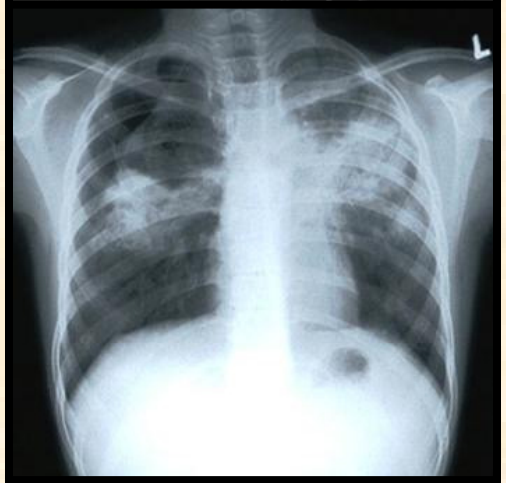
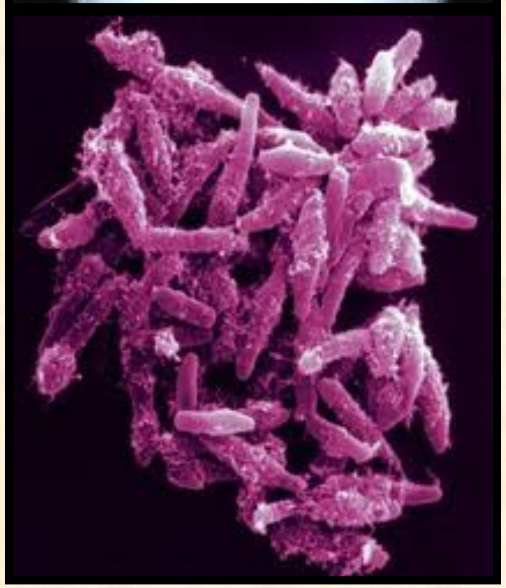
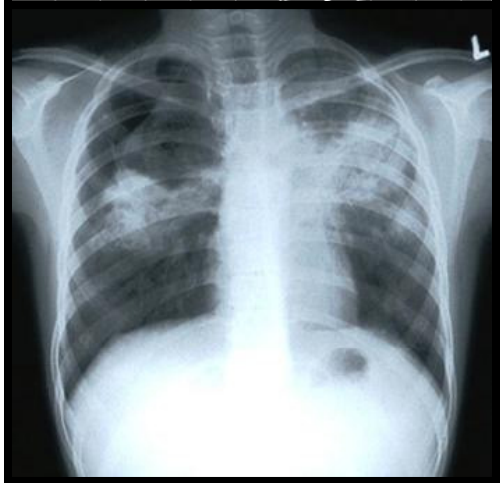
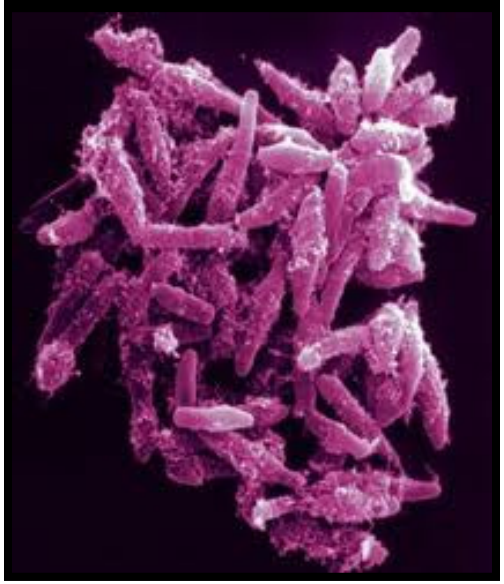


