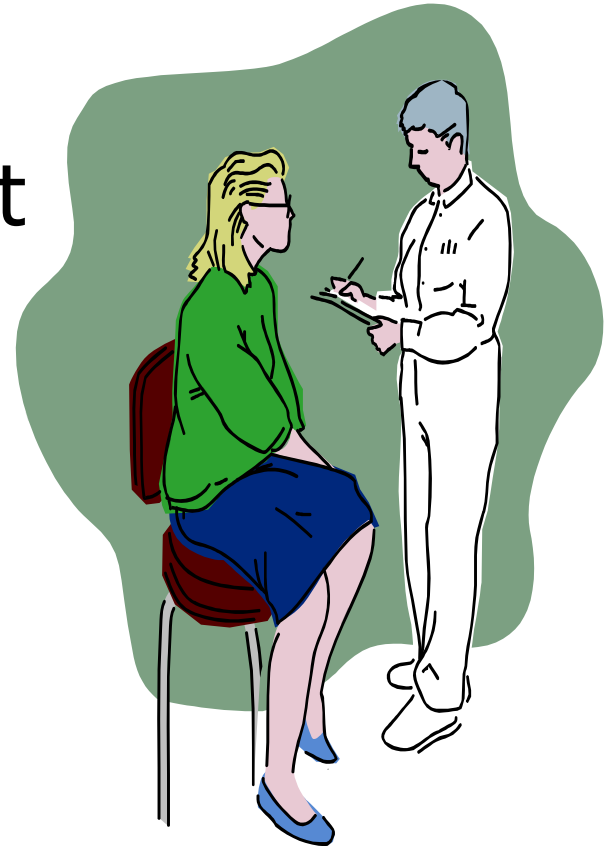
# **The Connection Between HIV and TB**

“TB and HIV like to hang out together  
and they are a bad influence on each  
other....”

-Dr. James Curran, CDC

# Diagnosis and Treatment for Latent & Active TB

Rapid identification and effective treatment for persons with Active TB are necessary in order to prevent further spread of TB.



# Diagnosis and Treatment for Latent & Active TB

## Tools for Diagnosing TB Infection

- ☞ Mantoux skin test (PPD)
- ☞ Chest x-ray
- ☞ Sputum cultures



# Diagnosis and Treatment for Latent & Active TB

## Tools for Diagnosing TB Infection

### Mantoux Skin Test(PPD)

- ☞ Mantoux tuberculin skin test (PPD) is a skin test for identifying exposure to the TB bacteria, *Mycobacterium tuberculosis* (latent infection)
- ☞ The Mantoux test is recommended because it provides the most consistent and reliable result.
- ☞ The Mantoux test is read 48-72 hours after administration. Induration or “knot-like” swelling at the test site is significant and the reaction is measured in millimeter units. Redness at the test site is not measured.



# **Diagnosis and Treatment for Latent & Active TB**

## **Tools for Diagnosing TB Infection**

### **Mantoux Skin Test (PPD)**

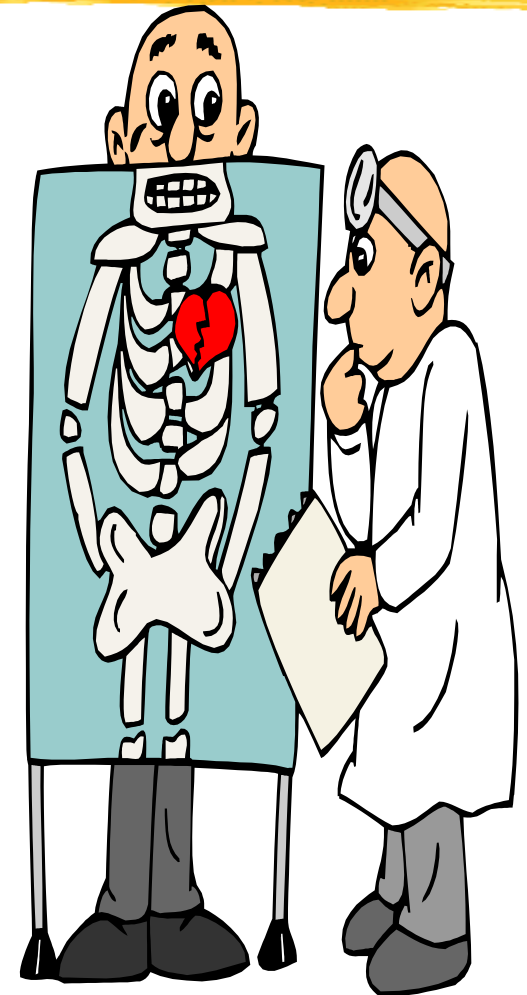
- ☞ Persons with HIV or diseases affecting the immune system may have no response to the skin test.

