Inpatient Standards of Care & Discharge Planning

S/He’s in the Hospital:
Now What Do I Do?
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TB Intensive Workshop, Lansing, MI 2012

Objectives: My audience will
• Think of TB more often
• Recognize TB better
  – Risk Factors
  – Chest x-ray appearance
• Know what to do when TB is suspected
  – Infection control
  – Testing / interpreting
  – Treating
  – Contacting health dept
  – Determining non-infectiousness
  – Planning Discharge

Fundamentals of TB Infection Control
One of the most critical risks for health-care-associated transmission of *M. tuberculosis* in health-care settings is from patients with unrecognized TB disease who are not promptly handled with appropriate airborne precautions (56, 57, 93, 104) or who are moved from an AIH room too soon (e.g., patients with unrecognized TB and MDR TB) (94).

Those oral antibiotics are just not working!

WHEN TO THINK TB
Cough for 3 Weeks.
Risk Factors.

The patient has a good chance to have been infected by TB
(Being in the right place at the right time)

The patient has a risk factor for getting sick after being infected with TB

Symptoms / X-ray
Who is at risk for exposure to or infection with TB?

- Close contacts of person known or suspected to have active TB
- Foreign-born persons from areas where TB is common
- Persons who visit TB-prevalent countries
- Residents & employees of high-risk congregate settings
- Health care workers (HCWs) who serve high-risk clients

Who is at risk for TB after exposure or infection?

- Immune suppression
  - HIV
  - Organ transplants
  - Prednisone >15 mg/day > 1 month
  - TNF-α antagonists (infliximab, etanercept, adalimumab)
- Stable chest x-ray consistent with old healed TB
- Children <4 years old
- Silicosis, Diabetes, ESRD, underweight, low dose corticosteroids, cancer head & neck

TB skin test 5 mm is +

TB In Detroit 2011*

- Cases 53
- Children <22months old
- Incidence 7.4 per 100,000 population
- Alcohol abuse 30.2%
- Injection drug use 15.1%
- Non-injection drug 35.8%
- HIV + 3.7%
- Homeless 28.3%
- Black 77.4%
- US Born 83.0%

Children, adolescents exposed to high risk adults.

* DDHWP jurisdiction

Initial Infection: Primary TB When Diagnosed

Frank Netter

Early TB: Smudge Sign

22 year old found on contact investigation, cough for 4 days, + sputum culture for TB
**Early TB: Miliary / Lymph Nodes**

- 16 year old girl with disseminated MDR TB
- 15 year old boy with cough, living with high risk adults, aunt with MDR TB

**Early TB: Pleural Effusion / Infiltrate**

- 20 year old, 2 months post-partum, household contact
- 14 month old, household contact

**Late TB**

- Cavitary
- Extrapulmonary

**TB Classification System**

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<thead>
<tr>
<th>Class</th>
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<td>0</td>
<td>No exposure, no infection</td>
</tr>
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<td>1</td>
<td>Exposure, no evidence of infection</td>
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<td>2</td>
<td>TB infection, no disease</td>
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<td>3</td>
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<td>4</td>
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<tr>
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**Initial Management of TB Suspect**

- Place patient in airborne infection isolation (AII)
  - Ventilation – over 20 air changes per hour
  - Negative pressure
  - Masks
    - HEPA for contacts
    - Regular ones for patient
Initial Testing for TB

- Collect 3 sputum samples (mycobacteria, AFB) at least 8 hours apart
  - include at least 1 first morning sample
- TST or IGRA (BAMT)
- HIV test

Sputum Processing (1)
AFB Smear

- AFB smear – should be available in 24 hours
  - Neither rules in nor rules out TB
  - 45-80% sensitivity in culture + TB
  - 50-80% + predictive value due to non-tuberculous mycobacteria
  - NEVER EVER say “We ruled out TB with negative AFB smears.”

Sputum Processing (2)
Nucleic Acid Amplification Test (NAAT*)

- Perform on at least 1 respiratory specimen from patients suspected of having TB when the result would influence TB control activities or case management (MMWR January 16, 2009 / 58(01);7-10)
- Done directly on processed sputum
- Results available within 48 hours
  - Tests for MTB Complex
    - MTB, M Bovis, M Africanum
  - Detects >95% TB in smear + specimens
  - Detects 50-80% TB in smear - specimens

Sputum Processing (3)
Culture & Drug Susceptibility

- Growth detection (culture): \(< 14 \text{ days (broth)}\)
  - Cultures may take as long as 8 weeks
- TB identification: \(< 21 \text{ days (DNA, broth)}\)
- Susceptibility testing (DST): \(< 30 \text{ days (directly on broth)}\) – 1\textsuperscript{st} drugs
- DST of 2\textsuperscript{nd} drugs: \(< 4 \text{ weeks from request or identification of resistance to primary drug}\)


After 48 hours Decisions to be Made
But - Information Pending

- Diagnosis – may remain uncertain
- Infectiousness – may remain uncertain
- Drug susceptibility – may remain uncertain
What Not To Do

- 58 year old man with shortness of breath
  - Admitted 5/18-19/2012
  - Former heroin addict, in methadone program
  - Homeless, living in shelters
  - Frequent courses of systemic steroids for asthma

Hospital Course

- Placed in AAI.
- 3 sputums for AFB collected 5/18-19
- Discharge summary 5/19
  - “Continued with treatment of community-acquired pneumonia with ceftriaxone and doxycycline while inpatient. Strep pneumo antigen was negative. CXR showed right upper lobe infiltrate and there was a concern for TB. Excluded tuberculosis with serial AFB stain and culture which came back negative x3 (8 hrs apart). Continued AFB isolation until TB was ruled out. Patient is discharged home on 5 days of Moxifloxacin.”