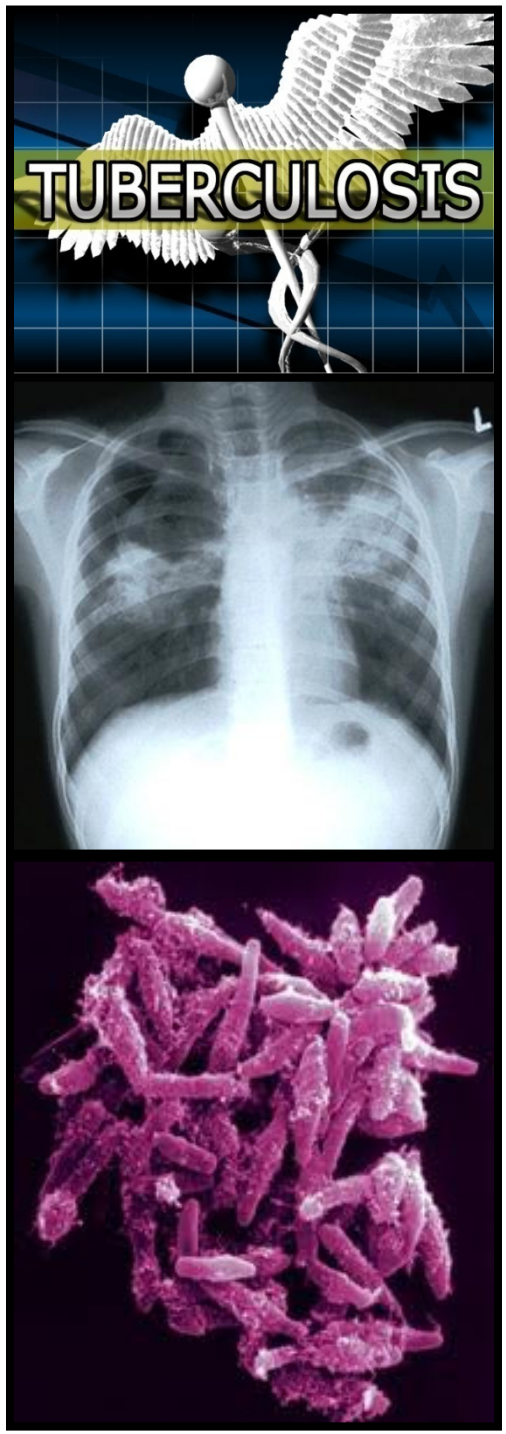


TUBERCULOSIS Case



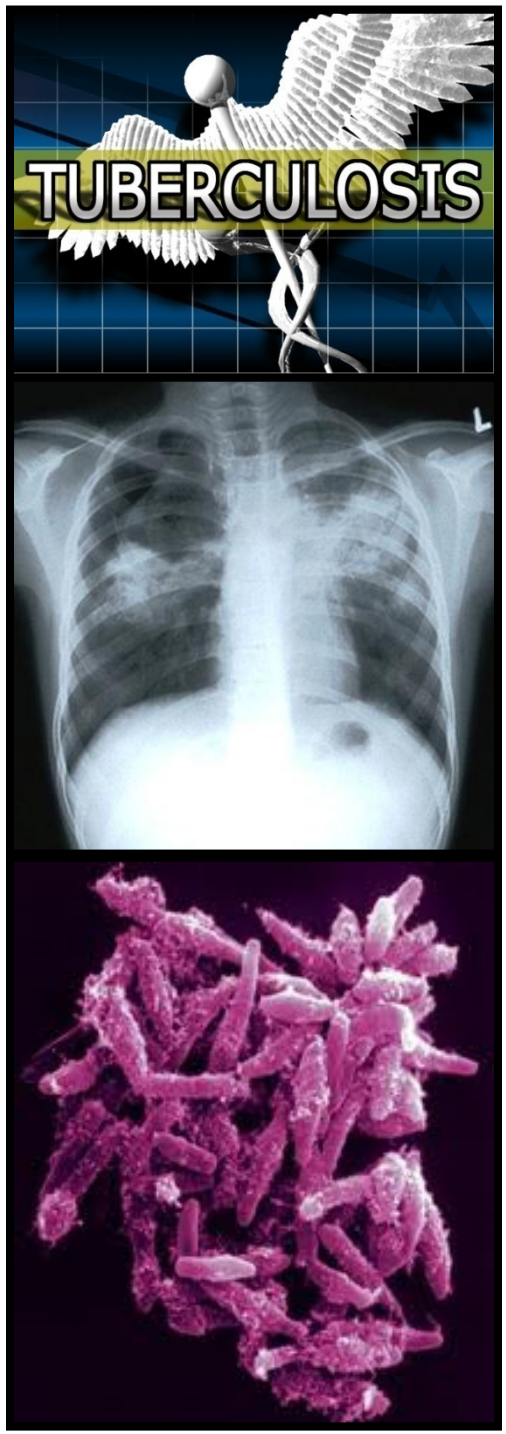


- **RB**
- 8 year old
- Male
- from Malate
- consult for the 1st time at PGH
- due to anorexia



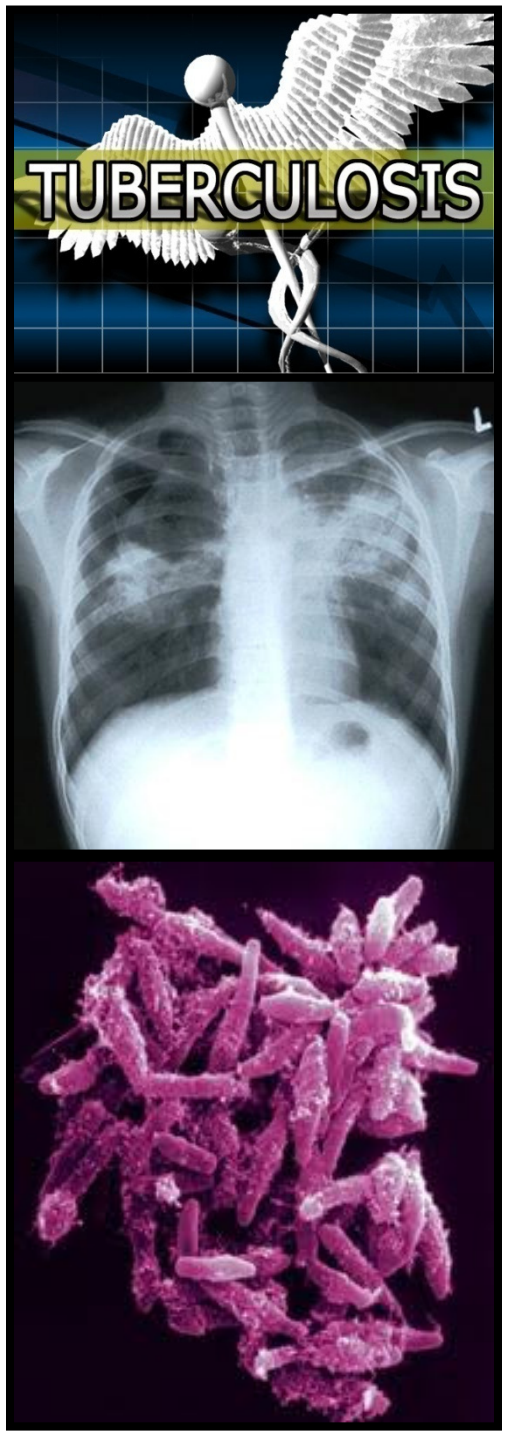
History of Present Illness:

- 2 years prior to consult→ (+) was diagnosed to have Primary Complex (based on chronic cough, + PPD and +CXR)
- He was treated with INH, Rifampicin, and PZA for 2 months and then allegedly with good compliance



