Tuberculosis

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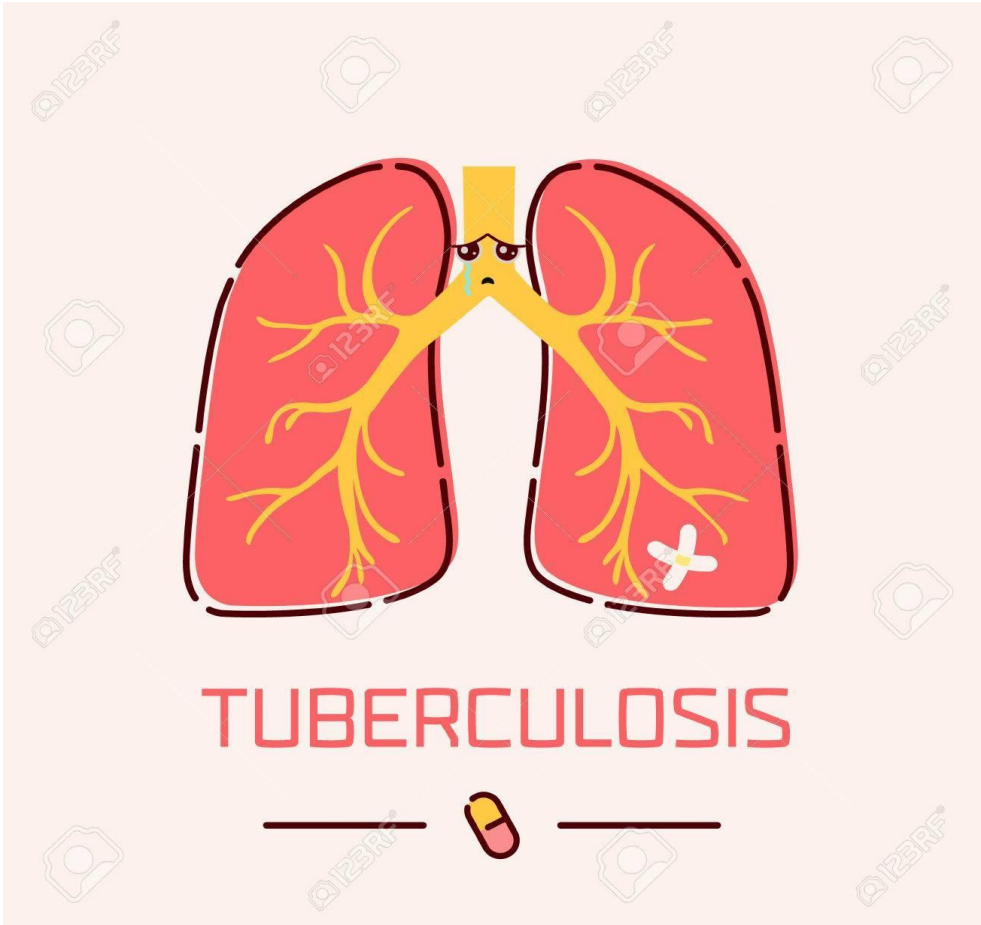
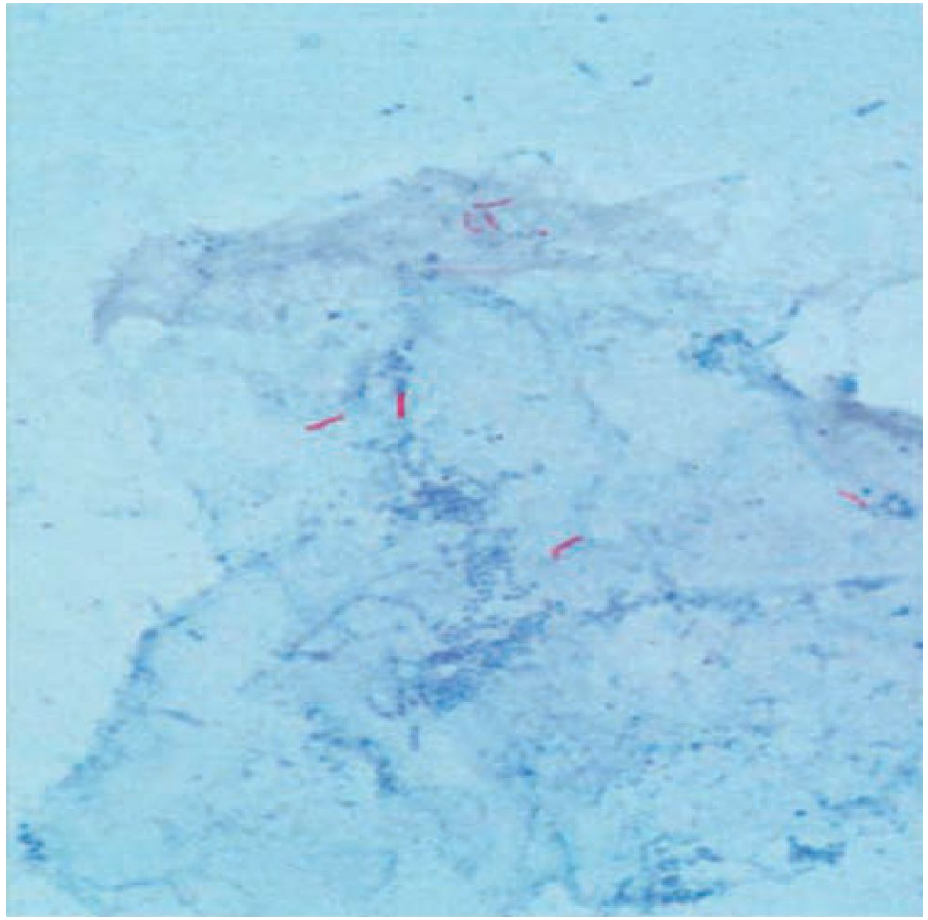
Tuberculosis (TB), which is caused by bacteria of the *Mycobacterium tuberculosis* complex, is one of the oldest diseases known to affect humans and the top cause of infectious death worldwide.



- If properly treated, TB caused by drug-susceptible strains is curable in the vast majority of cases. If untreated, the disease may be fatal within 5 years in 50–65% of cases.
- In 2016, 6.3 million new cases of TB (all forms, both pulmonary and extrapulmonary) were reported to the World Health Organization (WHO) by its member states; 95% of cases were reported from developing countries
- The countries of the former Soviet Union have reported the highest proportions of MDR disease among new TB cases (up to 35% in some regions of Russia and Belarus).