# Diagnosis and Treatment for Latent & Active TB

## Tools for Diagnosing TB Infection

### Chest X-Ray

- ☞ A chest x-ray is ordered when a person presents a recent skin test conversion and is suspected of having TB.
- ☞ If a chest x-ray is normal, further diagnostic testing may not be necessary.



# Diagnosis and Treatment for Latent & Active TB

## Tools for Diagnosing TB Infection Chest X-Ray

☞ If the chest x-ray shows signs of disease, further diagnostic testing will be needed to confirm TB disease.



# Diagnosis and Treatment for Latent & Active TB

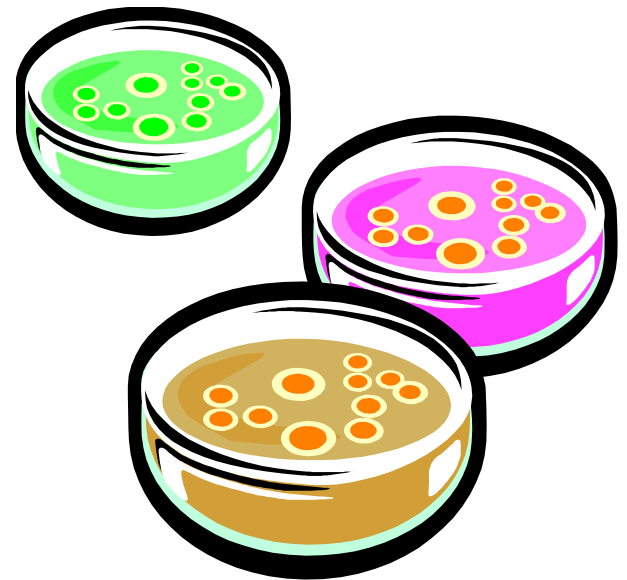
## Tools for Diagnosing TB Infection

### Sputum

☞ A sputum specimen is necessary to confirm that the TB bacteria is present in the lung.

☞ The sputum specimens should:

- come from deep within the lungs;
- be obtained from the first coughed up sputum of the day, for 3 consecutive days
- may be obtained through special respiratory therapy procedures.





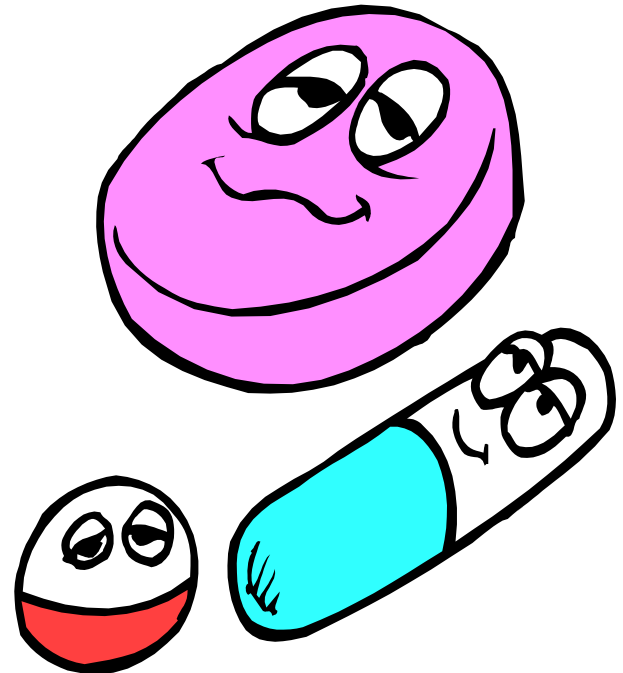
# Treatment for Latent TB

**Why do you need treatment for Latent TB if you do not have the disease?**

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☞ Medication is given to prevent the Latent TB from becoming Active TB disease.

