TB Infection Control and Case Management

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Objectives

- When to place a patient INTO isolation
- When to remove a patient FROM isolation
- How to best PROTECT you and your staff from TB infection
- How to REDUCE the duration of isolation
- When can a TB patient go home?
- What is the role of Public Health Department?

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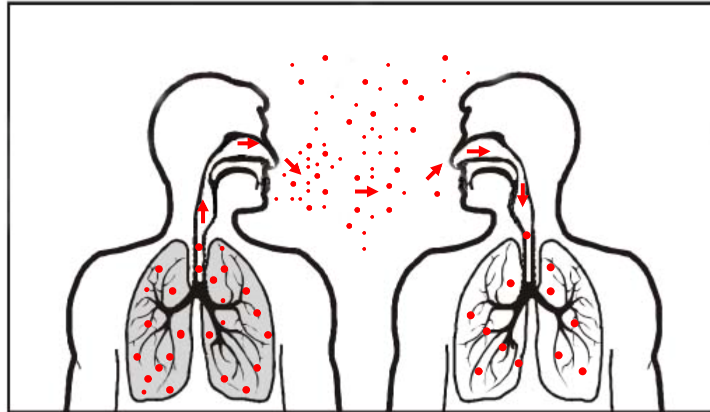
TB Transmission (4)



Dots in air represent droplet nuclei containing *M. tuberculosis*

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Hierarchy of Infection Control

Administrative Controls

Environmental Controls

Respiratory Protection

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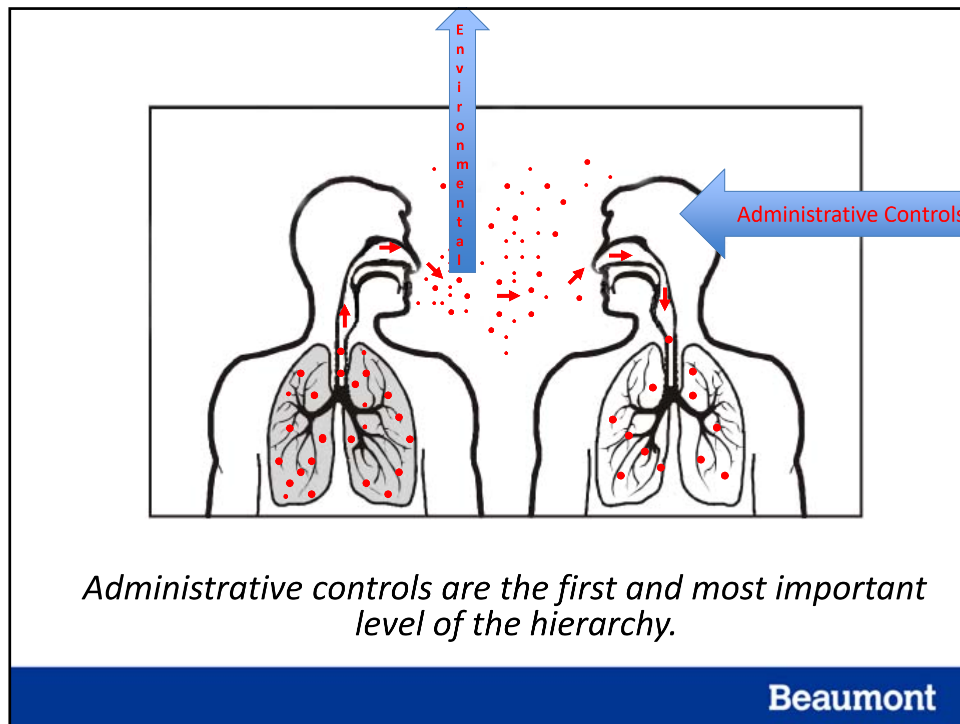

Administrative controls are the first and most important level of the hierarchy.

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Suspect TB if…

- Cough > 2-3 weeks
- Gross hemoptysis
- Exposure to TB?
- +PPD or IGRA?
- From endemic country?
- Substance abuse or HIV?