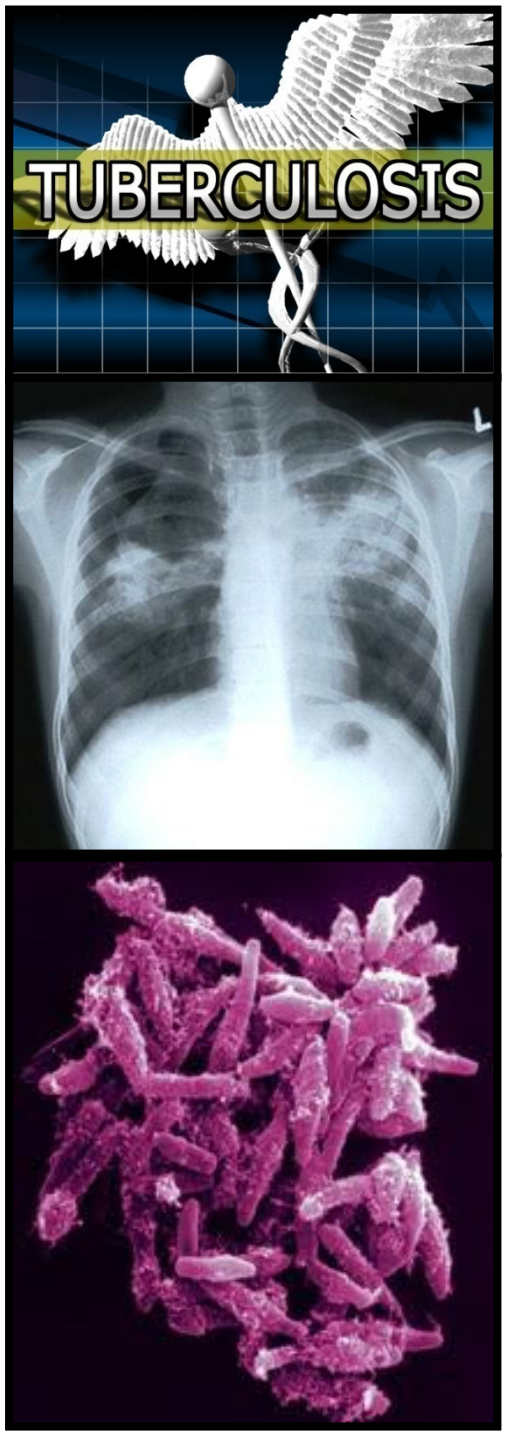
History of Present Illness:

- During contact investigation at that time, the grandfather who was staying with them was also diagnosed with active PTB and treated with quadruple anti-Koch's, however, this was only taken for 3 months.



History of Present Illness:

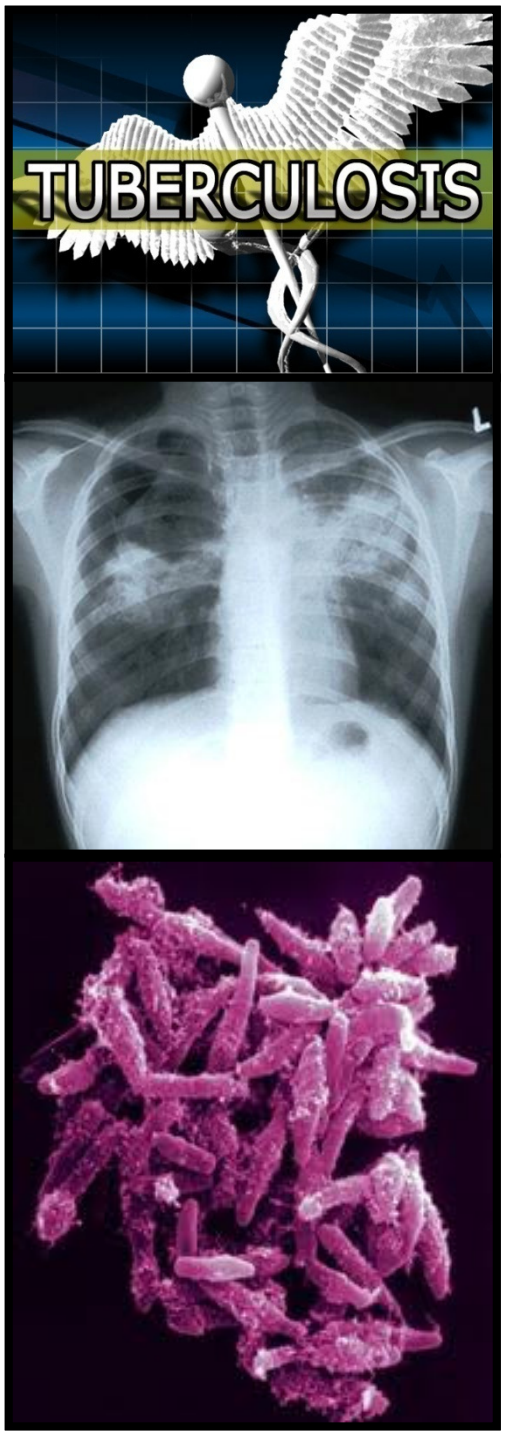
- The patient completed treatment and was apparently improved with weight gain and good appetite and sense of well-being and has been asymptomatic.



History of Present Illness:

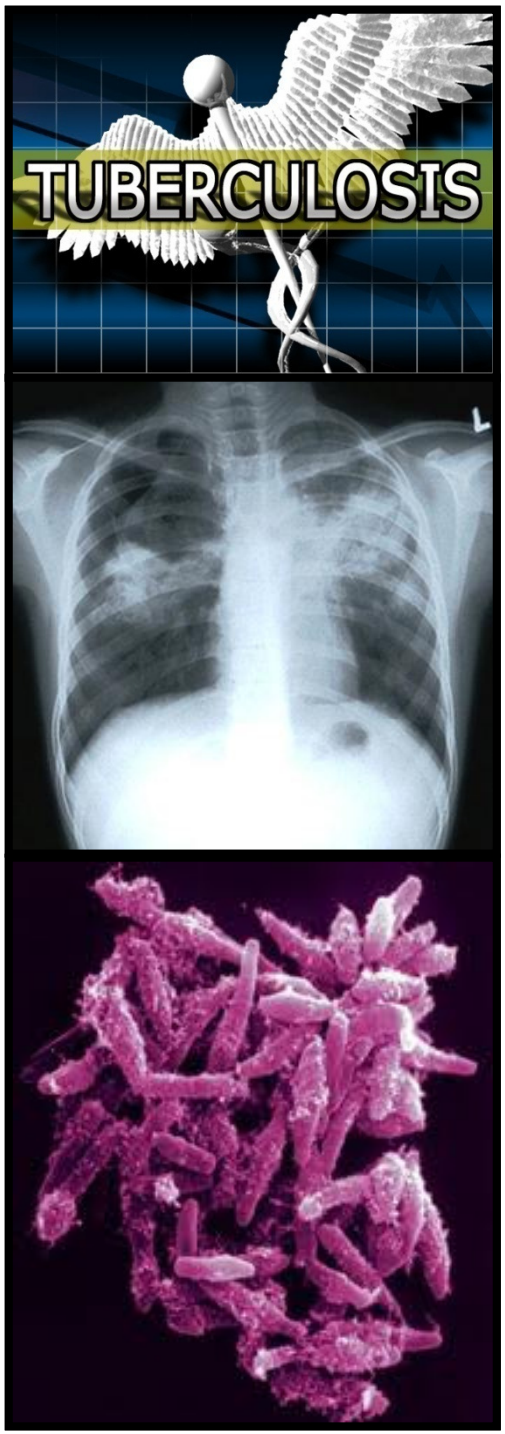
- 2 months prior to consult→ the patient was noted to be anorexic, with gradual weight loss. No other symptoms of cough or fever noted.

- On the day of consult→ repeat CXR showed progression of infiltrates. At this point, the grandfather, who still has chronic cough, is not living with them anymore, but visits occasionally.



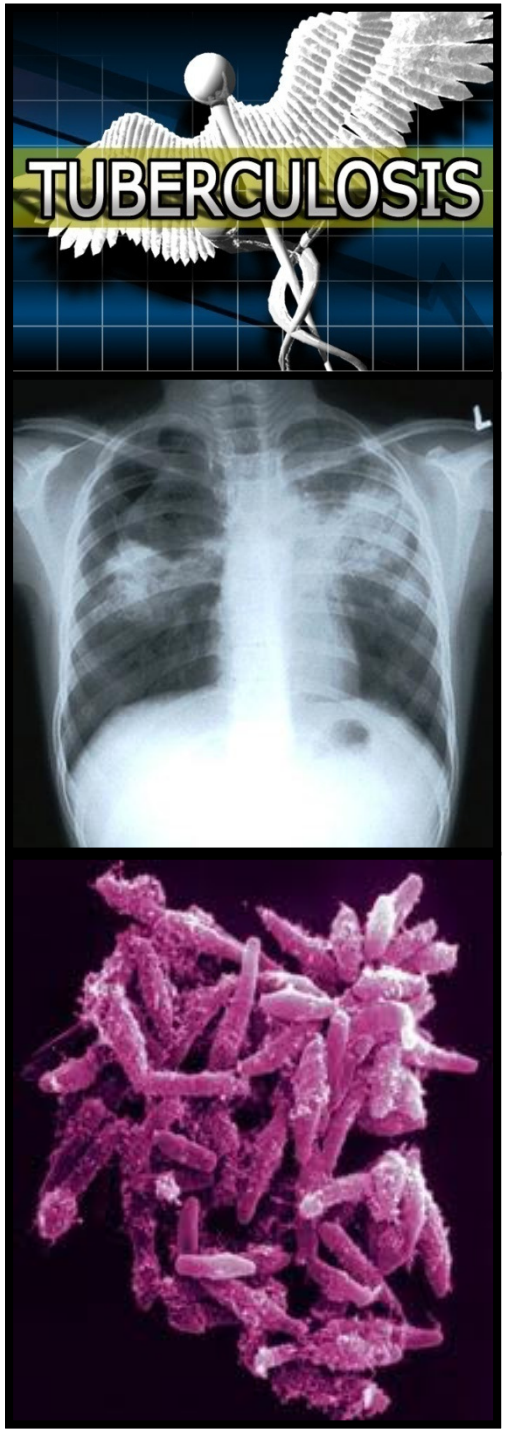
Review of Systems:

- (-) cough/colds
- (-)urinary/bowel changes
- (-)LBM
- (-) easy fatigability/ pallor/ easy bruisability
- (-)seizure



