



The transmission is determined

- The probability of contact with a case of TB —
- The intimacy and duration of that contact —
- The degree of infectiousness of case —
- The shared environment of the contact —

Determinants of Infectivity

- Coughing, sneezing
 - Poor ventilation
- Cavitory disease, untreated
 - Can be 10^9 bacilli
- Sputum smears positive
 - Longer exposure (1 hr = 1/4 to 1/600)

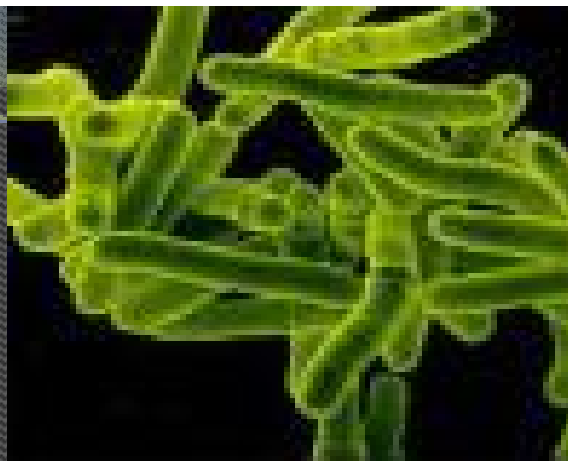
Diagnosis:

A- TESTS:

- *CXR
- *general: CBP, ESR, CRP, ETC....
- *TST
- *stain (Ziehl-Neelsen & auramine fluorescence).
- *PCR
- *culture, solid(Lowenstein-Jensen, middle brook) & liquid(BACTEC).
- *Empirical Anti TB(usually seen after 5-10 days).

B- Specimen:

- *respirotery: sputum, gastric washing, bronchoalveolar lavage, transbronchial biopsy.
- *non-respirotery: fluid examination(CSF, ascitis, pleural, pericardial, joint).
Tissue biopsy(pleural, pericardial, bone marrow, liver).
- *5000-10000 acid-fast bacilli stain become +ve.
- *only 10-100 viable organisms for sputum culture +ve.
- *if MDRTB is suspected, molecular tool may be used to test presence of the rpo gene 95%.