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Case Example
My hospital ER August 2018

- *"Blood in vomit, x 1 day, pt reports 30 weeks pregnant, some abdominal cramping, denies vaginal bleeding. pt states blood tinged sputum with cough also; pt does report dx pneumonia 1 month ago and hospitalization at st joe's"*

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- ER physician notes gross hemoptysis 2 tablespoons.
- Notes patient from Guinea in 2016
- Airborne Infection Isolation ordered before X-rays done

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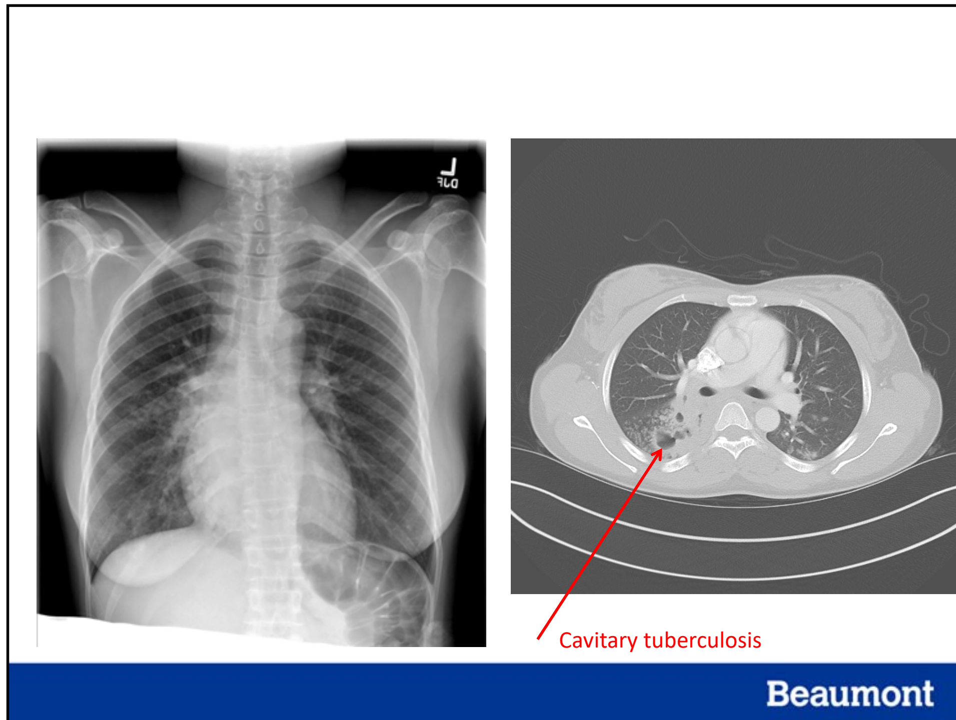

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What was the most important component for Infection Control?

- **Administrative component**

- Cognitive awareness on the part of ER physician
- Isolate 10 patients to discover 1 case of active TB!

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7 factors that affect the infectiousness of a TB patient.

- Presence of a cough
- Chest x-ray showing cavity in lung
- Positive acid-fast bacilli sputum smear result
- TB of lungs, airway, or larynx
- Patient not covering mouth or nose when coughing
- Not receiving adequate treatment
- Undergoing cough-inducing procedures

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Airborne Infection Isolation (AII)

- Private room
- Negative pressure with 6-12 air exchanges per hour
- Signage
- N95 respirators

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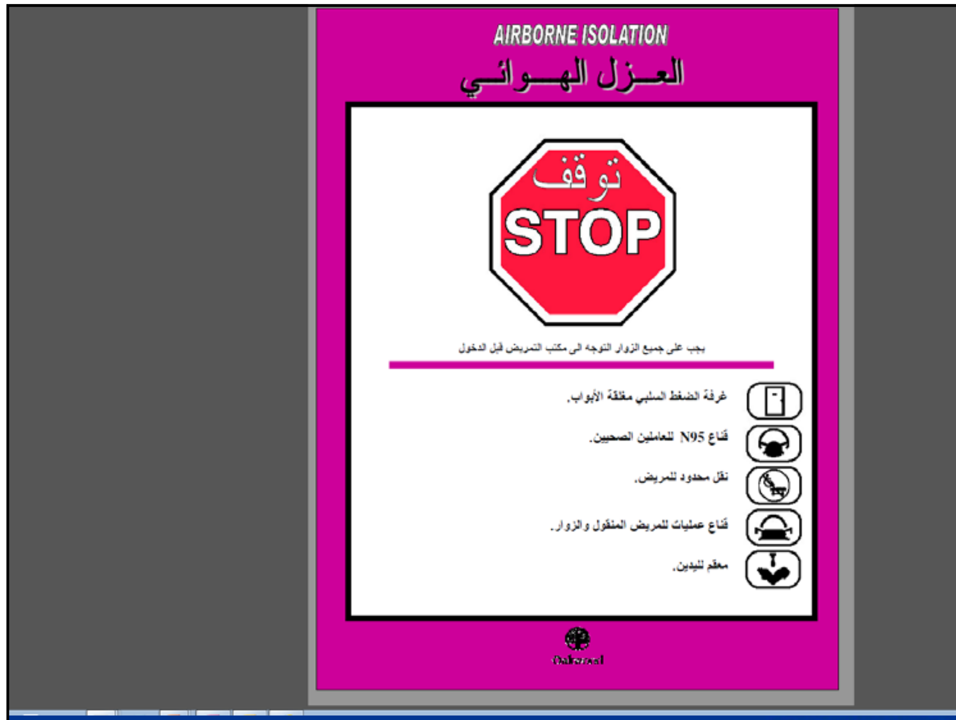