Follow-Up: Lab Report in CIS

Mycobacteria Culture - M - UNKNOWN, PERSONNEL
SPECIMEN DESCRIPTION: SPUTUM - Collected 5/18
SPECIAL REQUESTS: NONE
MYCOBACTERIA SMEAR: FLUORESCENT STAIN NEGATIVE FOR ACID FAST BACILLI
RESULTS: RARE MYCOBACTERIUM TUBERCULOSIS COMPLEX CALLED TO Dr X and TC Inf Control 06/13/12 at 1410 by JS SUSCEPTIBILITY TEST PERFORMED AT: MICHIGAN DEPARTMENT OF COMMUNITY HEALTH, MARTIN LUTHER KING, JR. BLVD., P.O. BOX 30035, LANSING, MICHIGAN REPORT STATUS: FINAL 07/14/2012

Initiating Treatment: When & How to Treat

- Promptly treat all confirmed cases
- Promptly treat all suspects considered highly likely to have TB
- In hospital or out, DOT (directly observed therapy is standard)
- Notify local health department

TREATMENT OF ACTIVE TB
Therapy for TB

- Initial therapy: RIPE by DOT
  - Standardized dosing

55 – 75 kg person

Add or subtract 1 PZA & 1 EMB if weight is greater or less

Each pill: INH 300 mg, Rifampin 300 mg, PZA 500 mg, EMB 400 mg

Laboratory Criteria for Diagnosis

- Isolation of MTB Complex from a clinical specimen — takes more time
  — OR

- Demonstration of MTB Complex from a clinical specimen by NAAT — may not be sensitive enough in smear negative cases. Not usually done as a reflex in smear negative cases
  — OR

- Demonstration of acid-fast bacilli in a clinical specimen when a culture has not been or cannot be obtained or is falsely negative or contaminated

Clinical Case Definition

All criteria must be met
Diagnostic evaluation must be completed

- A + TB skin test or IGRA
  — AND

- Signs, symptoms, x-ray / CT, other evidence of current disease
  — AND

- Treatment with 2 or more anti-TB medications

TB Suspect In Hospital: Discontinuing All

- Infectious TB is considered unlikely
  
  And
  
  — 1. Another diagnosis is made that explains the clinical syndrome

  Or
  
  — 2. 3 consecutive sputum smears are negative (including 1 collected 1st thing in the morning)

- This can be accomplished in 2 days

- TB is not “ruled out at this point,” but is unlikely

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TB Suspects Likely to Have TB & Confirmed Cases in Hospital: Discontinuing All

- All of the following conditions are met:
  - Adequate treatment for 2 weeks or longer
  - Improved symptoms
  - 3 consecutive negative sputum smears from sputum collected in 8-24 hour intervals (at least one early morning specimen)

**NOTE:** 3 sputums negative for AFB does not rule out TB and does not rule out the possibility that the patient is infectious.

MDR TB or Suspected MDR TB Discontinuing All

- Continue All for entire hospitalization until cultures are negative, regardless of AFB smear results

Conditions for Discharge: TB Cases Homeless or Living in Congregate Settings

- Continue All in hospital until all the following conditions are met
  - Adequate treatment for 2 weeks or longer
  - Improved symptoms
  - 3 consecutive negative sputum smears from sputum collected in 8-24 hour intervals (at least one early morning specimen)
- 3 consecutive cultures are negative regardless of smear results

Conditions for Discharge: Infectious Patients

- The patient has a home to return to
- Children < 4 years old & anyone with HIV or other immune compromise are either not in home or have been evaluated & started on “window prophylaxis” (preventive therapy) or treatment for disease
- The patient is willing to be on “home isolation”

Conditions for Discharge: All Confirmed Cases & Suspects

- The Health Department has been notified
  - Visits the patient in hospital
  - Confirms address
  - Assesses home
  - Arranges DOT
  - Performs contact investigation
  - Provides expert consultation
  - Might know where the patient may fit within a cluster
  - Assures case supervision & completion of therapy
Treatment at Time of Discharge

- The health department may NOT want you to give the patient prescriptions for TB medications
- Having access to medications may cause patients to resist DOT

Latent TB Infection

- LTBI is the presence of *M. tuberculosis* organisms (tubercle bacilli) **without symptoms, + cultures, or radiographic evidence of TB disease.**
- Diagnosed by "positive" TST or IFN γ release assays
- **Note:** One **CANNOT** diagnose LTBI when symptoms & x-rays suggest TB!

Homeless Man

STOP
CHECK WITH NURSE BEFORE ENTERING

WEAR RESPIRATOR TO PROTECT YOUR LUNGS