CXR

*Chest radiography is the most important — method to detect TB

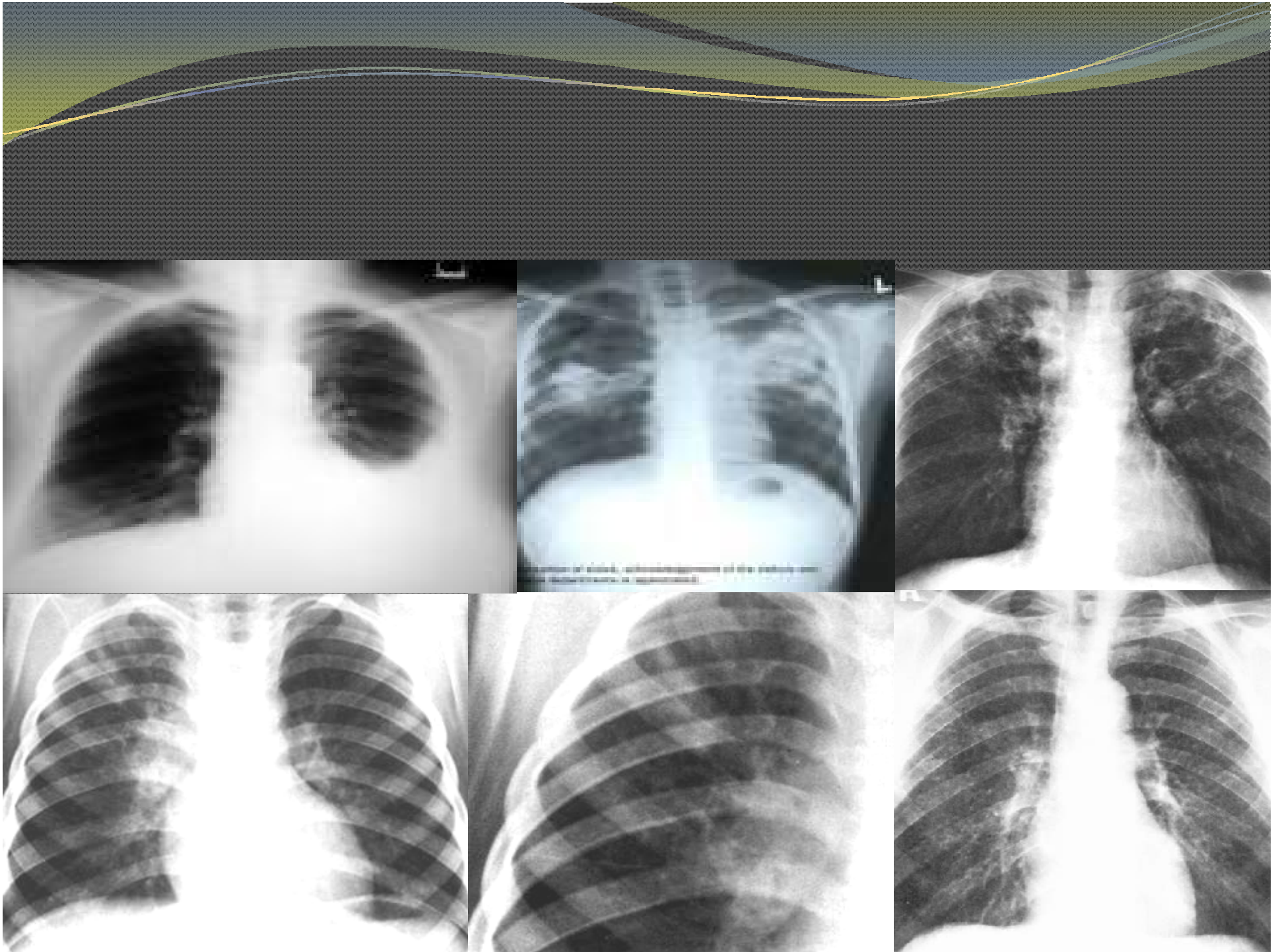
*TB's characteristics of a chest radiograph — favor the diagnosis of tuberculosis as following :

- (1) shadows mainly in the upper zone
- (2) patchy or nodular shadows
- (3) the presence of a cavity or cavities, although these, of course, can also occur in lung abscess, carcinoma, etc

(4) the presence of calcification. although a carcinoma or pneumonia may occur in an areas of the lung where there is calcification due to tuberculosis

(5) bilateral shadows, especially if these are in the upper zones

(6) the persistence of the abnormal shadows without alteration in an x-ray repeated after several weeks this helps to exclude a diagnosis of pneumonia or other acute infection



() Tuberculin Skin Test (TST):

1- Heaf test (tine test): multiple puncture technique, which reads at 3-7 days as:

Grade 1: 4-6 discrete papules.

Grade 2: confluent papules forming ring.

Grade 3: central induration.

Grade 4: > 10 mm induration.

2- Mantoux test: 10 tuberculin units of purified protein in 0.1 ml normal saline intradermally in flexor aspect of the forearm, read at 2-4 days as:

+ve when induration 5-14 mm (G2 Heaf), > 15 mm (G3-4 Heaf).



The false -ve tests occur in :

- *sever TB.
- *HIV
- *malnutrition
- *malignancy
- *newborn & elderly.
- *recent infection(measles) & immunization.
- *immunosuppression.
- *sarcoidosis.

The false +ve tests occur in:

- *BCG
- *areas where exposure is high.

These limitations may be overcome by the development of whole gamma-interferon assays as early secretory antigenic target(ESAT-6)

CONTROL & PREVENTION:

BCG is a live attenuated vaccine derived from *M. bovis* used for:

- *stimulate protective immunity
- *Calcium bladder

it is indicated in:

- 1-contact < 2 years old.
- 2- immigrant from countries where TB is endemic.
- 3- infants in high-prevalence ethnic groups.
- 4- health-care workers at high risk

It is not effective at preventing "secondary" TB or reactivation of TB from the latent state.