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Ventilation Technologies (6)

Mechanical Ventilation

- AII rooms are designed to prevent spread of droplet nuclei expelled by patient
  - Negative pressure
  - Clean air flows from corridors into AII room
- Air cannot escape AII room
  - Exhausted outdoors or passed through filter

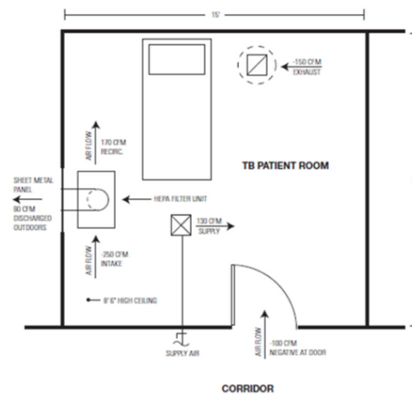

Image credit: Francis J. Curry National TB Center

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Respirator for Health-Care Workers

- Health-care worker wearing a respirator

- Respirators
  - Designed to filter out droplet nuclei from being inhaled by the health-care worker and other individuals
  - Should properly fit different face sizes and features
  - Should NOT be worn by the patient

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Surgical Mask for Persons with Infectious TB Disease

- Infectious TB patient wearing a surgical mask

- Surgical masks
  - Designed to stop droplet nuclei from being spread (exhaled) by the patient
  - Should NOT be worn by the health-care worker

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What is a placebo mask?

- Only 1 strap, instead of 2
- Held to face with a hand
- Facial hair interferes with seal

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The pregnant TB patient is moved from ER to an Isolation Room on the Medical Floor…..

- When can the ER room be used again?
- 46 minutes to remove 99% of airborne contaminants
- 60 minutes is considered adequate.
- MMWR Dec. 30, 2005

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>90% of Isolation patients don't have TB. How do we get them released quickly?

- Sputum quality critical
- Induce with nebulizer if needed
- AFB smear
- Plus NAAT (PCR) regardless whether AFB smear is positive or negative.

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Consensus statement on the use of **Cepheid Xpert MTB/RIF®** assay in making decisions to discontinue **airborne infection isolation** in healthcare settings