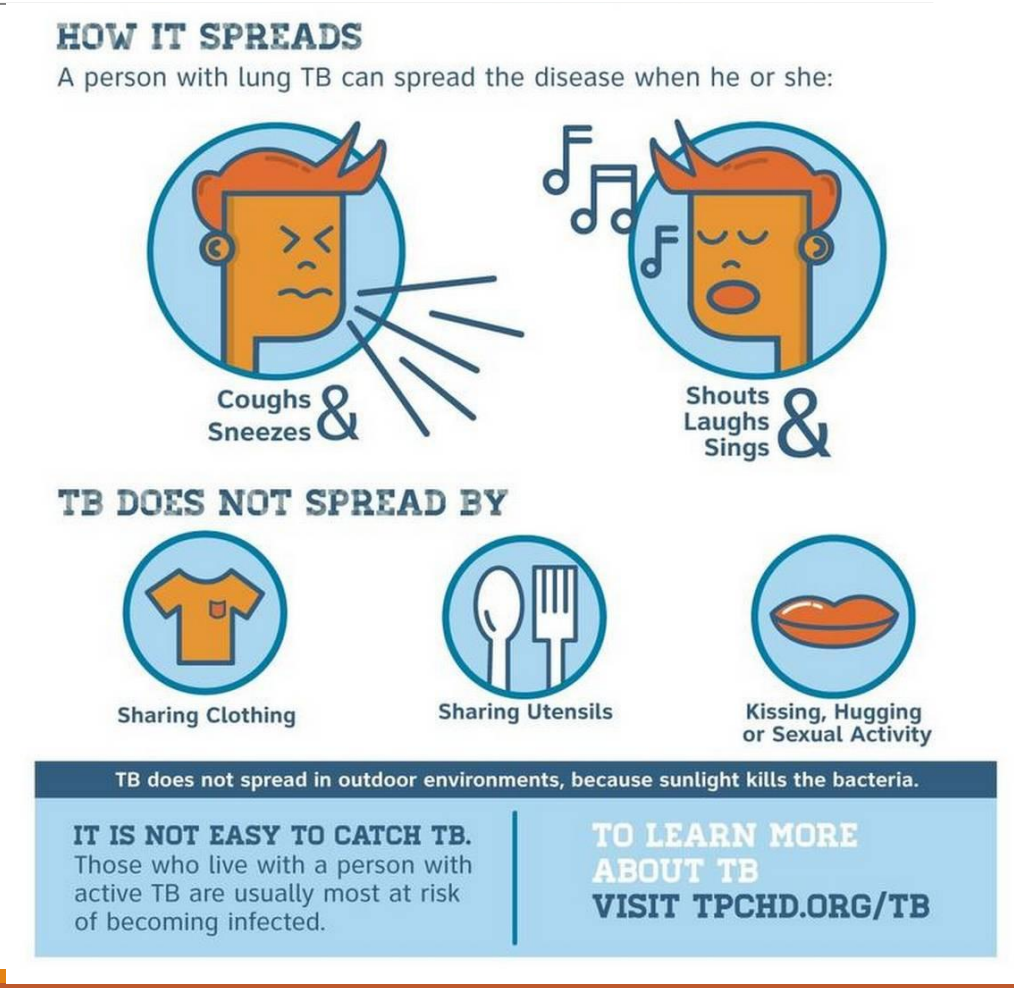
Mycobacterium tuberculosis

- *M. tuberculosis* is a rod-shaped, non-spore-forming, thin aerobic bacterium measuring 0.5 µm by 3 µm.
- Mycobacteria, including *M. tuberculosis*, are often neutral on Gram's staining. However, once stained, the bacilli cannot be decolorized by acid alcohol; this characteristic justifies their classification as acid-fast bacilli



Transmission and infection

Transmission usually takes place through the airborne spread of droplet nuclei produced by patients with infectious pulmonary TB.



- Most infectious patients:
  - Cavitary pulmonary disease or, much less common, laryngeal TB
  - Patients with positive sputum smear (bacilli visible by microscopy)
- Less infections patients:
  - Persons with both HIV infection and TB (are less likely to have cavitations)
  - Patients with negative sputum smear/culture positive TB
- Noninfectious.
  - Those with culture-negative pulmonary TB
  - Extrapulmonary TB

Natural history of the disease

- 10% of infected persons will eventually develop active TB in their lifetime - half of them during the first 18 months after infection
- The risk of developing disease after being infected depends largely on endogenous factors, such as the individual's innate immunologic and nonimmunologic defenses and the level at which the individual's cell-mediated immunity is functioning.

- TB is classified as pulmonary, extrapulmonary, or both. Depending on several factors linked to different populations and bacterial strains, extrapulmonary TB may occur in 10-40% of patients.
- Up to two-thirds of HIV -infected patients with TB may have both pulmonary and extrapulmonary TB or extrapulmonary TB alone.
- Pulmonary TB is classified further into primary and secondary

Pulmonary TB

Primary Pulmonary TB

- Clinical illness directly following infection.
- Is common among children and immunocompromised persons.
- May be severe and disseminated, not associated with high-level transmissibility.
- When infection is acquired later in life, the chance is greater that the mature immune system will contain it at least temporarily.

Symptoms

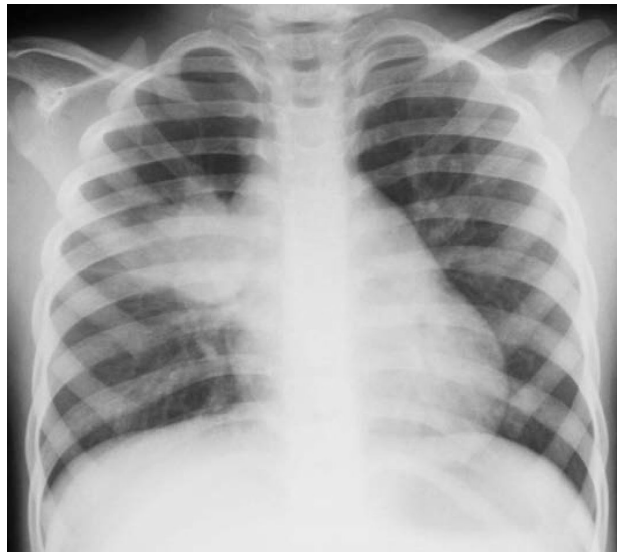
- May be asymptomatic or may present with fever and occasionally pleuritic chest pain.
- Most commonly involved in primary TB middle and lower lung zones.
- The lesion forming after initial infection (Ghon focus) is usually peripheral and accompanied by transient hilar or paratracheal lymphadenopathy, which may or may not be visible on standard chest X ray.
- In the majority of cases, the lesion heals spontaneously and becomes evident only as a small calcified nodule. Pleural reaction overlying a subpleural focus is also common.
- Ghon complex = The Ghon focus + pleural reaction + regional limphadenopathy
- Some patients develop erythema nodosum on the legs or conjunctivitis

- In young children and in persons with impaired immunity (e.g. malnutrition or HIV), primary pulmonary TB may progress rapidly to clinical illness.
- The initial lesion increases in size and can evolve in different ways. Pleural effusion, which is found in up to two-thirds of cases, results from the penetration of bacilli into the pleural space from an adjacent subpleural focus.
- In severe cases, the primary site rapidly enlarges, its central portion undergoes necrosis, and cavitation develops (progressive primary TB) .

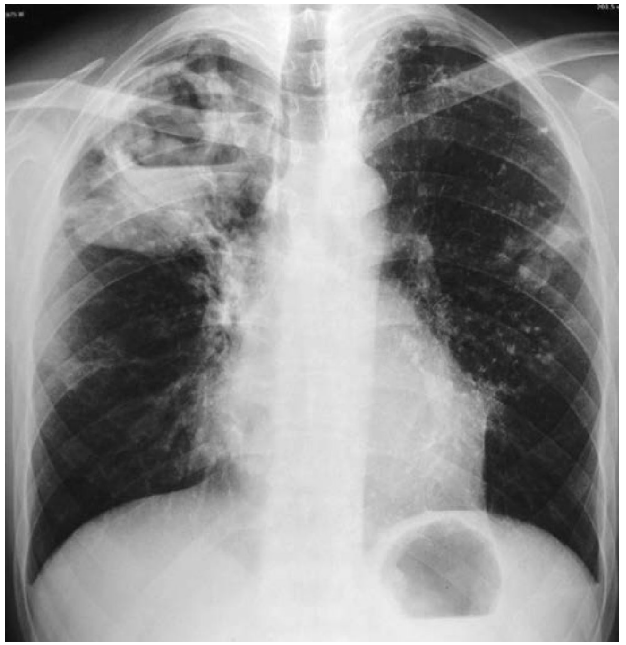
- Bronchiectasis may develop in any segment/lobe damaged by progressive caseating pneumonia.
- Occult hematogenous dissemination commonly follows primary infection. However, in the absence of a sufficient acquired immune response, disseminated or miliary disease may result. Small granulomatous lesions develop in multiple organs and may cause locally progressive disease or result in tuberculous meningitis.