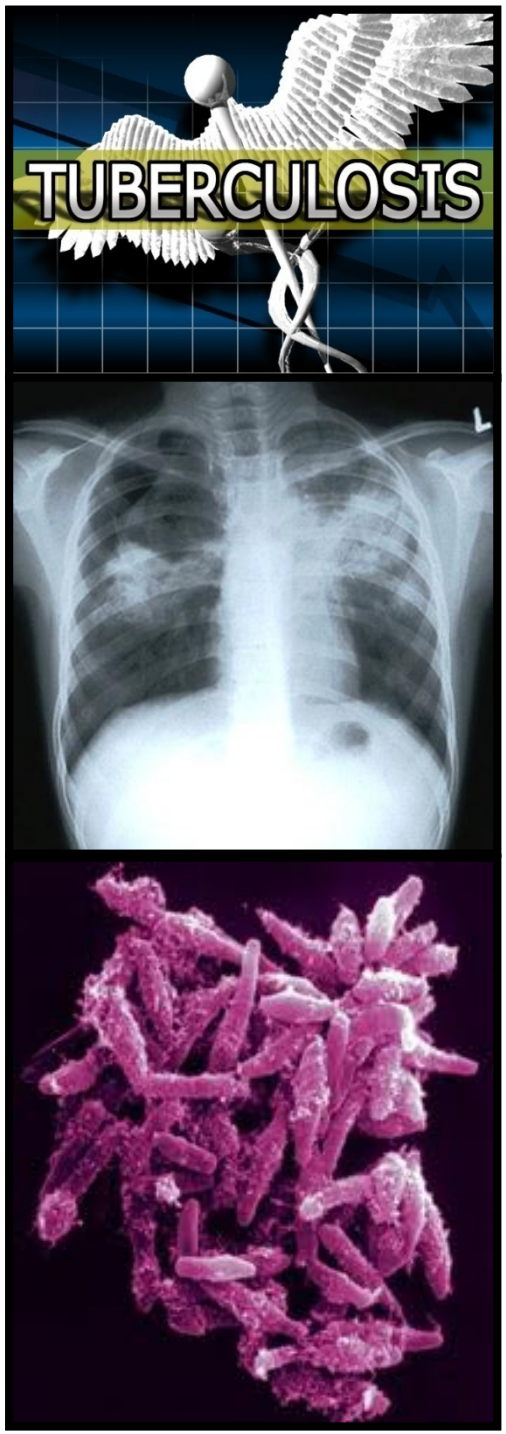
Past Medical History

- (-)previous hospitalization
- (-)food & drug allergy



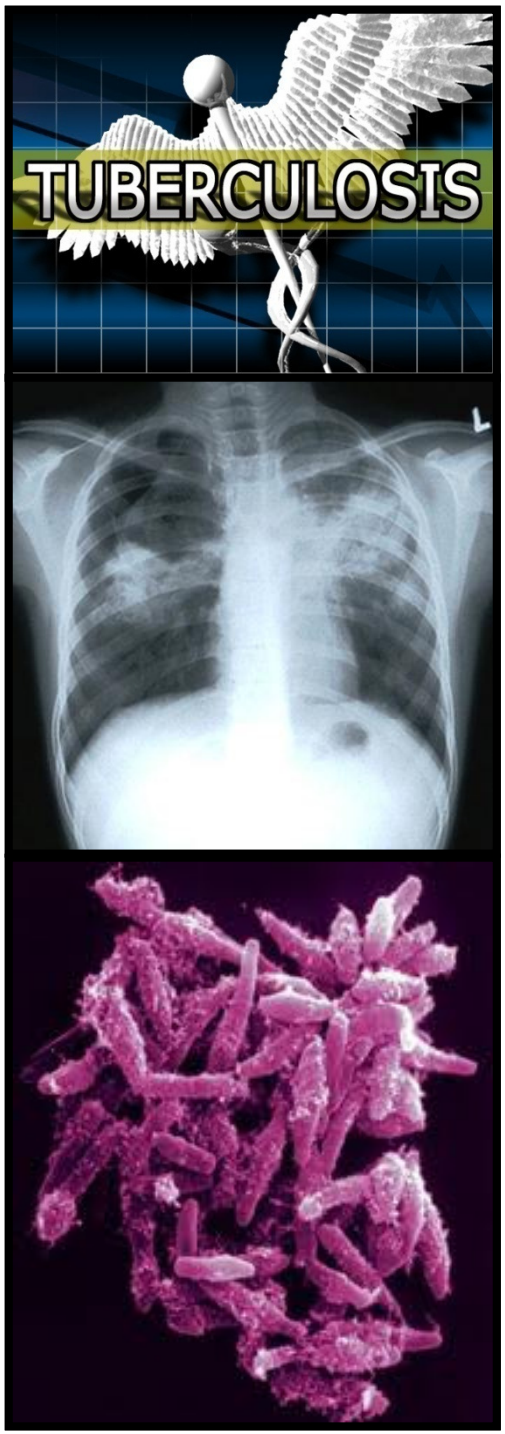
Family History

- (+)PTB and HPN – grandfather
- (+)BA – father
- (-)DM, CA, PTB



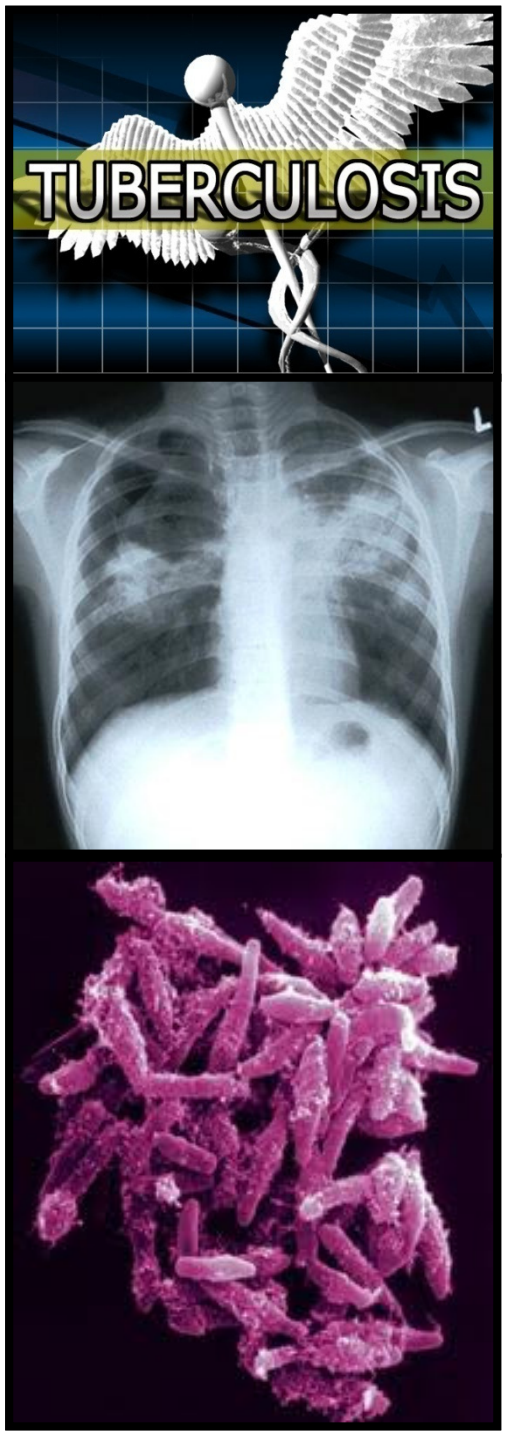
Birth/Maternal History

- Born FT via SVD to a 24 year old G1P0 mother at Chinese General Hospital
- (+)Prenatal check-up with private MD
- (+)fever x 1 episode at 7 mos AOG→Paracetamol
- (-)Fetomaternal complications noted