http://www.tbcontrollers.org/resources/airborne-infection-isolation

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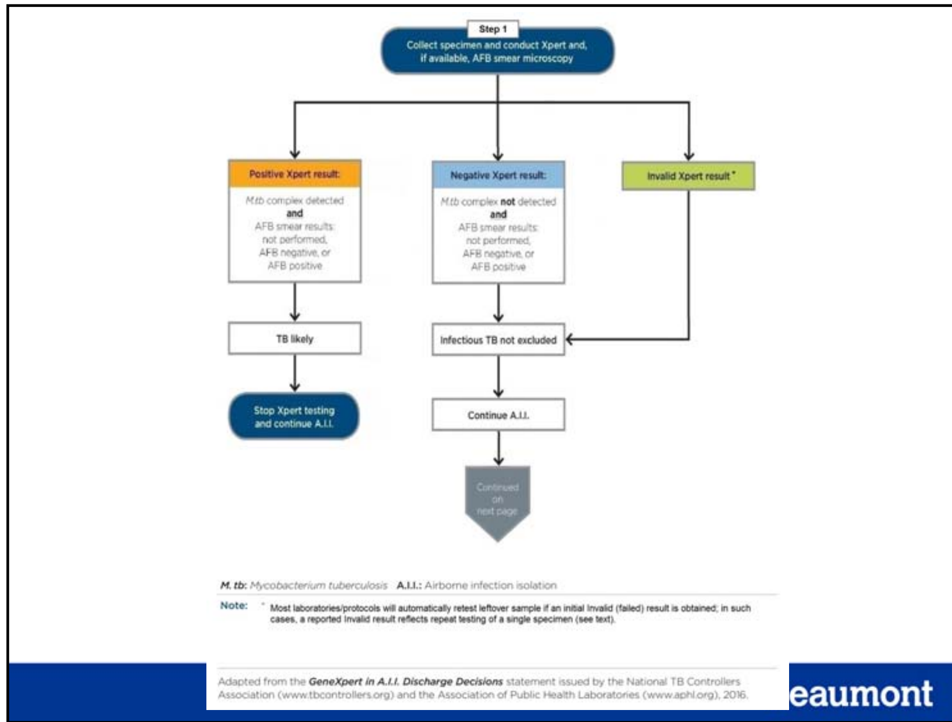

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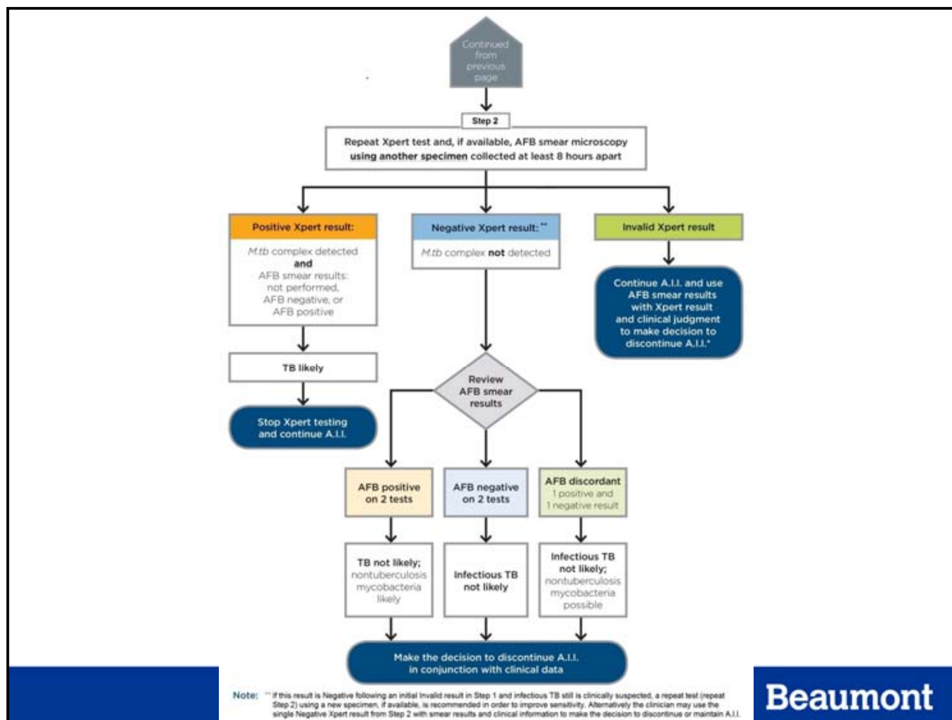

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Remove from Isolation?

- Airborne precautions can be discontinued when infectious TB disease is considered unlikely and either
  - Another diagnosis is made that explains the clinical syndrome,
  - The patient has three negative AFB sputum smear results, or
  - The patient has a sputum specimen that has a negative NAA test result and two additional sputum specimens that are AFB-smear negative.*

or

  - GeneXpert® neg x 1 (or 2) - *Good* Sputum samples!**

From John Bernardo, MD

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Remain in isolation

- TB is confirmed, or very strongly suspected.
- Start effective TB medications
- Intubation is not a substitute for Isolation status

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Duration of Isolation once TB treatment started

- Patients rapidly become noninfectious after effective multiple-drug chemotherapy instituted.
- Rapid elimination of viable MTB from sputum, and reduction in cough frequency.
- But no ideal test exists to assess the infective potential of a TB patient.