Chest X-ray

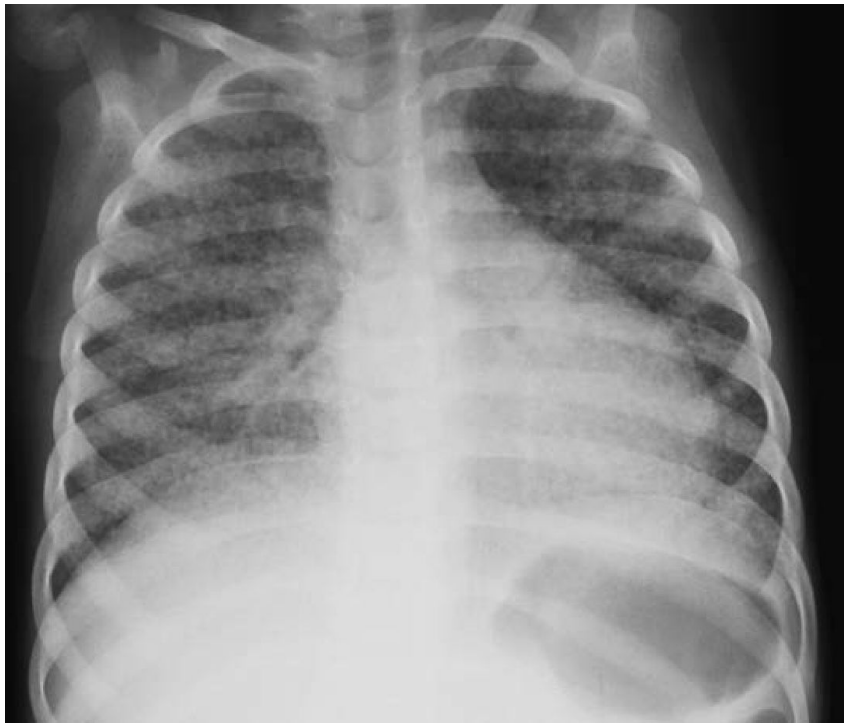
CHEST RADIOGRAPH SHOWING RIGHT HILAR LYMPH NODE ENLARGEMENT WITH INFILTRATION INTO THE SURROUNDING LUNG TISSUE IN A CHILD WITH PRIMARY TUBERCULOSIS.



CHEST RADIOGRAPH SHOWING A RIGHT-UPPER-LOBE INFILTRATE AND A CAVITY WITH AN AIR-FLUID LEVEL IN A PATIENT WITH ACTIVE TUBERCULOSIS.



CHEST RADIOGRAPH SHOWING BILATERAL MILIARY (MILLET-SIZED) INFILTRATES IN A CHILD.

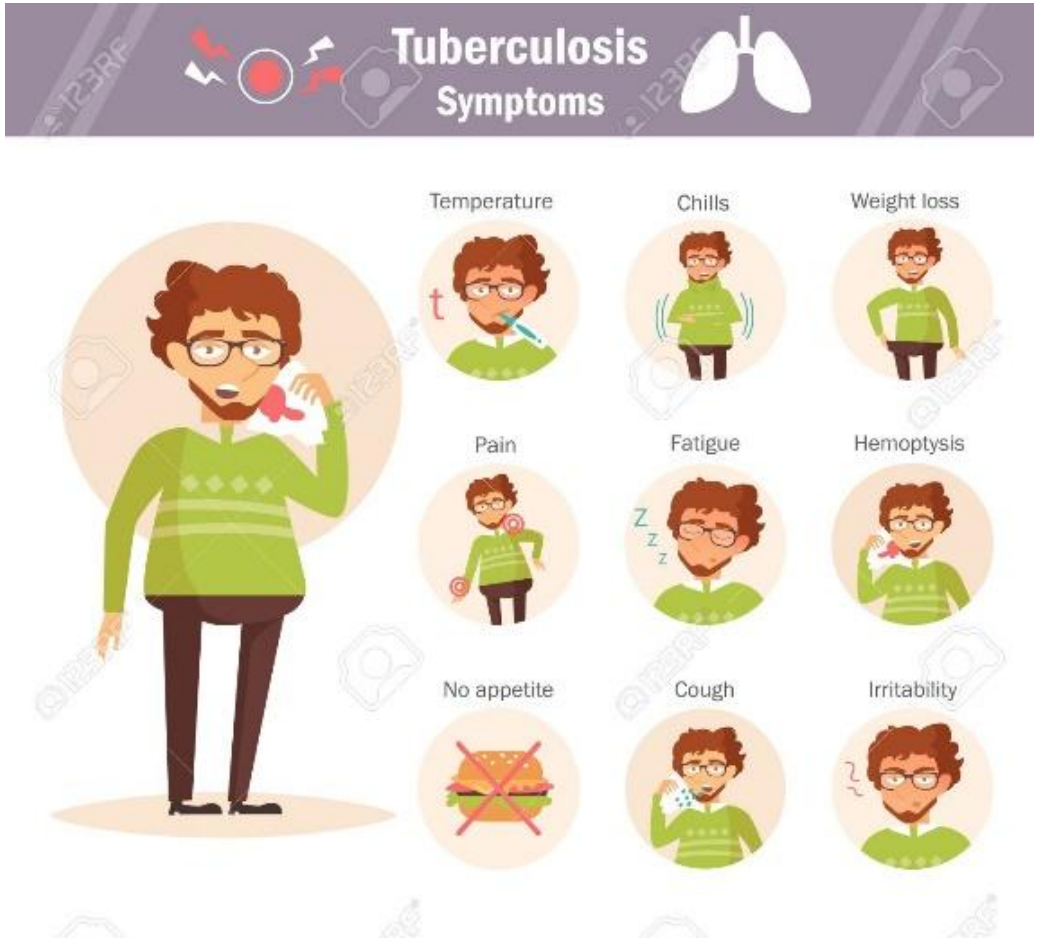


Secondary Pulmonary TB

- Bacilli may reactivate after many years because of frequent cavitation, is more often infectious than is primary disease
- May result from endogenous reactivation of latent TB or recent infection
- Usually localized to the apical and posterior segments of the upper lobes.
- Small infiltrates; extensive cavities; liquefied necrotic contents can discharged into the airways and may undergo bronchogenic spread, resulting in satellite lesions within the lungs that may in turn undergo cavitation.

Symptoms

- Early in the course of disease symptoms and signs are often nonspecific:
  - fever, chills, night sweats,
  - weight loss, anorexia,
  - general malaise and weakness.
- In up to 90% of cases, cough eventually develops-often initially nonproductive and limited to the morning and subsequently accompanied by the production of purulent sputum, sometimes with blood streaking.


Tuberculosis
Symptoms
Temperature
Chills
Weight loss
Pain
Fatigue
Hemoptysis
No appetite
Cough
Irritability

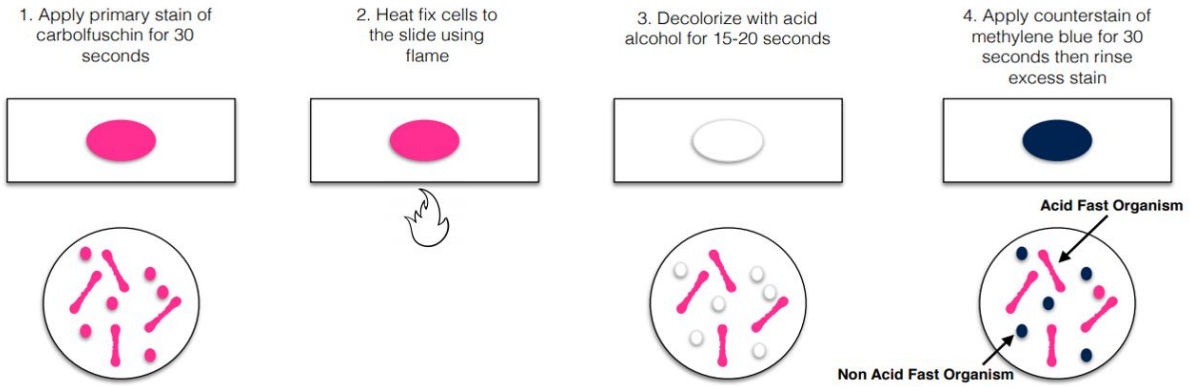
- Hemoptysis develops in 20-30% of cases, and massive hemoptysis may ensue as a consequence of the erosion of a blood vessel in the wall of a cavity. Hemoptysis may also result from rupture of a dilated vessel in a cavity (Rasmussen 's aneurysm) or from aspergilloma formation in an old cavity.
- Pleuritic chest pain sometimes develops in patients with subpleural parenchymal lesions or pleural disease. Extensive disease may produce dyspnea
- In some cases, pallor and finger clubbing develop.

Diagnosis

- Physical findings are of limited use in pulmonary TB.
- The most common hematologic findings are mild anemia, leukocytosis, and thrombocytosis with a slightly elevated ESR and CRP.
- If the patient has no complicating medical conditions that cause immunosuppression, the chest radiograph may show typical upper-lobe infiltrates with cavitation. The longer the delay between the onset of symptoms and the diagnosis, the more likely is the finding of cavitary disease. Additional finings: pleural effusion, hilar node enlargement or adenopathy.

