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Global Tuberculosis Institute
NEW JERSEY MEDICAL SCHOOL

# TB Case Studies

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## Background

- 59 year old male moved from Philippines in 1970
- Former smoker with diabetes, hypertension and COPD
- Went to the ED with respiratory distress and SOB
- Admitted to the hospital on June 23, 2016 with a spontaneous tension pneumothorax
- PPD 0mm, QFT positive x2
- History of a cough of undetermined duration
- CT on admission was read as abnormal/cavitary disease
- Sputum collected on June 28 reported as AFB smear positive (3+)



## Background (2)

- 7/1/16 positive PCR MTB
- MTB with no resistance (pansensitive)
- Diagnosed with pulmonary TB
- Rifampin, INH, and Ethambutol started on July 1st
- Pyrazinamide started on July 6th
- He had not converted to negative culture two months
- Drug levels done and were normal



## Past History (Missed Diagnosis?)

- February 2015 patient had a chest x-ray that showed right lung areas of opacification
- Treated with for pneumonia with Levaquin ®
- Prior to his June admission he was seen for a cough and treated with Bactrim for two weeks



## Contact Investigation

- 5 family members were tested and all were QFT positive and chest x-ray negative
- 6 social contacts tested and 4 were PPD positive
- He was not placed in airborne isolation until June 28th
  - Five days after his admission



## Hospital Exposure

- July 11 2016 a management meeting and an on site assessment was done for potential exposure
- Computerized records revealed:
  - Spent 4 minutes in the waiting area in emergency department (ED)
  - Spent 5 minutes in triage room
  - Spent 5 minutes in the exam room
- No high risk contacts were identified in the ED
- Prior to being placed in isolation 5 health care workers were identified based on time spent with the patient
- All were QFT negative on initial and post exposure

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## Clinical Findings That May Warrant a Site Assessment

- Persons with suspected or confirmed potentially infectious TB in a congregate setting at any time during their infectious period with one or more of the following characteristics:
  - Laryngeal TB
  - Sputum smear positive pulmonary TB
  - Cavities on chest x-ray or CT scan-
  - History of cough or hempotysis, OR
  - Pulmonary or extra-pulmonary TB in children <5yrs or age for identification of the source case
- Duration of Exposure

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## Hospital Contact Investigations

- State governments have different degrees of regulatory authority over health-care settings
- Personnel collaborating with hospitals should have knowledge of applicable legal requirements
- Infection control practitioners might not be familiar with TB contact investigations. Such investigations should be planned jointly as a collaboration with the health department

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## Objectives of a Congregate Site Assessment

- Initial discussions should include data sharing, regulations, confidentiality, media coverage, and occupational health
- Provide education to all those involved including contacts identified
- Minimize anxiety due to TB exposure

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## Assessing The Need To Initiate an Investigation

- Information collected from the medical record review and index case interview is necessary in determining the level of infectiousness of the patient
  - Decision based on review of bacteriology/pathology results, radiographic findings and symptom history
- Infectious period
  - *Estimates* the period of time index case was determined to be infectious
  - Allows for questions to focus on identifying high and low risk contacts and all potential exposure sites

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## Site Assessment

- Assess the risk for TB transmission and the individual risk of contacts for progression to TB disease
- Build credibility and maintain control over the evaluation process by using sound public health practice – identify those contacts at highest risk for exposure and proceed to low risk contacts ONLY if results indicate the necessity to do so

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## Assessing - 3

- Current CDC guidelines recommend that all potential settings for transmission should be visited within 5 business days of initiating the contact investigation *or upon identification of setting*

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## Confidentiality

- Disclosure of the index case is frequently necessary to assess the exposure for potential contacts
  - Authorities within the congregate setting often need to assist the investigator to determine individuals shared the same air space with the index case and for what period of time
  - The disclosure of the name of the index case should be given ONLY to the person or persons assisting in the site assessment

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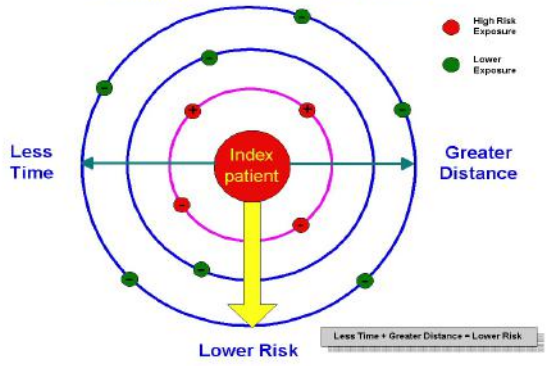
Test **all** or test small?