Occasional complications:

bladder infection, dysurea, polyurea, hematuria, prostatitis, flu-like illness, local skin BCG abscess, dissemination infection, shock in immunocompromised.

BCG contraindicated in:

- 1- HIV +ve.
- 2- burn.
- 3- TST +ve.



Chemoprophylaxis:

refampicin & INH for 3 months or INH alone for 6 months.

Indicated in:

- 1- documented new TST conversion over past 2 years.
- 2- tuberculin- positive contacts of patients with active TB.
- 3- tuberculin-negative contacts of patients with active TB.
- 4- tuberculin-positive persons with HIV.
- 5- +ve TST of unknown duration in patients younger than 35 years.
- 6- CXR with inactive TB.
- 7- TST +ve with DM, gastrectomy, silicosis, CS, alcoholism.

0 Chemotherapy:

A-regimes:

- *initial phase(rapidly reduce bacterial population).
- *continuation phase(destroy any remaining bacteria).
- *6 month therapy : for *all patients with new-onset
 - *uncomplicated pul or extra-pulm TB.
- *9-12 months: for *HIV +ve.
 - *drug intolerance.
 - *meningitis.
- *after 2 weeks of starting Anti TB, the patient become non-infectious.
- *()smear –ve pul TB AS:
initial phase---2M H3,R3,Z3,E3 continuation-----4M H3,R3.
- *() in relapse or Rx failure:
initial phase---2M H3,R3,E3,S3 continuation---5M H3,R3,E3.
- *()in extrapulmonary TB:
initial phase---2M H3,R3,Z3,E3 OR S3 continuation---4M H3,R3

()Drugs:

1st line: rifampicin, isonizide, pyrazinamide, ethambutol, streptomycin.

2nd: Na-p-aminosalicylate, ethionamide, prothionamide, capreomycin, cycloserine, ciprofloxacin, clarithromycin, amikacin, kanamycin.

*when start Rx should do:

1-base line LFT.

2- RFT.

3- optic disc examination.

4- HIV test.

*CS indicated in :

1- miliary TB 2- Meningeal 3- TB pericarditis 4- TB pleural effusion

5- TB of ureter 6- children with endobronchial disease 7- HIV

8- severe pul TB. 9- drug hypersensitivity.

()surgery: massive hemoptysis, loculated empyema, constrictive pericarditis, LN suppuration, spinal cord disease.

DOTS: (1995)

Directly observed therapy , in which :

- *supervised therapy.
- *2 to 3 times per week.
- *improve adherence & control of TB.
- *currently recommended for :
homeless, alcohol , drug users, mentally ill patients,
history of non-compliance.



Q Complications:

A-pulmonary:

- *massive hemoptysis
- *aspergilloma
- *bronchiectasis
- *cor pulmonale
- *lung/pleural calcification.
- *fibrosis/emphysema
- *bronchopleural fistula.

B- Non-pulmonary:

- *empyema necessitans
- *laryngitis
- *enteritis
- *anorectal disease
- *amyliodosis
- *poncet's arthropathy



TB and HIV

- TB infection in 3-30% of HIV
 - Depending on geographic area, socioeconomic factors
- TB can manifest in early HIV
 - Versus other “opportunistic” infections
- Risk of recrudescence 8% per year!
- Prophylaxis (1 yr INH) effective

“Atypical” Mycobacteria

- M. tuberculosis
 - Person-to-person
 - High virulence
 - PPD +
 - Susceptible to drugs
- “Atypicals”
 - From environment
 - Lower virulence (most)
 - PPD –
 - Not the usual TB drugs

Recrudescent TB

- Occurs in 4-8% of infected
 - About half the risk in first year
- Most common site: apex of lung
 - Because of high pO_2 ?
- Other sites: anywhere
 - Esp GU, bone, meninges

Favoring Recrudescence

- Weakening of CMI
 - Steroids
 - HIV (8% per year!)
 - Viral infection
 - Lymphoma, sarcoidosis
 - Alcoholism
 - Old age!