Acid-Fast Bacillus Microscopy

- Low sensitivity (40-60%) in culture-confirmed cases of pulmonary TB.
- Ziehl-Neelsen basic fuchsin dyes or auramine–rhodamine staining and fluorescence microscopy;
- For patients with suspected pulmonary TB, it has been recommended that 2-3 sputum specimens, preferably collected early in the morning, should be submitted to the laboratory for AFB smear and mycobacterial culture.



This is a diagram of the basic steps of a Ziehl-Neelsen (Acid Fast) staining procedure.

ACID-FAST STAIN

IMAGE Courtesy of Elizabeth Gray. https://en.wikipedia.org/wiki/File:Acid_Fast_Stain.pdf

Gene Xpert

- Fully automated amplification of mycobacterial nucleic acid (DNA PCR)
- Most useful for the rapid confirmation of TB in persons with AFB positive specimens, can also be used in AFB-negative patients
- The WHO recommends its use worldwide as the initial diagnostic test for patients presumed to have MDR-TB or HIV-associated TB
- Xpert MTB/RIF can simultaneously detect TB and rifampin resistance in <2 h
- Xpert MTB/RIF should be the initial test applied to CSF, nonrespiratory specimens-obtained by gastric lavage, fine-needle aspiration, or pleural or other biopsies from patients in whom extrapulmonary TB is suspected.

Mycobacteria culture

- A low-cost
- Definitive diagnosis
- MGIT cultures usually become positive after a period ranging from 10 days to 2–3 weeks; the tubes are read weekly until the eighth week of incubation before the result is declared to be negative.

Drug Susceptibility testing

- Any initial isolate of M. tuberculosis should be tested for susceptibility to isoniazid and rifampin in order to detect drug resistance and/or MDR-TB
- Expanded susceptibility testing for second-line anti-TB drugs (especially the fluoroquinolones and the injectable drugs) is mandatory when MDR-TB is found.

HIV-ASSOCIATED TB

- Likely main cause of infectious-related death in this population
- If CD4 is low (less than 200) may present as primary pulmonary TB
- Sputum smear is usually negative (40%)
- The standard 6-month daily regimen is equally efficacious in HIV-negative and HIV-positive patients for treatment of drug-susceptible TB.
- Interactions between ART components and rifamycins (P450) should be considered
- Initiation of ART should be delayed in naïve patients with CD4 counts >50 cells/µL until 2–4 weeks following the initiation of treatment for TB.
- For patients with lower CD4 counts the benefits of more immediate ART outweigh the risks of IRIS.

Treatment

- The two main aims of TB treatment:
  - to prevent morbidity and death by curing TB while preventing the emergence of drug resistance
  - to interrupt transmission by rendering patients noninfectious to others.

First-line agents for the treatment of TB:

- Isoniazid (H) – s/e liver toxicity, peripheral neuropathy (should be administered with pyridoxine)
- Rifampin (R) – s/e rare, liver toxicity, pinkish/orange urine
- Pyrazinamide (Z) - s/e rare, liver toxicity, hyperuricemia
- Ethambutol (E) – s/e optic neuritis

Before treatment initiation:

- Baseline LFT's
- Test for visual acuity, visual fields, and color vision, optic fundus

Treatment regimen

- Divided into 2 phases:
  - An initial, or bactericidal phase - the majority of the tubercle bacilli are killed, symptoms resolve, and usually the patient becomes noninfectious. More than 80% of patients will have negative sputum cultures at the end of the second month of treatment.
  - Continuation, or sterilizing phase - phase is required to eliminate persisting mycobacteria and prevent relapse.

TABLE 173-3 Recommended Antituberculosis Treatment Regimens

	INITIAL PHASE		CONTINUATION PHASE	
INDICATION	**DURATION, MONTHS**	**DRUGS**	**DURATION, MONTHS**	**DRUGS**
New smear- or culture-positive cases	2	HRZE[a,b]	4	HR[a,c]
New culture-negative cases	2	HRZE[a]	4	HR[a,d]
Pregnancy	2	HRE[e]	7	HR
Relapses and treatment default[f]	← Tailored according to rapid drug susceptibility testing →			
Failures[f]	← Tailored according to rapid drug susceptibility testing →			
Resistance (or intolerance) to H	Throughout (6)	RZEQ		
Resistance (or intolerance) to R	← Same as for MDR-TB; see below →			
MDR-TB (resistance to at least H + R)	← See Fig. 173-12 and Table 173-4 →			
XDR-TB	← See Table 173-4 →			
Intolerance to Z	2	HRE	7	HR

- Patients with pulmonary disease should have their sputum examined monthly until cultures become negative to allow early detection of treatment failure. By the end of the 3-rd month, the sputum of virtually all patients should be culture negative.
- Patients with cavitary disease in whom sputum culture conversion does not occur by 2 months require immediate testing for drug resistance.
- When a patient's sputum cultures remain positive at >3 months:
  - Treatment failure and drug resistance
  - Poor adherence to the regimen are likely.

Treatment failure and relapse

- Current isolate must be urgently tested for susceptibility to first- and second-line agents.
- When the results of susceptibility testing are based on molecular methods and are expected to become available within a few days, changes in the regimen can be postponed until that time.
- If the patient's clinical condition is deteriorating, an earlier change in regimen may be indicated .
- A cardinal rule is always to add more than one drug at a time to a failing regimen: at least two and preferably three drugs that have never been used and to which the bacilli are likely to be susceptible should be added.

MDR-TB treatment

For the treatment of patients with isoniazid-resistant disease, it is recommended to use a combination of rifampin, ethambutol, pyrazinamide, and levofloxacin for 6 months.

MDR-TB, in which bacilli are resistant to (at least) isoniazid and rifampin:

- 3 agents from group A
- Two agents from Group A and both from Group B
- Five effective antibiotics

In 2013 and 2014, respectively, bedaquiline and delamanid—the first two drugs specifically developed for TB during nearly half a century—received conditional approval by the FDA for 18- to 24-month WHO-recommended regimen for MDR-TB in selected cases.

Table 3.1. Grouping of medicines recommended for use in longer MDR-TB regimens[a]

Groups and steps	Medicine	Abbreviation
Group A: Include all three medicines	Levofloxacin *or* moxifloxacin	Lfx Mfx
	Bedaquiline[b,c]	Bdq
	Linezolid[d]	Lzd
Group B: Add one or both medicines	Clofazimine	Cfz
	Cycloserine *or* terizidone	Cs Trd
Group C: Add to complete the regimen and when medicines from Groups A and B cannot be used	Ethambutol	E
	Delamanid[e]	Dlm
	Pyrazinamide[f]	Z
	Imipenem–cilastatin *or* meropenem[g]	Ipm–Cln Mpm
	Amikacin (*or* streptomycin)[h]	Am (S)
	Ethionamide *or* prothionamide[i]	Eto Pto
	P-aminosalicylic acid[i]	PAS