☞ Preventive treatment reduces the risk of getting active TB by more than 90%.



# Treatment for Latent TB

**Why do you need treatment for Latent TB if you do not have the disease?**

☞ Medication, usually Isoniazid (INH) should be taken as prescribed by the physician. The duration of treatment is usually 6-12 months.

☞ INH is an antibiotic that kills the TB bacteria. INH may cause side effects, such as nausea, vomiting, and liver function abnormalities. Therefore, patients will be seen frequently by their doctor until treatment is over.



# Treatment for Latent TB

**Why do you need treatment for Latent TB if you do not have the disease?**



🌀 Persons who do not take the medication as prescribed may develop active TB, and treatment may be prolonged.

# Treatment for Active TB

- ☞ TB is curable, IF it is diagnosed early and appropriate treatment is started promptly.
- ☞ Active TB can be spread to other people if the person is not taking medication to kill the bacteria!



# Treatment for Active TB



☞ When a person with active TB is diagnosed, they should be isolated from other people until the medication begins to kill the bacteria—usually 2 weeks, but sometimes longer.

# Treatment for Active TB

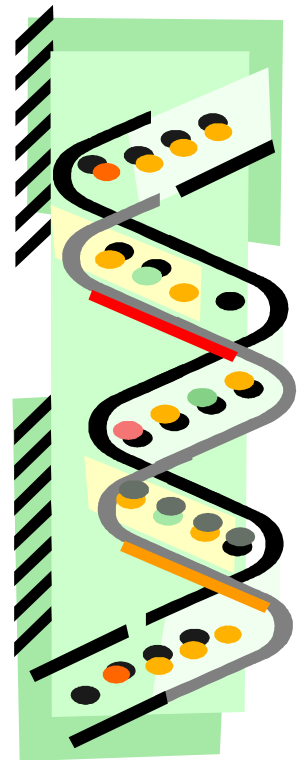
☞ The CDC recommends that infections due to *Mycobacterium tuberculosis* be treated with several drugs in addition to INH: Rifampin, Ethambutol, Streptomycin, and Pyrazinamide.



# Treatment for Active TB

## Multidrug-resistant TB (MDR)

- 🌀 Multidrug-resistant TB is on the rise.  
MDR TB means that some TB bacteria have developed resistance, so that traditional antibiotics, like INH, no longer kill the bacteria. This is due to people not taking their medication properly; new strains of the bacteria evolve.



# **Tuberculosis Disease-Risk Assessment**

## **How many cases of active TB do we treat at GBMC?**



- 🌀 GBMC's risk assessment is based on the CDC Guidelines for Prevention of TB.
- 🌀 The CDC requires GBMC, on an annual basis, to evaluate the potential risk for TB exposure based on the number of active TB cases, employee skin test conversions, and a profile of TB in the community.

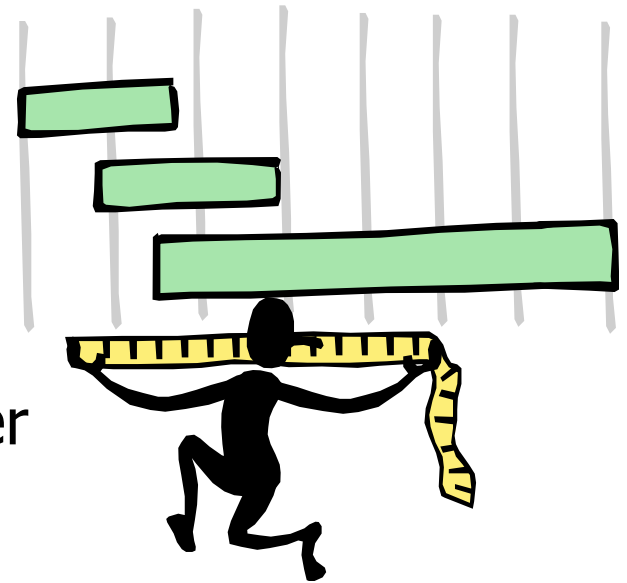


# **Tuberculosis Disease - GBMC**

## **Risk Assessment**

**How many cases of active TB do we treat at GBMC?**

- ☞ Monitoring skin test conversions for health care workers is also required and reported to OSHA.
- ☞ GBMC is in a LOW RISK assessment category, because, historically, the hospital admits less than six cases of Active TB annually.
- ☞ The community served by GBMC accounted for 1% of the total number of active TB cases reported in Maryland in 2001.