Test **everyone** or test no one?

**Concentric Circle Model in TB Control**
**Identifying Contacts at Risk of Exposure**

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"No Matter How Hard The Winds Howl—Don't Panic—Take Things One Step At A Time"

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# Case Study #2

Rutgers, The State University of New Jersey

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## Background

- 20 year old male that migrated from Mexico
- Patient moved from W. Virginia January 2005
- History of a + PPD as per patient in W. Virginia done for employment
- Abnormal chest X-ray as per patient (no documentation)
- Started on INH but patient states only took for three months because he moved to NJ
- Drank 12 beers on weekends admitted to cocaine use
- States he had an aunt that died of TB in Oct. 2004 in Mexico

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## Background (2)

- Resides in an inner city
- Unsafe neighborhood
- Second floor four room apartment for 16 people
- Unable to locate (UTL) X2 days, moved without notice
- Moved to a two story private home same 16 people

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## Background (3)

- 1/25/05 patient presents to ER with symptoms of progressive, productive cough x 1-2 weeks, Temp of 102.8, right chest pain greater on inspiration, nausea, vomiting and weight loss of 10 lbs.in one week
- Chest X-ray done in ER
- HIV testing negative
- Sputum + for (AFB + 3)
- Multiple cavitary lesions seen bilaterally

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## Background (4)

- 1/26/05 received a call from Infection Control patient left AMA
- 1/28/05 Patient found and started on RIPE
- 3/04/05 sensitivities resistant to Rifampin, INH, Strep
- 3/16/05 Emb, PZA, Levaquin ,Cycloserine, Capriomycin IM
- 5/4/05 results from National Jewish only resistant to INH
- 5/5/05 Started on Rifampin 600mg

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## Background (5)

- 1/28/05 16 contacts are identified in the home
  - 2 are critical infants < 1yr
- 2/2/05 14 TST done in the home
  - 16 year old and her 7mo. old infant (# 1) not home for appointment (index cases partner)
- 2/4/05 TST results read at home visit
  - 9 Adults positive
  - 2 Adults negative
  - 2 school age children positive
  - Infant #2 (2 mo.) negative (Scheduled for x-ray)

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## Background (6)

- 2/4/05 All 12 scheduled for x-ray
- 2/6/05 spoke with index cases partner regarding testing for her and infant # 1
- 2/8/05 10 x-ray's done; all negative (two adult n/s).
- 2/22/05 work site done by HD none identified
- 3/4/05 9 showed for medical evaluation
- 3/9/05 placed on preventative therapy Emb, PZA

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## Infant # 1 follow-up

- 1/31/05 partner and infant #1 had TST at PMD as instructed via hospital ID physician on 1/26/05
- Infant #1 TST negative
- Partner (infant # 1 mom) TST 14mm
- 2/27/05 Infant #1 X-ray abnormal. PMD starts antibiotics for viral infection despite prior knowledge of TB contact.
- 2/27/05 partners x-ray normal

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## Infant # 1 Becomes MDR Suspect

- 3/9/05 X-ray reviewed by HD TB doctor. Read as highly suspicious of active TB. Discussed with PMD and a new X-ray was ordered.
- 3/13/05 X-ray repeated at the hospital. Infant # 1 admitted r/t abnormal CXR and started on Ripe
- 3/14/04 HD coordinated communication and consult between hospital ID doctor and pediatric TB expert at Lattimore Clinic regarding possible MDR and new medication
- 3/16/05 medication changed to ethionamide, PZA, EMB and Gatifloxacin

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## Infant # 1 continued

- 3/16/05 gastric aspirate smear negative, culture pending
- 3/18/05 (Fri) patient was to be discharged. However, state did not supply gatifloxacin. State also out of ethionamide
- Spoke with discharge planner and ID doctor requesting baby stay the weekend to resolve medication issue and have more time to teach mom to administer the meds on the weekend
- After working with the discharge planner and the state gatifloxicin was obtained from a pharmacy through patients insurance. The ethionamide was delivered to HD (borrowed from Lattimore)
- 3/22/05 baby discharged and started on DOT
- 6/2/05 sensitivities show resistant to INH and rifampin