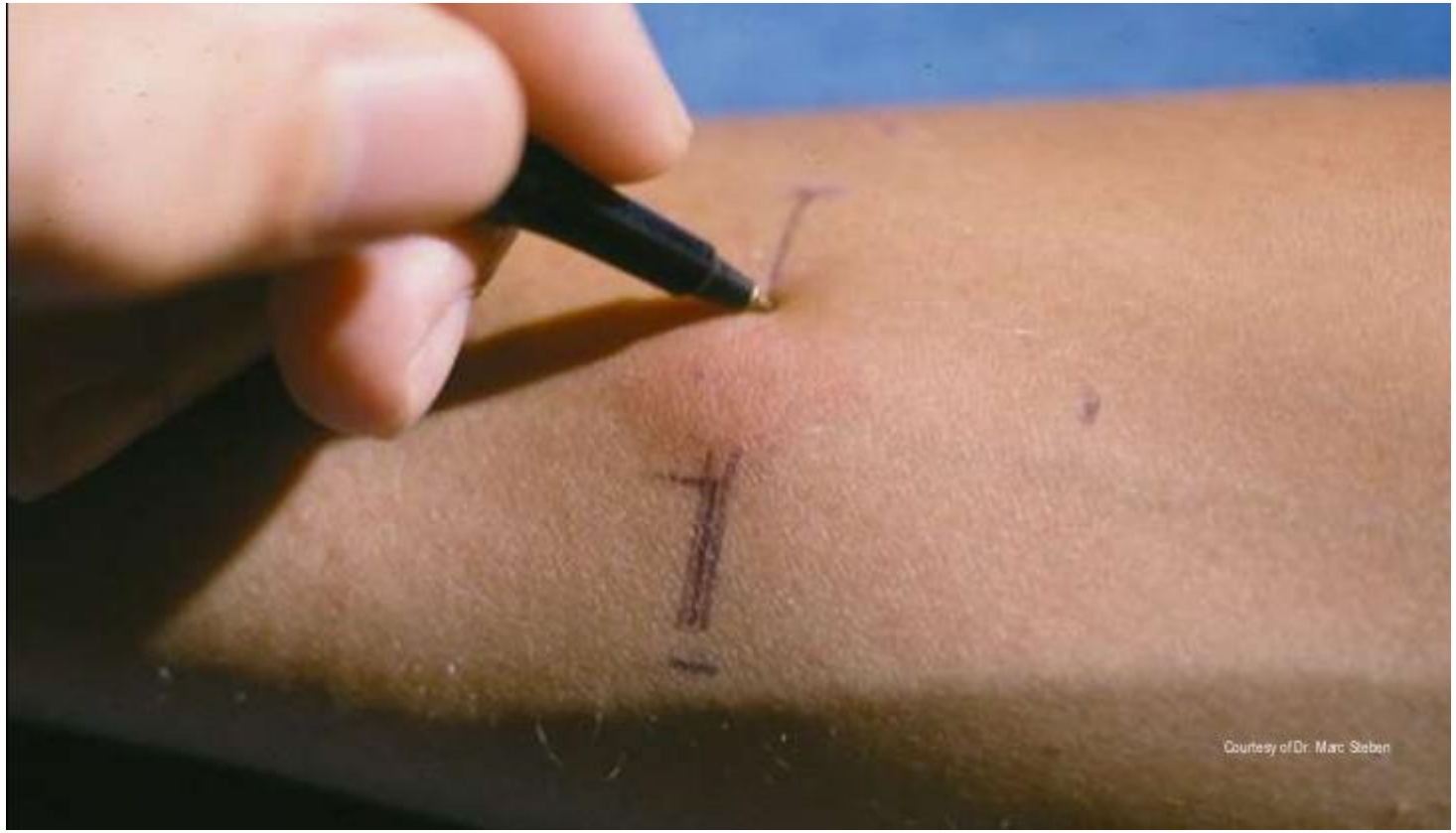
Latent TB Infection (LTBI)

Latent vs. active TB: usual hallmarks

Latent TB Infection (LTBI)	Active TB
MTB present	MTB present
Tuberculin skin test/IGRA +	Tuberculin skin test/IGRA +
Normal chest x-ray	Chest x-ray lesion (usually)
Negative sputum smear, culture	Positive sputum smear, culture
No symptoms	Cough, fever, weight loss, other
Not infectious	Infectious before treatment
Not defined as TB case	Defined as TB case

Tuberculin **S**kin **T**esting (Tuberculin **p**urifed **p**rotein **d**erivative (PPD)

- Measures the response to antigenic stimulation by T cells that reside in the skin.
- Limitations :
  - Lack of mycobacterial species specificity (false-positive in non-tb mycobacteria)
  - Subjectivity of the skin-reaction interpretation
  - Low sensitivity and specificity for active disease
  - Unable to discriminate between LTBI and active disease.
  - False-negative reactions are common in immunocompromised
- False-positive reactions:
  - infections with nontuberculous mycobacteria
  - BCG vaccination.

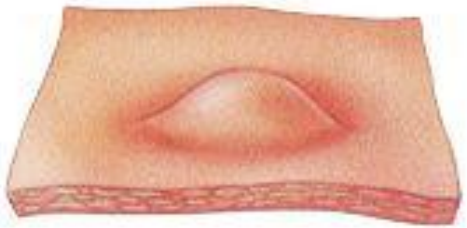

Courtesy of Dr. Marc Steben

≥ 5 mm

- HIV positive
- Recent contact with an active TB patient
- Nodular or fibrotic changes on chest X-ray
- Organ transplant

Immunosupressed (anti TNF, GCS)

≥ 10 mm



- Recent arrivals (< 5 yrs) from high-prevalence countries
- IV drug users
- Resident/employee of high-risk congregate settings
- Mycobacteriology lab personnel
- Comorbid conditions
- Children < 4 yrs old
- Infants, children, & adolescents exposed to high risk categories

≥ 15 mm

- Persons with no known risk factors for TB

IFN- γ Release Assays (IGRA)

- Have usually replaced the TST for LTBI diagnosis in low-incidence, high-income settings with low TB and HIV burdens.
- More specific than the PPD as a result of less cross-reactivity due to BCG vaccination and sensitization by nontuberculous mycobacteria.
- Two in vitro assays that measure T cell release of IFN -γ in response to stimulation with the highly TB-specific antigens:
  - The T-SPOT.TB test (is an enzyme linked immunospot (ELISpot) assay)
  - QuantiFERON-TB Gold test (is a whole-blood enzyme-linked immunosorbent assay (ELISA) for measurement of IFN- γ.

Treatment

TABLE 173-6 Recommended Regimens and Drug Dosages for Treatment of Latent *Mycobacterium tuberculosis* Infection[a]

REGIMEN	DOSE	ADVERSE EVENTS
Isoniazid alone for 6 or 9 months	Adults: 5 mg/kg (max, 300 mg) per day Children: 10 mg/kg per day	Drug-induced liver injury, nausea, vomiting, abdominal pain, skin rash, peripheral neuropathy, dizziness, drowsiness, seizure
Rifampin alone for 3–4 months	Adults: 10 mg/kg per day Children: 10 mg/kg (max: <45 kg, 450 mg; >45 kg, 600 mg) per day	Flu-like syndrome, skin rash, drug-induced liver injury, anorexia, nausea, abdominal pain, neutropenia, thrombocytopenia, renal reactions (e.g., acute tubular necrosis and interstitial nephritis)
Isoniazid plus rifampin for 3–4 months	As above	As above
Rifapentine plus isoniazid for 3 months	Adults and children: Isoniazid: 15 mg/kg (900 mg) weekly Rifapentine: 15–30 mg/kg (900 mg) weekly	Hypersensitivity reactions, petechial skin rash, drug-induced liver injury Anorexia, nausea, abdominal pain Hypotensive reactions