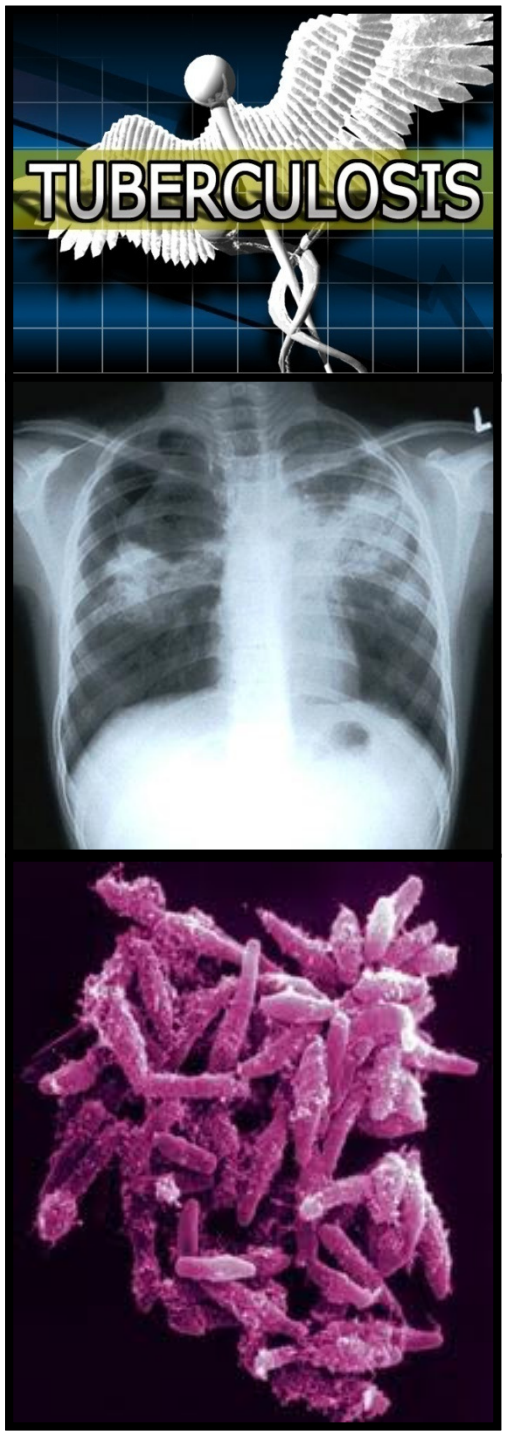
Immunization History

- Completed EPI



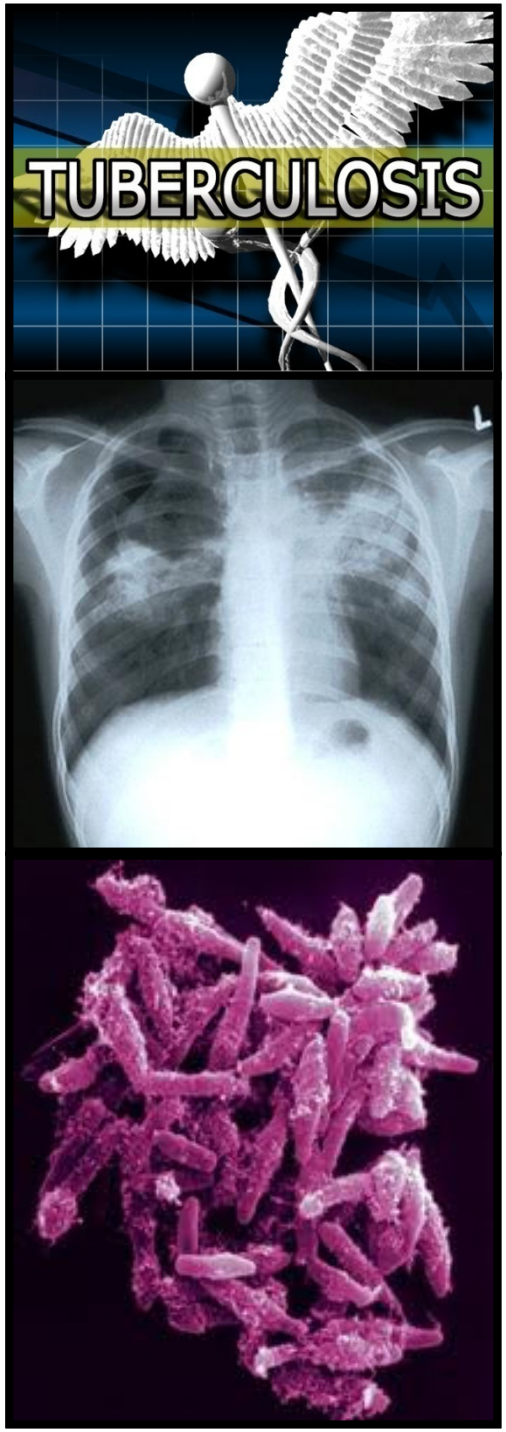
Nutritional History

- Purely breastfed x 2 mos→ milk formula
- Presently, no food preference, no food allergy, was not a picky eater