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Start INH, RIF, PZA, EMB

- 90% reduction in viable MTB in 48 hours
- 99% reduction by 14-21 days of treatment.
- Is patient going home, or remaining in hospital?

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Criteria for determining when during therapy a patient with pulmonary TB has become noninfectious (MMWR Nov. 4, 2005)

- Negligible risk of MDR TB
- Received standard TB treatment 14-21 days
- Complete adherence by DOT
- Clinical improvement
- Close contacts identified and evaluated.
- AFB smears show reduced or negative organisms

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What Happens When a TB Case is Reported – Local Health Department Responsibilities

- Nurse Case Manager/DOT Nurse receives the report or phone call from ICP/MD
  - Responsible for the outcome of TB suspects/cases/contacts from initiation of treatment until discharge
  - Obtain patient's complete hospital record e.g. radiographic images, lab reports, etc.

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What Happens When a TB Case is Reported-2

- Review report for medical information and accuracy
  - How infectious or potentially infectious is the patient
  - Are they medically stable
  - Correct regimen
  - Barriers to discharge
    - Homeless
    - Vulnerable population in the home

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What Happens When a TB Case is Reported-3

- Outreach worker or DOT nurse interviews the patient in the hospital within 3 days after receiving the report
  - Reviews hospital records
  - **Hospital visit**
  - Evaluate patient's knowledge and beliefs about TB
  - Provide education based on patient's current knowledge and ability to comprehend written, verbal and visual information
  - Contact investigation is initiated

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What Happens When a TB Case is Reported-4

- Home visit is made to verify address, living arrangements and contacts
- Establishes plan for DOT upon discharge and medical supervision – clinic vs. private MD
- Ensures patient has follow-up appointment and no interruption in treatment
- Participates in discharge planning
- Builds rapport

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Communication with Case Management and Public Health

- Infection prevention, case management and public health must work together in discharge planning
- Specific needs of the patient must be identified early on
- No two cases are the same
- Team must decide best plan of care after discharge for the patient

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Discharge Planning-2

Date Form Completed: ____________

Discharge Planning: SUSPECTED/CONFIRMED TUBERCULOSIS

*Utilize this checklist to ensure every requirement and need has been addressed **BEFORE** a TB patient is discharged. The patient should not be discharged until all points are addressed.*

Patient Name: ____________________ **DOB:** __________ **Discharge planner name:** ________________

Patient's local health department: __________________________ **Phone:** (___) ________________

Provider responsible for ongoing treatment: ___________________ **Phone:** (___) ________________

All proven and suspected TB cases must be **reported within 24 hours** to the patient's local health department. The case can be a suspect and does not have to be confirmed in order to report. For a list of local health departments and contact information, visit www.malph.org/directory.

Medical records including radiology films, lab results, and notes are not subject to HIPAA when sent to a local health department. This includes future medical records pertaining to TB management. Michigan Public Health Code authorizes the Michigan Department of Health and Human Services and local health departments to investigate any active or suspect TB case. To read more, go to http://www.michigan.gov/documents/Director_HIPAA_and_communicable_disease_110947_7.pdf

1. Has the hospital discharge planning team and the patient's local health department agreed upon a discharge plan at least 48 hours prior to discharge? Y N
2. Has the attending physician discussed the case directly with the local health department Medical Director or TB Nurse Consultant? Y N
3. Has the local health department nurse visited the patient in hospital? Y N
4. Have arrangements for airborne isolation been made? Y N
5. Is the patient tolerating daily doses of TB medications? Y N
6. Has the patient received education in their primary language about the TB treatment plan, including directly-observed therapy? Y N
7. Has patient's primary and secondary contact information been verified? Y N
8. Has an outpatient follow-up appointment been scheduled? Y N

   Appointment date, time, and location is: ____

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Discharge Planning -2

- Request 48 hours notice prior to discharge
- Request not to have patient discharged on a Friday
- Ensure the criteria for discharge is met utilizing the Discharge Planning Checklist

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Going Home

- No minimum number of days of anti-TB treatment before going home if:
  - On treatment, likely to be susceptible
  - Showing clinical improvement
  - DOT arranged
  - Home Isolation agreement
  - Does not need negative AFB smears

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Recommended Criteria for Hospital Discharge of the Infectious Patient

- The patient has a stable residence that is validated by the TB nurse case manager

AND

- The residence is **not** shared by any person(s) who is a member of a vulnerable population unless the person(s) has been diagnosed with LTBI
  - Vulnerable population are those individuals who are immuno-compromised for any reason or <5 years of age

OR

- TB has been ruled out as the cause of the patient's illness??

