TB diagnosis

Microscopic examination of sputums for research on acid fast bacillus by Ziehl coloration or auramine
- this examination detects contagious patients who have pulmonary tuberculosis (TPM+).

- It is a screening process for patients who cough and spit and who have a sufficient quantity of bacilli in sputum to be detected: > 5000/ ml
- These patients are the most contaminating patients
TB diagnosis

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But TPM - are numerous

- « pauci-bacillar » cases: < 5000 bacilli per ml in sputum: - Nodular tuberculosis (non-excavated)
  - miliary
  - tubercular adenopathy
  - extra-pulmonary cases (EPT)

- Too weak patients who cannot produce an adequate sputum for bacterial analysis or are not cooperating (salivary sputum…)

- Treatment begun before screening

- Technical errors in the research of AFB.
What is the place for chest x-ray in the national TB program (1)?

**Rich countries:** respiratory symptoms
→ chest radiography (x-ray)

**developing countries:** The chest x ray is not recommended in first intention (recommandations of OMS and UICTMR)

- If TPM+:  **TB treatment without chest x-ray**
- If TPM-x 3 and persistance of symptoms after non-specific antibiotic, the national program recommends chest x-ray
What is the place of chest x-ray in the national TB program (2)

• The radiography cannot make, as microscopy can, a definite diagnosis of TB, because radiological aspects of TB are varied and often non-specific.

• But some images are very indicative of TB. Some other images must evoke differential diagnosis.

• The chest radiography is essential for TPM(-) TB. It is necessary for the physicians to be able to make a correct analysis.

  TPM - diagnosis is often made in excess, with a useless treatment and failure to diagnose another pathology.
3 distinct situations:

• The chest x-ray strongly suggests TB.
• The chest x-ray does not remotely suggest TB
• The chest x-ray might suggest TB, but differential diagnoses are certainly possible.

Whatever the situation is, it is always important to confront clinical signs, bacteriology and radiology.
Pulmonary TB, main radiological aspects and differential diagnoses

- Common TB in adults
- Miliary
- Serous membrane TB
- Node TB
- Pleural TB
- Sequela

Tuberculosis and AIDS: AIDS modifies the clinical and radiological course of TB. Differential diagnoses are many. It is important to know them, in order to chose the adapted treatment
Common adult TB
Basic radiological images:

- Nodule
- Infiltrate
- Cavity
- Tuberculous pneumonia
- These images can follow in time:
  nodule → macronodule → excavated nodule → caverna

- These elements are very often associated in the same patient

- The association of several images of different ages and different aspects is very indicative for TB

- Round picture with a diameter > 3 cm, non-excavated, is very rarely TB
Nodules and infiltrates
**Nodule**: isolated or grouped in the superior lobes or in the apical segment of the inferior lobes.

**Infiltrate**: group of various-sized nodules with unequal dimensions. The excavation is not always visible on the chest x-ray.

If the excavation exists, the bacterial analysis of the sputum is generally positive: TPM+.

(The TDM could show the excavation even if it is not visible on the chest x-ray)
Tuberculin skin test  5U  = 15mm
Good performance status,  FS = 0,
Physical signs = 0
Inflammatory S = 0
Expectoration: AFB -
Cultures -

Probable TB infiltrate
Man, 55 years old
Antecedent of pleural effusion
Fever, cough, weight loss
Hemoptoic sputum

Chest x-ray: left pleural sequela, retractile
Right nodular infiltrate. AFB+ in sputum
Excavated nodules >>> AFB+
Man, heavy smoker, cough, dyspnea and worsening condition

AFB + in sputum
Excavated nodule

Tubercular pneumonia
Excavation. AFB positive in sputums

Bronchoscopic view: tubercular endobronchic lesion
With tubercular granulomas
In the biopsy samplings
For the supra clavicles areas, always compare left and right.
For the supra clavicles area, the chest x-ray with antero posterior incidence is interesting.
For the supra clavicles area analysis, the chest x-ray with antero posterior incidence is interesting.
Bilateral nodules. AFB- in sputum. BK Cultures negative
nodule → macronodule → excavated nodule → caverna

In this patient, association of an infiltrate in the right superior lobe and cavern in the left inferior lobe.
Male, 20 years old, left exudative pleuresy
AFB- in sputum. Culture+ in pleural fluid and sputum. Infiltrate in right axillary area.
- TB nodules and infiltrates are most often isolated or grouped in the superior lobes or in the apical segment of the inferior lobes.

- They are difficult to see in the retro-clavicle area

- These lesions are often AFB- because non-excavated, no communication with bronchi and pauci-bacillar

- The association of lesions with different seniority (nodules, cavity, sequelas) or with extra pulmonary localisations is very indicative of TB.
• Nodules and infiltrates are often AFB- in sputum. So the risk of contamination is low (but not zero).

• AFB is negative in sputum, but sometimes cultures are positive.

• Even if the risk of contamination is low, it is important to detect these patients and treat them...
Male, 30 years old
Cough, fever, weight loss, asthenia

left retro-clavicle infiltrate
Excavation?

AFB-.
Amoxicillin treatment…
4 months later: left superior excavation with important infiltrate, AFB +++