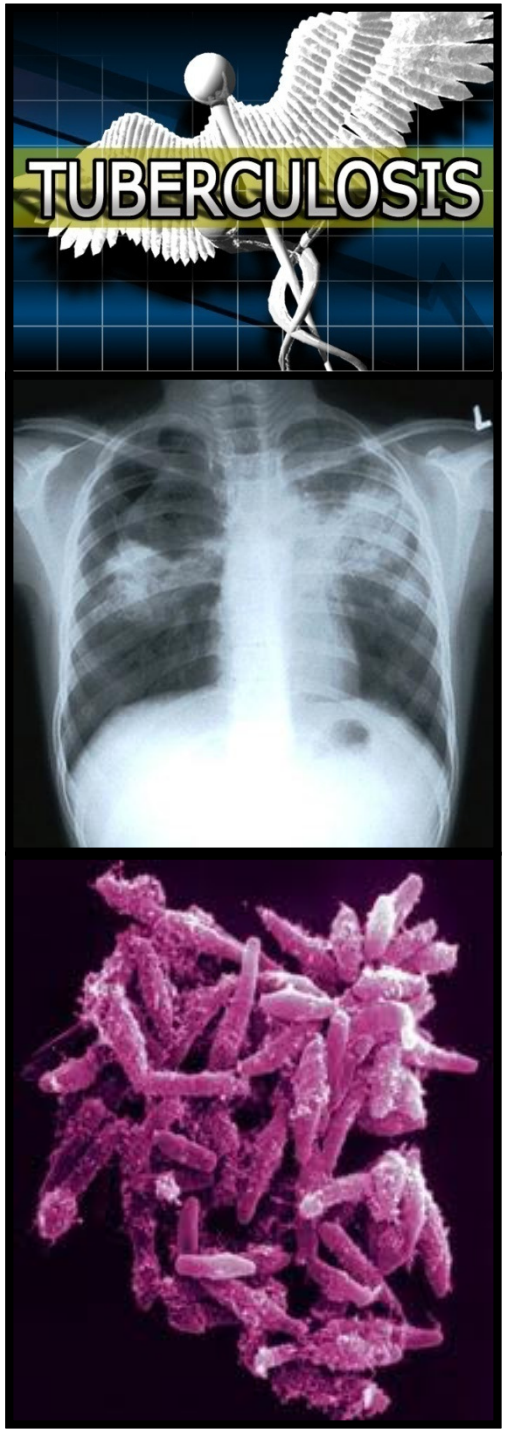
Developmental History

- At par with age



Personal/Social History

- Father is 36 year old factory worker
- Mother is 32 year old food server/waitress



Physical Examination

- Awake, active, afebrile, not in cardiopulmonary distress
- Wt: 21 kgs Ht: (+) stunting
- CR: 94/min RR: 24/min T: 37.1^{o}C
- Pinkish conjunctivae, anicteric sclerae, (-)TPC, (+)CLAD
- Equal chest expansion, clear breath sounds, no rales/wheeze
- Adynamic precordium, normal rate, regular rhythm, no murmur
- Full abdomen, NABS, soft, no palpable organomegaly
- Full and equal pulses, (-) edema, (-)rashes
- Neurologic exam essentially normal

CURATIVE CHEMOTHERAPY FOR ACTIVE TB DISEASE

Clinical Form	Rationale	Current treatment guidelines (months intensive phrase/continuation phase)
Sputum smear-negative (pulmonary and less severe extrapulmonary	• Low organism load • Drug penetration good	2 HRZ/ 4 HR• 2 HRZE (S)/4 HR if H resistance suspected, proven or unknown+
Sputum smear-positive (extensive pulmonary infiltrates/cavities)	• High organism load • Drug penetration good	2 HRZE (S)/ 4 HR 8-9 months duration of therapy if: • Immunocompromised • Extensive disease • Delayed treatment response
Disseminated (miliary) TB TB meningitis Bone and joint TB	• High organism load • CNS penetration good	For miliary TB 2 HRZE/ 4 RH For TB meningitis 2 HRZE/ 10 HR* 2 HRZS (Eth)/ 7-10 HR*** 2 HRZS/ 4 HRZ 2 HRZS/ 4 HR
Previously treated smear-positive pulmonary TB • Relapse • Treatment failure • Treatment after interruption	• High organism load • Drug penetration good	2 HRZES → 1 HRZE / 5 HRE ++++
MDR-TB, XDR-TB	• High organism load resistant to the 1st line drugs • Use of second-line/3rd line anti-TB frugs	Specially designed standardized or individualized regimens under TB specialist supervision

Key Messages on Childhood TB

DR. ROSALINDA SORIANO

- Cough is more apt to be associated with non-TB pulmonary lesions than with TB
- There may be no complaints by the child or no notice of unusual manifestations by family
- Increased RR is as important in arriving at a diagnosis of TB as evening rises of temperature

- Phlyctenular conjunctivitis is NOT uncommon, if present, suggests active disease
- Erythema nodosum if present STRONGLY suggests active disease
- There may be fine rales which are more consistently detected at the beginning of an inspiration which follows a slight cough after forced expiration

- Hilar lymphadenopathy, with associated parenchymal disease is the most common radiographic finding
- Size of tuberculin reaction is of little or NO PROGNOSTIC significance
- Calcification may imply healing of the lesion. Lesions in other sites may remain indolent or resist healing EVEN with treatment

- Investigations have reported limited transmission in an outpatient setting
- The most efficient place to stop airborne transmission is at THE SOURCE, the INFECTED PERSON
- TB patients should be taught to cough into close-fitting containers or into cupped hands

- LONG EXPOSURES and clinical characteristics of source patients are the CRITICAL FACTORS for TB transmission

Presumptive Diagnosis: Review criteria

1. Can a diagnosis be made on the basis of history and PE? Only 2 criteria satisfied (exposure, s/s) but with +TST and suggestive CXR, presumptive Dx can be made 2 yrs PTC

2. Any further diagnostic tests to make? If child can expectorate, do a sputum smear

3. Preventive aspects: In retrospect, child should have been investigated when grandfather was first diagnosed with PTB (intensified case finding), and given IPT

New diagnostics in childhood TB: dream or reality (Anneke Hesseling, 2010)

- What are we trying to detect? Exposure? Infection? Contained disease? Severe disease? Disseminated disease?