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## Problem Indicators

- Patients constantly relocated without notice and quickly
- Working poor/unemployed
- Very young index case 20 years old
- Lack of education and knowledge
- Language barrier (most speak Spanish)
- Transportation to clinic
- Availability of medication
- Lack of basic needs

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## Attempted Problem Resolutions

- Assistance with back rent and electric bill through state program to avoid relocating
- Bus tickets provided to original index case for clinic visits
- Incentives given weekly
- Use of language line and Spanish speaking outreach workers

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## Outcomes

- Index case smear negative X3
- Index case on daily DOT compliance 100%
- Partner of index case and infant #2 daily DOPT
- All contacts medically evaluated on preventive therapy
- 2 contacts in need of X-ray referred to HO were found received x-rays and started on therapy
- All repeat TST were negative
- Cases completed 2 years of treatment
- Several of the contacts did not complete

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## Challenges

- Maintaining this DOT for the extended time it took without losing patients to follow up
- Having basic needs met
- Lack bi-lingual staff
- Large group to coordinate care for
- Index patient was on daily IM injections for 2 months then three times a week for 4 months
- DOT done by nursing staff
- Giving medication to an infant that became a toddler during her treatment of 2 years

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## Lessons Learned

- Reinforces importance of a prompt and thorough contact investigation
- The locus of control is not with the patient
- Importance of establishing partnerships and communicating with other outside agencies
- The need for education among PMD
- Difference between children and adult exposure

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## Five Years Later

- TB suspect is reported to the HD which was one of the contacts that did not complete treatment
- A contact investigation found two more cases in the home another one was an original contact that did not complete prophylaxis
- Another TB case was reported from one of the original index cases addresses
  - Genotyping showed a match to the original MDR index case
  - MDR medication was added to the regimen while waiting for sensitives



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# Case Study #3

Rutgers, The State University of New Jersey

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## Background

- 59 year old US born male
- Had TB 20 years ago
- HIV positive for twenty years
- Illegal drug user years ago
- Hepatitis C with cirrhosis
- Seen at Transplant Unit until 2011; MELD score initially 40; off transplant list when score 18
- Severe neuropathy

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## Background (2)

- Amputee of the right leg due to an infection
  - Has been bedridden for two years due to complications of the amputation
  - Moving is very painful
- Relies on his wife to care for him
- Needs an ambulance service to get to appointments which is expensive
- Diagnosed with TB and started on RIPE in the hospital
- Taking Truvada® and Kaletra®
- Moving is painful

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## Where do we start?

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## Triple threat – Case issues

- Drug-drug interactions with PI's (Kaletra®)
- Limitation of TB drug choices in cirrhosis
- Guestimate of weight in patient with above knee amputation
- Other limiting features – narcotic-dependent neuropathy; bedbound, sometimes alone
- Undiagnosed left leg lesion, changeable – need biopsy
- Patient had elevated liver enzymes from INH

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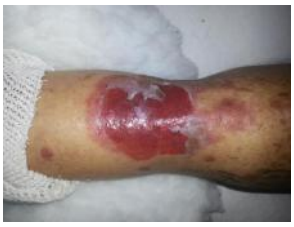
## Additional Detail – Skin Lesion



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## Initial Interview

- Reviewed all of the patient's medications
  - Patient was on rifampin which would interfere with HIV regimen
  - Patient was splitting doses
  - EMB 1200mg and PZA 1500mg; doses too high for his weight (approx. 120 lbs)
  - Concerns of medications that may be hepatotoxic
- Had no follow-up scheduled with ID doctor
  - ID doctor referred his TB care to the clinic
- Did have a visiting physician as his primary MD
- Had no HIV case manager
- DOT difficult because he cannot open the door and has a dog that bites and needs to be outside when someone visits

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## Overcoming Barriers

- Obtained all of the patient's medical records from all his stays for MD to review
- Requested a home visit from clinic doctor
- Contacted the visiting physician's nurse practitioner to set up a time for labs to be done in the home
- Contacted the HIV program to set up case management
- Patient DOT is done by Tango daily with a home visit by a nurse once weekly
- The ordered a scooter for him to get around

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# Questions?