# HIV Counseling

- ☞ All persons with suspected and confirmed TB disease should be offered HIV counseling and blood testing, in addition to treatment.
- ☞ This is because TB is more likely to occur among HIV positive individuals.



# HIV Counseling



- ☞ Treatment recommendations may differ for HIV infected persons.
- ☞ It is best to offer HIV counseling and testing in the health care facility.
- ☞ Follow up testing and counseling is essential.

# Fundamentals of TB Infection Control Practices

☞ Identify persons with active TB early.

☞ Initiate effective and appropriate isolation of known or suspected TB cases.

☞ Initiate effective anti-TB treatment promptly.



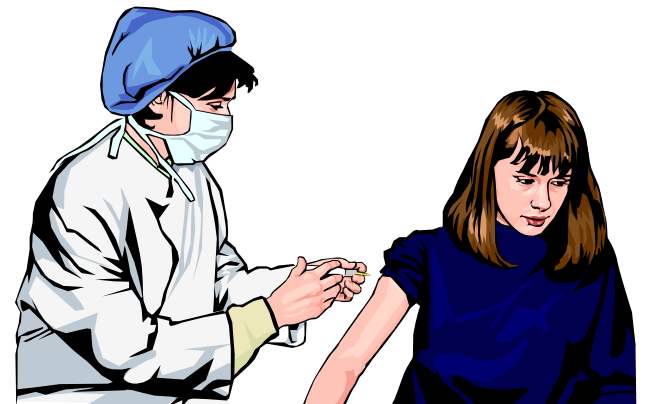
# **Fundamentals of TB Infection Control Practices**



- ☞ Employees should use N95 respirators for any contact with patients suspected of having TB.
- ☞ Screen persons at high risk for TB and provide preventative therapy if infected.

# Fundamentals of TB Infection Control Practices

- ☞ Identify and evaluate persons and health care workers exposed to infectious TB.
- ☞ Screen health care workers for skin test conversions.
- ☞ Conduct surveillance for TB cases among patients and healthcare workers.



# **Initiate**

## **Airborne Precautions When:**



- ☞ A patient is suspected of having TB.
- ☞ A patient has a rule-out diagnosis of TB.
- ☞ A patient has a positive AFB smear.
- ☞ A patient has a significant skin test reaction.
- ☞ A patient is at high risk for TB, and has pneumonia, a cough or bloody sputum.

# Isolation Rooms



- ☞ Isolation rooms are necessary to prevent the spread of TB.
- ☞ Isolation rooms should have at least 6 total air exchanges per hour.
- ☞ Isolation rooms must have air that flows from the hallway into the isolation room (negative pressure).