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Recommended Criteria for Hospital Discharge-2

- If the patient:
  - Is a resident of a congregate living facility
  - Is homeless
  - Reports a private residence that the TB nurse case manager has not verified as being valid or stable **OR**
  - Has a private residence where uninfected members of a vulnerable population reside

If any of the above conditions exist, the patient MUST meet one of the following criteria before discharge: →

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Recommended Criteria for Hospital Discharge-3

- Have 3 consecutive sputum smears negative for AFB collected at least 8-24 hours apart (with one early morning sputum)
- Have at least one sputum culture negative *M.tb* after TB treatment has been initiated
- Negative NAAT
- Is granted an exemption by the Health Dept. based on clinical evidence and patient interview, if none of the above conditions have been met
- Had no sputum smears + for AFB, been on TB treatment for at least 2 weeks and no current respiratory symptoms

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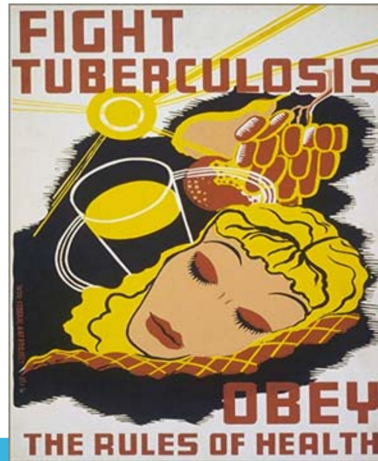
Recommended Criteria for Hospital Discharge-4

- If the infectious or potentially infectious patient does not meet the criteria for discharge or patient non-adherence/risk of flight has been documented during the hospitalization, discharge should be delayed



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Appropriate Discharge

Protects the community against transmission

- Patients can only be discharged while infectious with:
  - Stable residence
  - No vulnerable residents in household
  - Agreement to self isolate until non-infectious
- Otherwise, must be kept in an Airborne Infection Isolation (AII) room until documented non-infectious
- Must coordinate discharge with TB nurse case manager

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Outpatient diagnosed with TB

- Prompt response by the Nurse Case Manager/DOT Nurse is needed to have the patient started on treatment and evaluate the household contacts
- A home or clinic visit should be initiated quickly to assess the patient
- An on-going assessment should occur every DOT/monthly clinic visit

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Infectious Patient Diagnosed Outpatient

- Collect a sputum
- Clinic appointment as soon as possible
- Discuss DOT
- Utilize patient–centered approach
- Work collaboratively with patient, the physician and the family to identify treatment barriers and develop strategies to meet the patient needs
- Evaluation of household, workplace and other contacts

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1st Clinic Visit

- Provide a surgical mask and instruct patient on proper use, for clinic appointment
- Isolate patient in a separate exam room
- If a patient is very infectious, try to schedule as the last appointment to have less patients in the clinic or first appointment before the other patients come in.
- A note is placed on the chart to alert the clinic staff especially the check-in staff that patient is potentially contagious
- Do not make the appointment during appointments of vulnerable populations (e.g. children, HIV)

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Monitor Patient

- Collect sputum monthly until negative cultures/smears for 2 consecutive months
- Monitor patient for symptom improvement
- Monthly visit to TB clinic
- Keep infection control measures in place until patient is no longer infectious

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Returning to work or school

- 14 days treatment minimum
- Clinical improvement
- Number of AFB decreasing
- Appropriate worksite
- Outdoor work or solitary work may return earlier
- Decision must involve Health Department.

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Immediate/Imminent Public Health Risk

- Definition: A patient with suspected or confirmed infectious or potentially infectious TB disease who does any of the following:
  - Threatens to leave hospital against medical advice (AMA)
  - Leaves hospital AMA
  - Verbalizes or demonstrates non-adherence with infection control measures
  - Refuses to take medications as prescribed
  - Threatens to travel on public conveyance

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THINK TB

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THANK YOU!