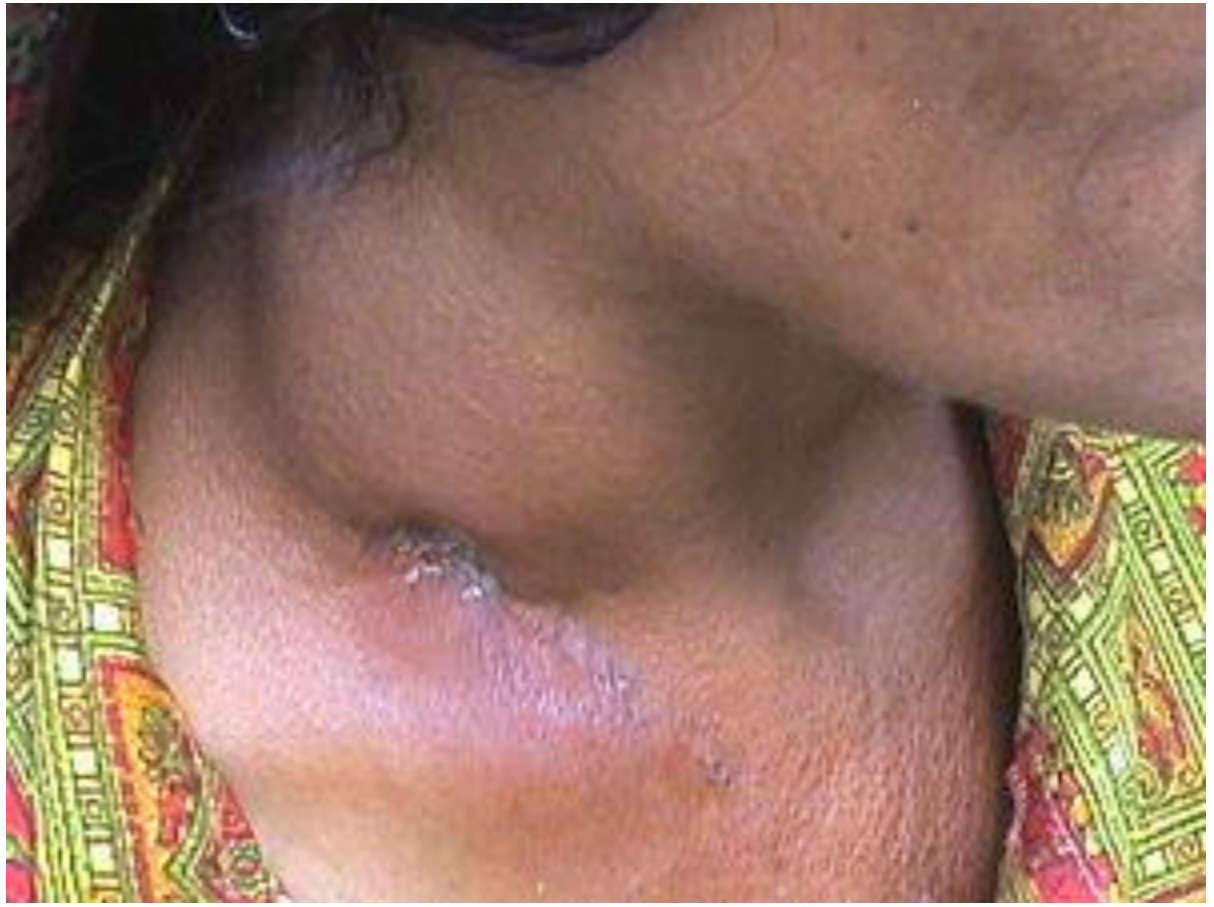
PREVENTION

- The best way to prevent TB is to diagnose and isolate infectious cases rapidly and to administer appropriate treatment until patients are rendered noninfectious (usually 2-4 weeks)
- Vaccination and treatment of persons with LTBI who are at high risk of developing active disease.
- BCG vaccination (prevents disseminated disease)
- Treatment of selected persons with LTBI aims at preventing active disease. A 6-9 month course of isoniazid reduces the risk of active TB ininfected people by up to 90%.

Extrapulmonary TB

Tuberculous Lymphadenitis

- Most commo form of extrapulmonary TB (35-40%)
- Cervical adenopathy
- Peak age of onset of 20 to 40 years
- Patients without HIV infection typically present with chronic, nontender lymphadenopathy.
- Patients with HIV infection usually present with fever, night sweats, and weight loss
- If untreated, the nodes become fluctuant and drain spontaneously with sinus tract formation.
- Excisional biopsy of the lymph nodes with histology, AFB stain, and mycobacterial culture is the diagnostic procedure of choice.



Pleural Tuberculosis

- Cough, pleuritic chest pain, fever, or dyspnea.
- Small to moderate, unilateral pleural effusion
- About 20 % of patients have associated pulmonary lesions.
- Pleural effusion:
  - Exudative with a lymphocyte predominance
  - Pleural fluid glucose usually low and pH can be low or normal.
  - AFB smears are seldom positive (5% of cases) unless the patient has tuberculous empyema.
  - Cultures for M. tuberculosis are positive in less than 40 % of cases, Xpert test sensitivity is very low.
  - ADA and IGRA may be useful
- Pleural biopsy culture or PCR

TB of the Upper Airways

- Nearly always a complication of advanced cavitary pulmonary TB
- May involve the larynx, pharynx, and epiglottis.
- Hoarseness, dysphonia, and dysphagia in addition to chronic productive cough.
- Highly conatgious

Genitourinary TB

- ~10–15% of all extrapulmonary cases
- Urinary frequency, dysuria, nocturia, hematuria, and flank or abdominal pain
- Culture negative pyuria
- Genital TB is diagnosed more commonly in female than in male patients.
- In female patients, it affects the fallopian tubes and the endometrium and may cause infertility, pelvic pain, and menstrual abnormalities.

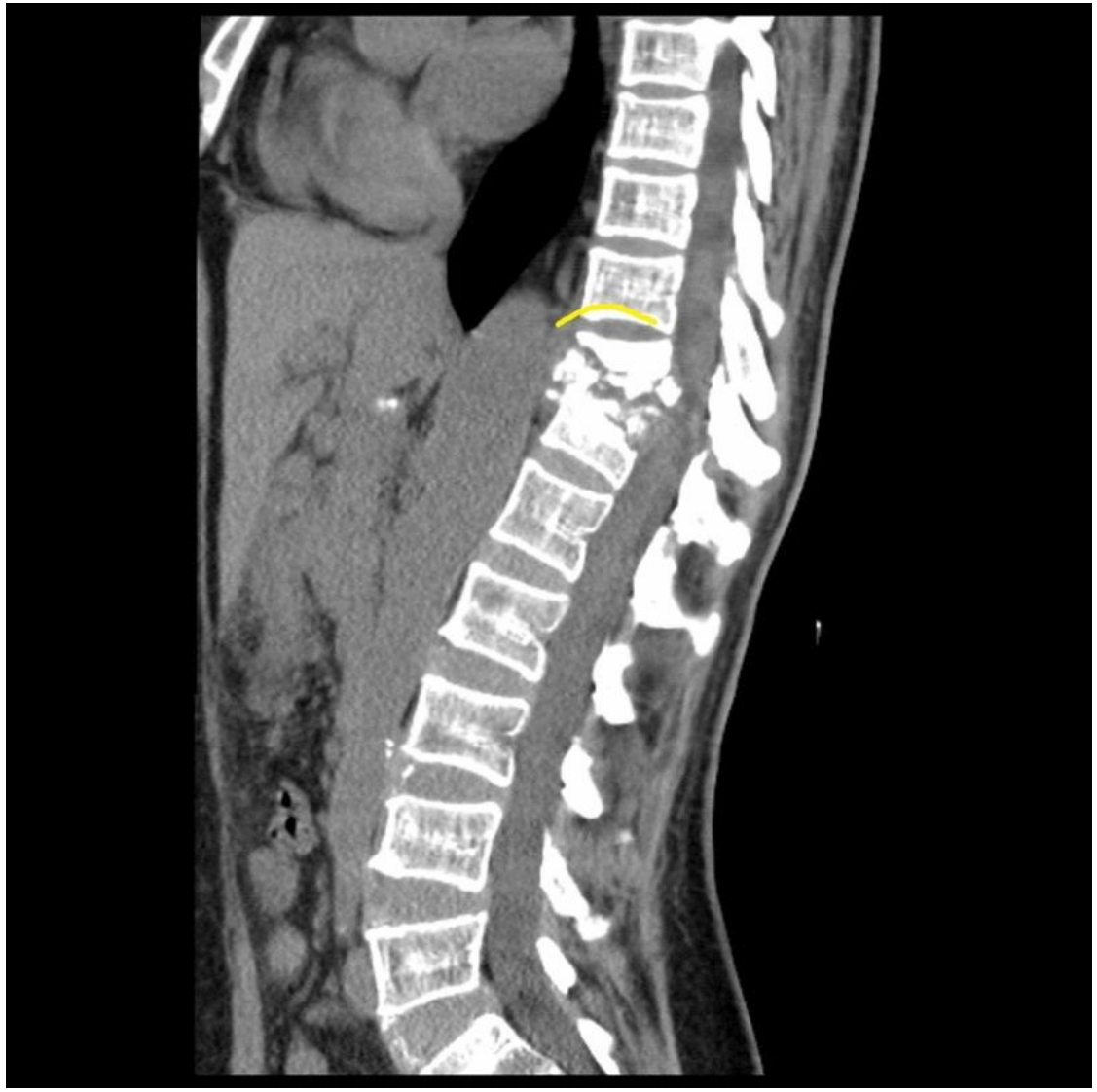
Skeletal Tuberculosis

- ~10% of extrapulmonary cases.
- Most often involves the spine, arthritis in weight-bearing joints and osteomyelitis.
- Spinal tuberculosis (Pott's disease) most commonly involves the thoracic spine

  (destruction of the intervertebral disc with disc space obliteration)

- Paraspinal and psoas abscesses, with extensions to the surface or adjacent tissues .
- Local pain, constitutional symptoms, or paraplegia secondary to cord compression.
- Monoarthritis of the hip or knee

- Surgery may be necessary to drain abscesses, debride infected tissue, or stabilize the spine and relieve spinal cord compression.
- In the absence of neurologic impairment, unstable spine, or spinal cord compression, medical therapy alone should result in an excellent response.