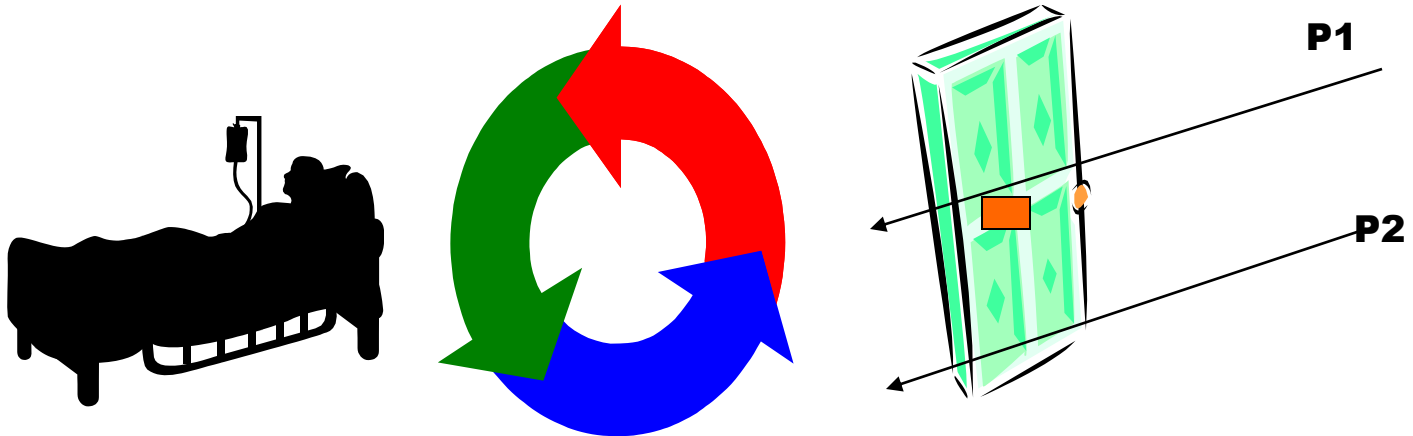
# Isolation Rooms



- ☞ Doors to isolation rooms must remain closed at all times to maintain the negative pressure.
- ☞ The number of healthcare workers entering an isolation room should be limited.

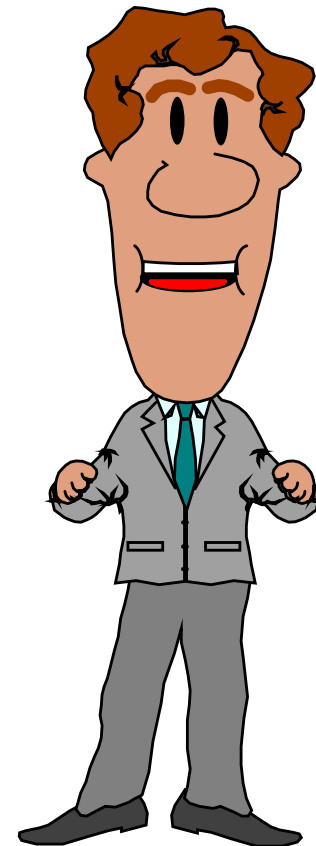
# Isolation Rooms

- ☞ When isolation rooms are in use, the air flow must be checked daily.
- ☞ Isolation rooms with negative pressure at GBMC are located throughout the hospital.



# What factors contribute to TB outbreaks in healthcare facilities?

- ☞ Lack of compliance with infection control practices to control the transmission of TB.
- ☞ Healthcare facilities which are providing services to increased numbers of people with TB and HIV infection.



# **What factors contribute to TB outbreaks in healthcare facilities?**



- ☞ Multi-drug resistant TB cases are on the rise.
- ☞ Lack of using a respirator mask when taking care of patients with active TB.
- ☞ Lack of suspicion that some patients are at risk for TB.

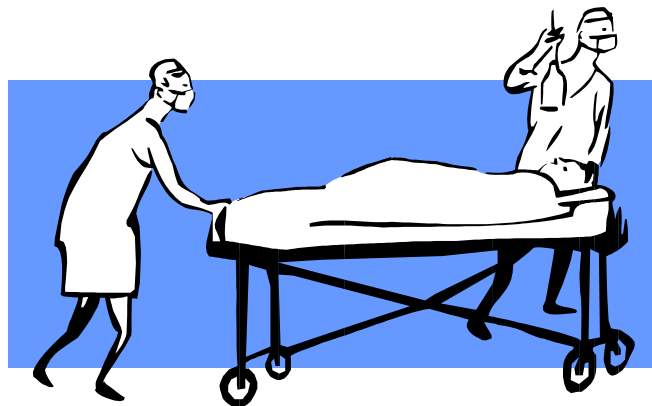
# As a healthcare worker, how can I protect myself from being exposed?

- ☞ Have your skin test performed at least once a year to determine your TB status.
- ☞ Always wear personal protective equipment (N95) when taking care of patients with active or suspected TB. Personal protective equipment includes a respirator (N95) and may include a gown and gloves.