QUESTIONS?

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Think TB

- Health care workers must be trained to ask questions that will facilitate detection of persons who have suspected or confirmed TB infection
- The medical evaluation must be conducted in the patient's primary language using an interpreter if needed
- There should be 'red flags' or key words that raise the suspicion for TB

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TB Triage Reviews with ER, Pulmonary and Infectious Disease staff

- Review last year's active TB cases
- Review variable radiological presentations of TB
- Review the time from presentation to placement in Airborne Infection Isolation

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What Happens When a TB Case is Reported-5

It is crucial that the eight elements of case management are utilized:

1. Case Finding
2. Assessment
3. Problem identification
4. Development of plan of care
5. Implementation
6. Outcome identification
7. Evaluation
8. Documentation

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Notification of Precautions to Protect Public Health

- A document that explains the appropriate precautions the patient needs to take while infectious is reviewed with the patient at the hospital or home
- It outlines the infection control measures with which the patient must adhere to in order to protect the public until rendered non-infectious

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Notification of Infection Control Precautions

Patient's Name:______________________________________ DOB: ___________

The public health department has determined that your suspected or confirmed TB disease presents an imminent danger to the health of the public. As a result, you are instructed to adhere to the following infection control measures until you are informed by the public health department that it is no longer necessary.

In the hospital, you must:

- Remain in your assigned hospital room unless or until you are moved by hospital personnel.
- Cover your mouth and nose whenever coughing or sneezing.
- Take all medications as prescribed.

After hospital discharge, you must:

- Remain in your residence and/or outdoors on your residential property, except for trips approved by the public health nurse case manager. A respirator must be worn as deemed necessary by the nurse case manager.
- Cover your mouth and nose whenever coughing or sneezing.
- Keep all TB-related medical appointments and take all medications as prescribed.
- Attain prior approval from the public health nurse case manager for visitors entering the residence. Without prior approval, visitors must remain outdoors and may not enter the residence.
- Not visit homes of others, churches, schools, workplaces or other public or private places where you are in contact with others.
- Not use public transportation or taxis.

I acknowledge receipt of these conditions and recognize that failure to adhere with the conditions places the public at risk for transmission and may result in legal action against me.

Patient signature: ______________________________________ Date: ___________

Witness name: ______________________________________

Witness signature: ______________________________________ Date: ___________

Appendix 6

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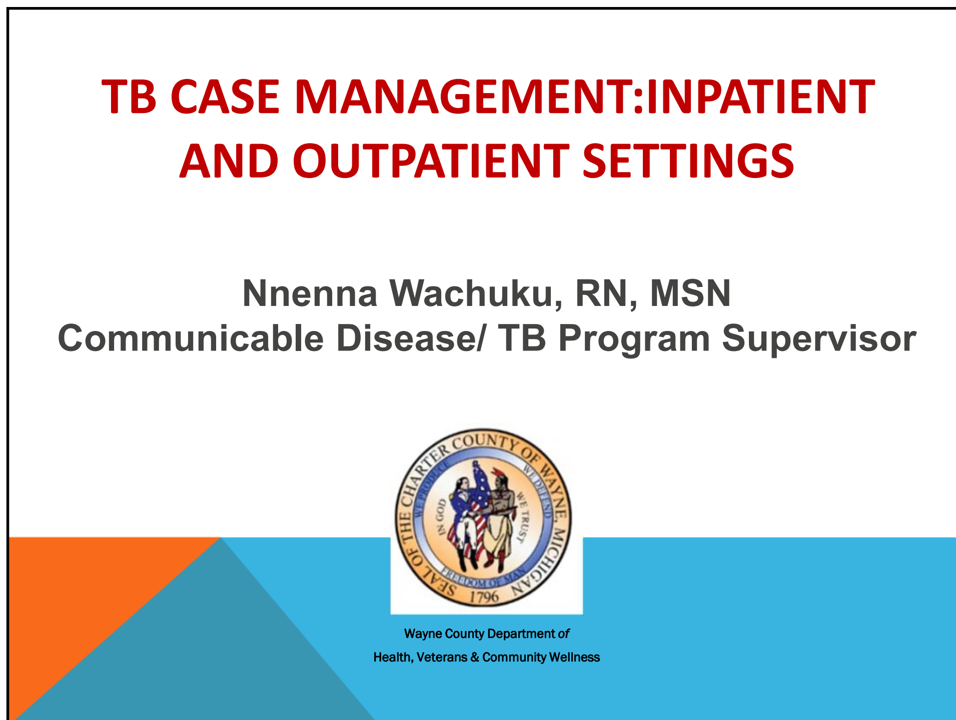