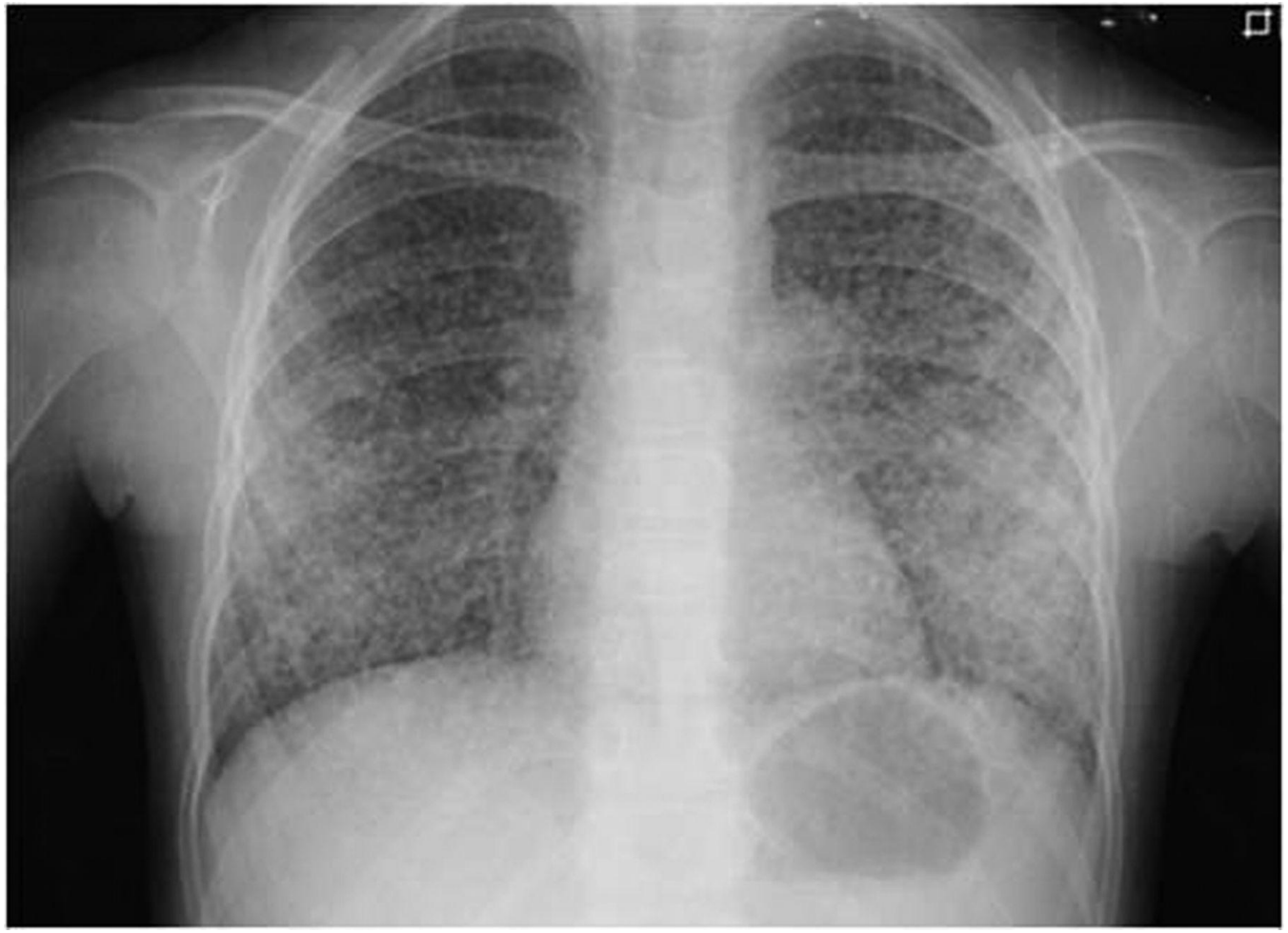


Meningitis

- ~5% of extrapulmonary cases
- Acute or subacute
- Headache and slight mental changes after a pro-drome of weeks of low-grade fever, malaise, anorexia, and irritability
- CSF examination:
  - High Leu count ~ 1000 (lymphocytic predominance)
  - High protein
  - Low glucose
  - Microscopy often negative (PCR/culture important)

MILIARY TUBERCULOSIS

- Any progressive, disseminated form of tuberculosis; the disease can occur during primary dissemination or after years of untreated tuberculosis.
- ~10 % of patients who have AIDS and pulmonary TB , and in 38% of those who have AIDS and extra-pulmonary tuberculosis.
- Fever, chills, night sweats, weight loss, and anorexia. Clinical manifestations depend on the organs involved. Fulminant disease including septic shock, acute respiratory distress syndrome, and multiorgan failure has been described.
- A chest radiograph or CT scan reveals numerous 2- to 3-mm nodules scattered throughout the lung in more than 85 % of patients



THE END TB STRATEGY

VISION	**A world free of tuberculosis** – zero deaths, disease and suffering due to tuberculosis			
GOAL	**End the global tuberculosis epidemic**			
INDICATORS	**MILESTONES**		**TARGETS**	
	2020	**2025**	**SDG 2030***	**END TB 2035**
Reduction in number of TB deaths compared with 2015 (%)	35%	75%	90%	95%
Reduction in TB incidence rate compared with 2015 (%)	20% (<85/100 000)	50% (<55/100 000)	80% (<20/100 000)	90% (<10/100 000)
TB-affected families facing catastrophic costs due to TB (%)	Zero	Zero	Zero	Zero

* The United Nations is in the process of defining a post-2015 development agenda. A set of "Sustainable Development Goals" (SDGs) are being developed for 2030; TB is proposed to be part of the agenda and goals.

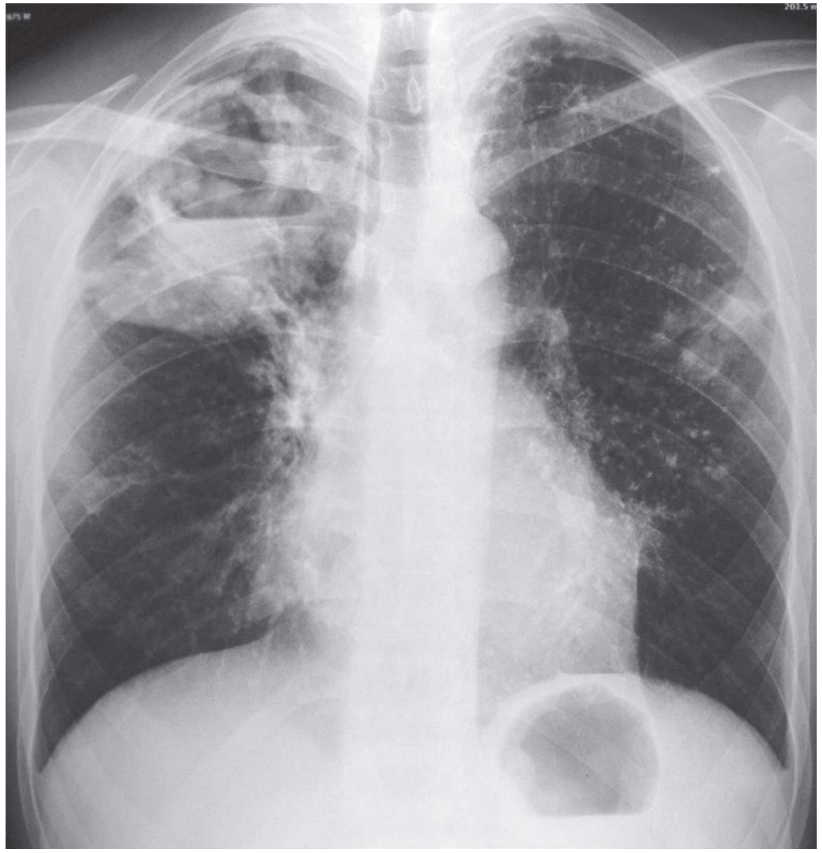
THANK YOU!