- [MDR-TB?]

Diagnostic Tests for TB

1. Mycobacteriology
2. Histology
3. Serology
4. Molecular: Nucleic acid amplification tests and probes
5. T-cell based assays (interferon gamma release assays or IGRA)

Local availability? Where? Cost?

Interferon Gamma Release Assays (IGRA) : Claimed advantage over TST

1 Only a single blood test is done
2 Second visit not often required (vs TST rdg)
3 Objective test result (less reader bias)
4 No booster phenomenon
5 More independent of BCG effect [if it matters]

- BUT like TST, IGRA cannot distinguish between TB infection and disease
- IGRA not ready to replace TST by a long shot

NAATs

- Utilize techniques to amplify nucleic acid regions specific to the M tb complex
- Can identify a single bacillus in a specimen (also its weak point)
- Most useful for serious disease where identification is urgent
- Commercially available in the Philippines: Amplicor MTB and Cobas Amplicor
- LAMP (Loop-mediated isothermal amplification)

Rapid molecular detection of TB and rifampin resistance
(Boehme et al, NEJM, 2010)

- Xpert MTB/Rif
- automated molecular test for MTB and resistance to Rif
- sensitive detection directly from untreated sputum in <2 hrs with minimal hands-on time
- Other applications:smear negative, culture positive sputum;
- [potential for paucibacillary disease in children open field for research]
- [Can become important tool at point of contact, even at the community level]

Maximize available tests

- More training for recognition: 2 entry points
  1. symptomatic child
  2. contact tracing (qualify if close, constant)
- Define “TB Symptomatic” - 3 out of 6 s/s (other indicators and cues like school attendance, sick consults, medication history, etc)
- Presumptive diagnosis: apply 3 out of 5 criteria
- More training for TST and availability of PPD
- Induced sputum vs gastric lavage

4 I's to stop TB

- Intensive case finding or contact investigation
- Isoniazid preventive treatment
- Infection control of TB

  (copied from 3 I's for HIV-TB program]
- Information dissemination (to grassroots)

LET US ALL STOP TB!

Treatment


Tuberculosis Bacteria
TB
ALERT
Stop Tuberculosis Worldwide

Aims of Chemotherapy

1. To provide most effective treatment
   to rapidly reduce bacterial load thereby
   - Improve clinical manifestation
   - Limit disease progression
   - Prevent death or late complications
   - Prevent transmission

   • H>R / Fluoroquinolones – bactericidal efficacy

Aims of Chemotherapy

2. To ensure eradication of slow or intermittently metabolizing / multiplying TB bacilli (persistent) to prevent relapse and / or reactivation

- R>H in caseous lesions
- Z>R>H within macrophages

} sterilizing / efficacy

Aims of Chemotherapy

3. To prevent emergence of resistance

4. To achieve all these with minimum adverse effects

Basic Principles of Chemotherapy

1. Use of multiple drugs to which organisms are susceptible

2. Therapy continued for a sufficient period of time to fully eradicate TB bacilli to achieve last cure

3. Goal – to provide the most effective therapy at the shortest period of time to prevent emergence of resistance

Case

- RB
- 8 years old
- Diagnosis: Reinfection PTB
- Curative chemotherapy: 2 HRZE/4 HR
- Contact investigation of all members of the household and treat accordingly

Question

- IF PATIENT DEVELOPS JAUNDICE
  1. Baseline liver profile with close clinical and biochemical monitoring and supervision

  2. An elevation of liver enzyme <5x N value is not unusual but in the presence of liver tenderness or jaundice:

Question

- IF PATIENT DEVELOPS JAUNDICE

  2.1 R/O other causes of hepatitis

  e.g. Hepatitis A, B, C, EBV, CMV

  2.2 Hepatic toxicity may occur with H, R, Z and / or Eth at any time during treatment period but usually within 2-4 wks of therapy

- Withdraw all potentially hepatotoxic, use non-hepatotoxic drugs in the interim

  e.g. E, S

- Usually jaundice & other symptoms subside in 1-2 weeks

- WHO – reintroduce 2 weeks after jaundice subsides

  -introduce potentially hepatotoxic one at a time when liver function test (transaminase) has normalizes (<2x N value).

  e.g. R – 5 to 10 mkday under hospital supervision; repeat SGPT after 3 to 5 days; if <3x N value monitor for 1 week <u>then</u>

- Reintroduce H – 5 to 10 mkday; repeat 3 to 5 days; if <3x N value
- If R & H have been reintroduced successfully, Z, the most hepatotoxic is not reintroduced.
- If Z has not been completed (2 mos), retain E with H & R for a total of 8 to 9 months

- If rechallenge is unsuccessful, which rarely happens, liver friendly drugs (e.g. S, F, ofloxacin) for 9 to 12 months
- If no jaundice, only malaise & nausea, R may be continued
- Clinical monitoring with at least monthly questioning on hepatotoxicity related symptomatology is advised.

PREVENTIVE CHEMOTHERAPY FOR TUBERCULOSIS

Clinical Form	Rationale	Current treatment guidelines (months)
TB Exposure	• Low organism load • Drug penetration good	3H+ then repeat TST if: -TST (+), CXR (-), asymptomatic, continue 6H more – see LTBI (evaluate, rule out TB disease) -TST (-), asymptomatic source case treated and/or removed, discontinue H, give BCG after 2 weeks (for <5 yrs. old) 6H++
Latent TB infection (LTBI)	• Low organism load • Drug penetration good	9 H 6 R if with primary H resistance 3 HR +++
TST (+) with stable/healed lesion, with previous treatment at risk of reactivation due to **• Measles, pertussis, etc** **• Immunosuppression from drugs, IDDM, leukemia, chronic dialysis**	• Low Organism load • Drug penetration good	1-2 H H for the duration of immunosuppression