

A Closer Look at Tuberculosis



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TB

- Caused by a bacterium called *Mycobacterium tuberculosis*.
- Mainly affects the lungs and throat. Symptoms include:
 - Bad cough, cough up blood (lasts 3 wks or longer)
 - Pain in the chest
 - Weight loss, chills, fever etc.
- NOT everyone infected will become sick.
 - Latent TB infection (LTBI): should be treated to prevent from developing the disease
 - Active TB disease: if not treated properly it can be fatal



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Standard Mantoux TB test

- TB or PPD (purified protein derivative) test determines if someone has developed an immune response to tuberculosis.
- Administered by an injection of a 0.1 mL of 5 TU (tuberculin units) PPD into the top layers of the forearm.
- Doctors will read the skin test 48-72 hours after injection.
 - Reaction: size of the raised, hard area or swelling
 - >8 millimeters is positive





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1-step vs 2-step

- One-step PPD is placed and read 48 hours later
- Two-step PPD is an initial test placed and read (in the 48 hour time frame) to establish a baseline.
 - If initial test is positive, no further testing is completed, will then require Chest X-Ray
 - If initial test is negative, second test is subsequently performed 1-3 weeks later and read 48 hours.





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Positive TB

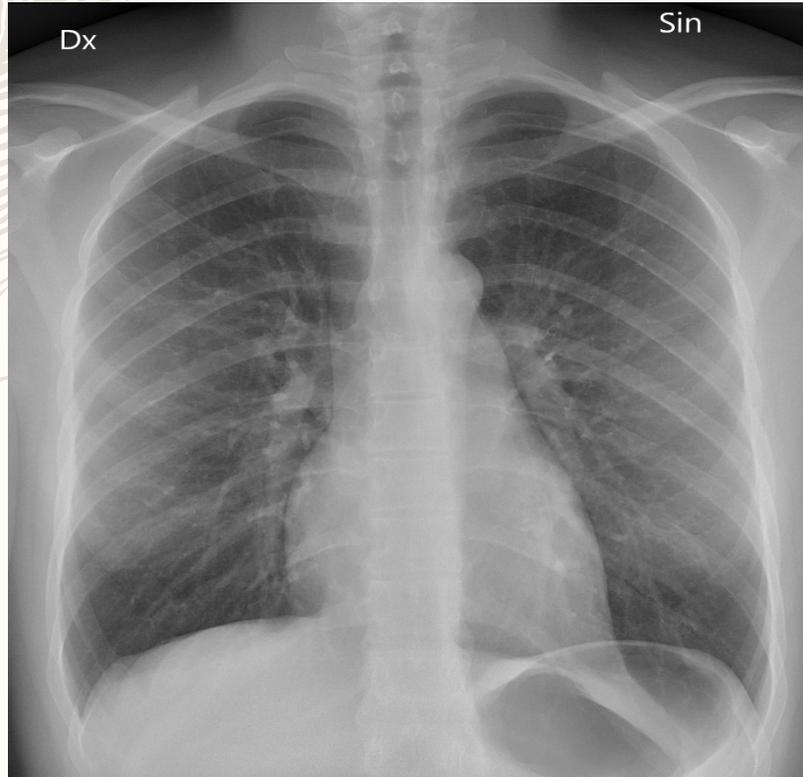
- Positive skin test result indicates patient was infected with TB bacteria.
- >8mm is considered a positive
- Medical assessment would be needed to indicate TBI (active or latent).
- Chest X-Ray to examine lungs, examples:
 - Infiltrates: pus or blood in the lungs
 - Lesions: a lump of mass of tissues or hardened blood



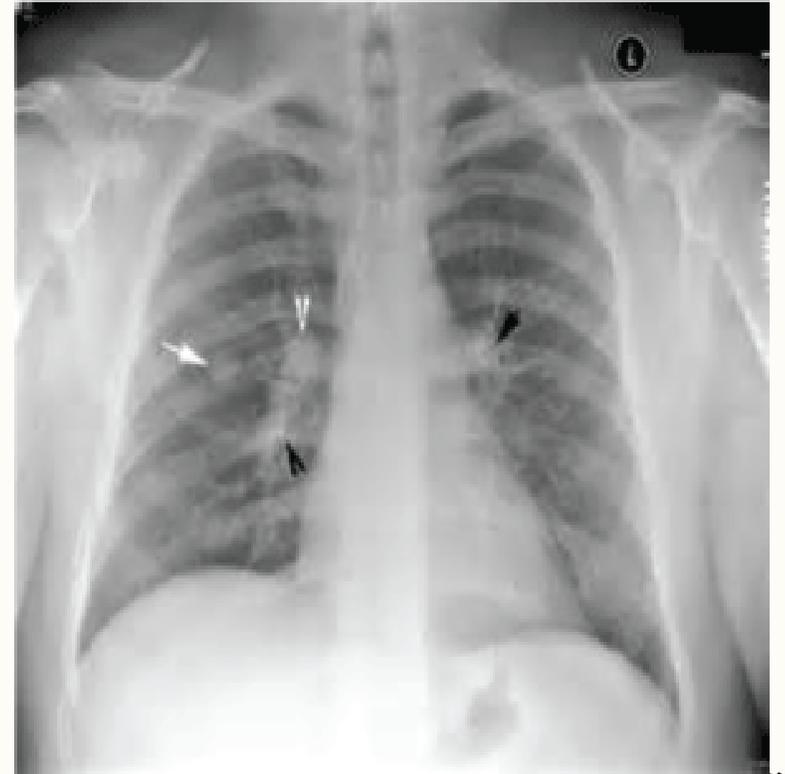
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Chest X-Ray

Normal



Signs of TB





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Drawing Blood: The future of TB Testing

- When White Blood Cells (WBC) are exposed to TB, they release Interferon Gamma (IFN- γ)
- IFN γ is used to activate the immune system
- Immune system battles bacteria
- Test uses WBC to test for reactivity to TB antigens
- Measure of IFN- γ will determine exposure to TB





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Two methods to measure: Concentration or # of IFN- γ cells

- IGRA Quantiferon: measures the quantity of IFN- γ in the blood sample
- T-Spot: measures how many cells (spots) are producing IFN- γ
 - Positive = ≥ 8 spots
 - Negative = ≤ 4 spots
 - Borderline = 5,6, or 7 spots





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Advantages / Disadvantages

- Requires a single patient visit to conduct the test.
- Results can be available within 24 hours.
- Does not boost responses measured by subsequent tests
- Blood samples must be processed within 8-30 hours
- Human error in transportation, administration, and interpretation
- Limited data on the use of IGRAs to predict who will progress to TB disease
- Test can be expensive



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JABSOM Aug 2020 Updates

- TB continues to be a case by case basis
- MS1 2024 = gradually completing all needed immunization requirements needed for matriculation
- MS2 2023 = completing yearly TB.
- MS3 2022 & MS4 2021 = completing yearly TB, Val has been updating HOOP.
- ‘Imi Ho’ola Program = Tdap & Varicella has been added to immunization requirements (effective July 1st, 2020)
- Congrats C/O 2020 = paper records are shredded!



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Works Cited:

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- Basic TB Facts. (2016, March 20). Retrieved July 24, 2020, from <https://www.cdc.gov/tb/topic/basics/default.htm>
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