QUESTIONS

Перед вами представлены факторы повышающие вероятность передачи активного туберкулеза, все ответы верны КРОМЕ:

a) Продолжительность контакта с зараженным человеком
b) Среда, в которой происходит контакт
c) Наличие экстрапульмонарного туберкулеза
d) Наличие гортанного туберкулеза
e) Вероятность контакта с заразным человеком

42-летний мужчина из Нигерии приезжает в отделение реанимации из-за высокой температуры, усталости, потери веса и кашля в течение 3 недель. Он жалуется на выскоую температуру и потерю веса до 4.5 кг. Он говорит что его мокрота желтого цвета. Редко есть прожилки крови. Он эмигрировал в Соединенные Штаты 1 год назад и является иностранцем без гражданства. Его никогда не лечили от туберкулеза, никогда не делали кожную пробу (PPD) и не помнит делали ли БЦЖ вакцину. Он отрицает какие либо факторы риска ВИЧ. Он женат и не сообщает ни о каких контактах на стороне. Он ежедневно курит пачку сигарет и пьет пинту водки ежедневно. На осмотре, он выглядит хроническим больным с признаками истощения. Его индекс массы тела составляет 21 кг/м^2. Основные показатели жизнедеятельности следующие: BP 122/68 mmHg, HR 89 bpm, RR 22 дыхания/минуты, SaO2 95% , температура 37.9°C. При аускультации амфорические звуки дыхания сзади в верхнем легком с несколькими рассеянными крепитациями в этой области. Нет утолщения концевых фаланг пальцев. Осмотр других сисетм без патологии. Его рентгенограмма грудной клетки IV 149 иллюстрации. Окраска для кислотоустойчивых бацилл отрицательна. Какой самый приемлимый подход к лечению данного пациента?



a) Перевести пациента на воздушнокапельный карантин, пока три анализа мокроты не придут с признаками присутсвия кислотоустойчивых бацилл.

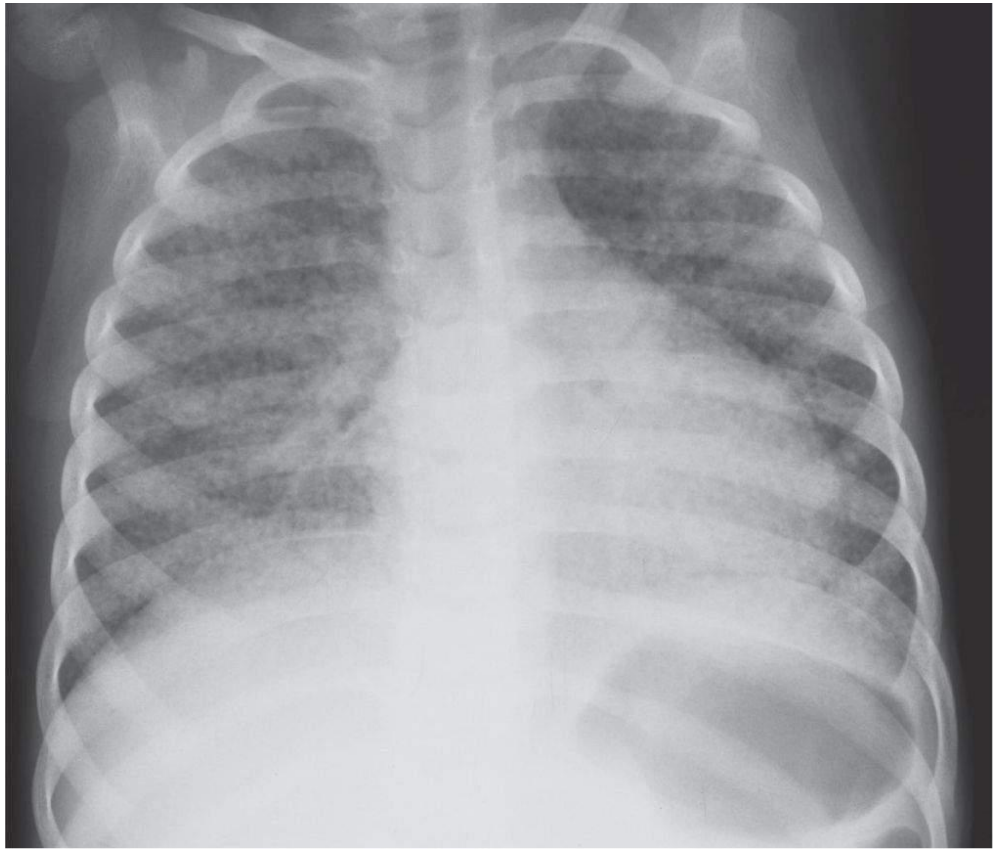
b) Перевести пациента в палату без изоляции, поскольку он вряд ли будет заразен с отрицательным кислотоустойчивым мазком.

c) Произвести биопсию поражения и проконсультироваться с онкологами.

d) Произвети туберкулиновую пробу в его предплечье и пригласить его для оценки через 3 дня.

e) Начать 6-недельный курс антибиотикотерапии по поводу анаэробного бактериального абсцесса.

18-летний молодой человек из Южной Африки пришел в клинику с жалобами из 2 недельного прогрессирующего недомогания с субфебрильными лихорадками. Он неспособен встать с кровати по утрам, чтобы пойти на работу. У него есть ВИЧ-инфекция и не получает лечение. Он отрицает кашель или мокроту. Его рентгенограмму грудной клетки на IV 150 иллюстрации. Учитывая его ВИЧ-инфекцию и высокое распространение туберкулеза в районе человека, Вы полагаете, что у него есть туберкулез. Какая из следующих форм туберкулеза является скорее всего, в этом случае?



a) Диссеминированный
b) Экстрапульмонарный
c) Лимфаденит
d) Плевральный
e) Вторичный кавитарный

50-летний человек госпитализирован в связи с активным легочным туберкулезом с положительным мазком мокроты на кислотоустойчивые бациллы. Он является ВИЧ-положительным больным с CD4 85/µL и не находится на антиретровирусной терапии. В дополнение к болезни легких у него находят поражени в теле позвонка L4. Какова самая адекватная начальная терапия?

a) Изониазид, рифампицин, этамбутол и pyrazinamide

b) Изониазид, рифампицин, этамбутол и pyrazinamide; начать антиретровирусная терапия

c) Изониазид, рифампицин, этамбутол, pyrazinamide, и стрептомицин

d) Изониазид, рифампицин и этамбутол

e) Отложить терапию, пока антибиотикограмма не будет доступна.

Все следующие люди, получающие реакции PPD туберкулина кожи, должны лечиться с связи подозрением на скрытый туберкулез КРОМЕ:

a) 23-летний наркоман, вводящий наркотики внутривенно, который является отрицательным ВИЧ и имеет 12-миллиметровую реакцию PPD

b) 38-летний учитель четвертого класса, у которого есть 7-миллиметровая реакция PPD и нет данных что у него есть активный туберкулез; он никогда не проверялся на PPD ранее

c) 43-летний человек в Корпусе мира, работающем в Африке к югу от Сахары, у кого есть 10-миллиметровая реакция PPD; 18 месяцев назад реакция PPD составляла 3 мм

d) 55-летний человек, который является ВИЧ-положительным и имеет отрицательный PPD; его партнеру недавно диагностировали кавитарный туберкулез

e) 72-летний человек, получающий химиотерапию для неходжкинской лимфомы и имеющий 16-миллиметровую реакцию PPD

Все следующие заявления относительно вакцинации БЦЖ верны КРОМЕ:

a) БЦЖ может привести к туберкулезу только у сильно иммуносупрессивных пациентах.

b) Вакцинация БЦЖ рекомендуется при рождении в странах с высокой распространенностью ТВ.

c) Вакцинация БЦЖ может вызвать ложноположительную кожную пробу туберкулина.

d) Вакцина БЦЖ обеспечивает защиту для младенцев и детей от туберкулезного менингита и миллиарного туберкулеза.

e) Вакцина БЦЖ обеспечивает защиту от туберкулеза у зараженных ВИЧ пациентах.