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Discharge Planning

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Initial Visit with the Nurse

Assessment should include:

- Weight
- Vitals
- Assessment of symptoms
- Medical history
- Interview to establish infectious period
- Assessment of living space and household contacts
  - Is there space to home isolate
- Providing the patient with a surgical mask
- Educate patient and family on TB and home infection control measures

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Think TB

- Assess all TB infection for TB disease
- “THINK TB!” - there should be a triage plan and if possible a separate room to place the patient
- Patient <u>must</u> be offered a surgical mask
- Precautions should be initiated for signs or symptoms of TB disease or if patient has known TB disease and has not completed anti-TB treatment
- Use signage in the waiting area of TB symptoms and cover your cough
- Train staff

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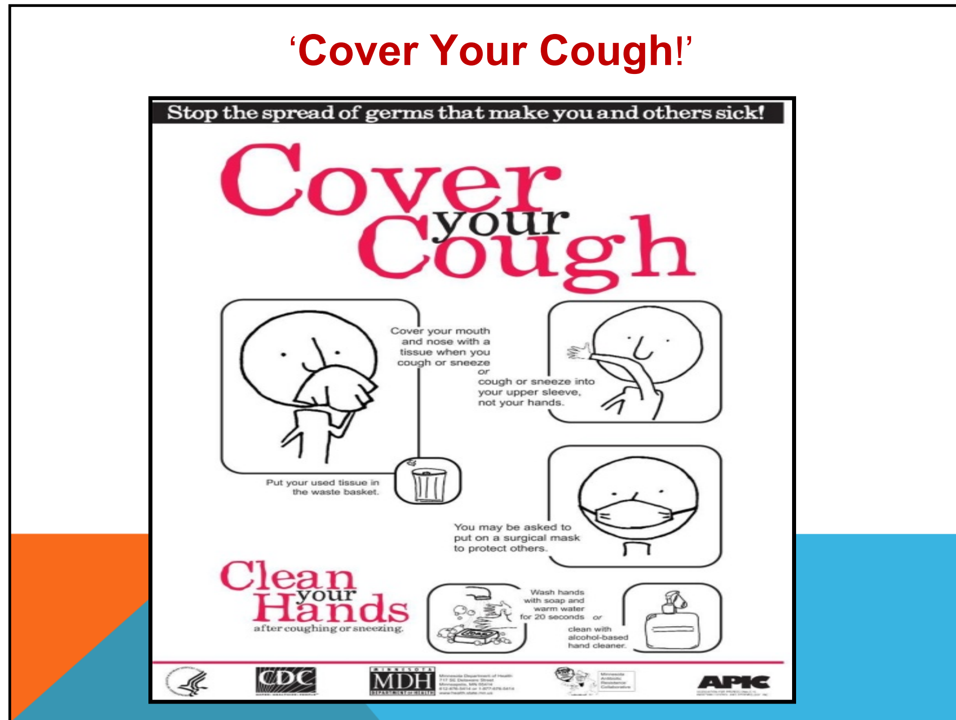
‘Cover Your Cough!’



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Think TB

Symptoms related to cough/respiratory tract

- Consider TB for any patient with symptoms of infection in the lung or airways
- Cough for > 3 weeks
- Bloody sputum of hemoptysis
- Hoarseness
- Other signs, symptoms and factors
- Loss of appetite
- Unexplained weight loss
- Fever
- Fatigue
- Chest pain
- Travel history
- Homeless population
- Recent incarceration or residence in a group setting

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TB RESOURCES

- Centers for Disease Control and Prevention (CDC)
  - https://www.cdc.gov/tb/
- Michigan Dept. of Health & Human Services (MDHHS)
  - www.michigan.gov/tbinfo
- Rutgers Global Tuberculosis Institute New Jersey
  - http://globaltb.njms.rutgers.edu/

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Thank You !

Questions?

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