# **As a healthcare worker, how can I protect myself from being exposed?**

☞ Instruct your patients to cover their mouth when coughing and do not transport patients with TB throughout the hospital unless they are wearing a mask.



# As a healthcare worker, how can I protect myself from being exposed?

🌀 Protect yourself in the community by being more aware of the disease and its transmission.



🌀 Patients with active TB or suspected of having TB should be placed in an isolation room until it is determined that this is no longer necessary.

# Occupational Health & Safety Protocols for Monitoring TB

- ☞ All applicants are screened for TB.
- ☞ All employees are screened annually for TB, or more frequently if necessary.
- ☞ Employees exposed to patients with active TB will be identified and followed through Employee Health.





# Fit Testing for N95 respirators

## What is Fit testing and why must it be done?

- ☞ Fit testing determines whether a healthcare worker can achieve an adequate facial seal with a particular respirator. (N95)
- ☞ An appropriately fitted respirator (mask) will prevent the transmission of TB to the healthcare worker.



# Fit Testing

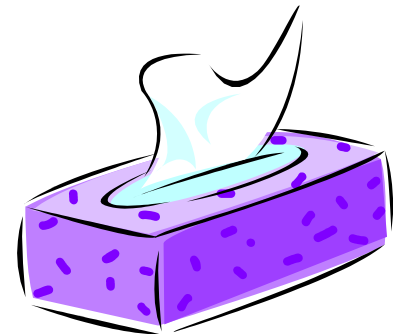
## What is Fit testing and why must it be done?

- ☞ Fit testing must be done prior to the initial use of a respirator mask.
- ☞ Each time a respirator is worn the healthcare worker should ensure it fits tightly over the nose and mouth.



# Patient Education

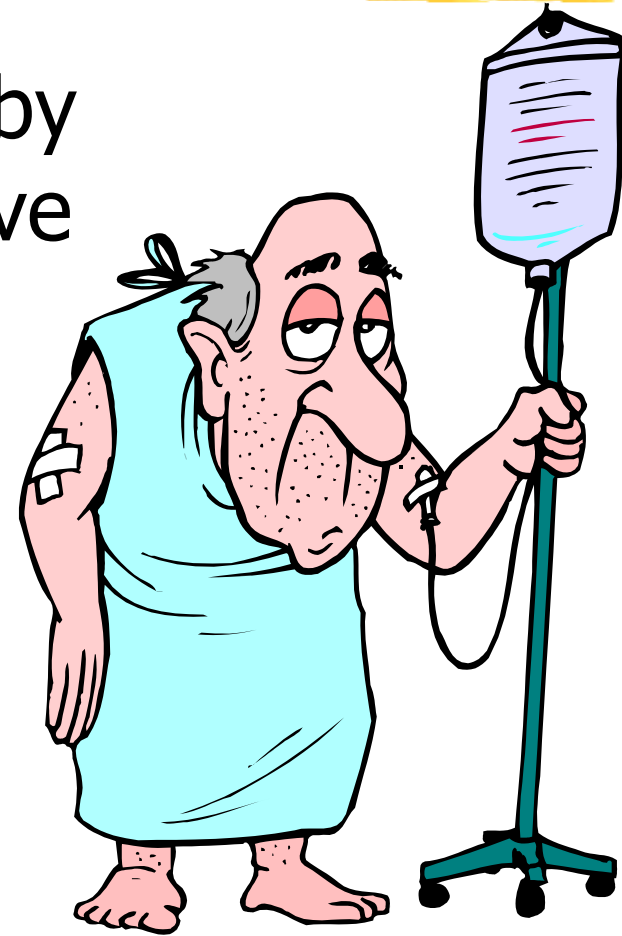
- ☞ Patient education is an essential component to prevent the spread of TB.
- ☞ TB patients should be taught to use tissues to cover coughs and sneezes.
- ☞ Tissues should be disposed appropriately and not left on counter tops.



# Patient Education

☞ A surgical mask must be worn by a TB patient whenever they leave the isolation room.

☞ Visitors of a TB patient must wear a respirator but are not required to be tested.



# Even if a Skin Test is Negative.....

