WORKING THROUGH LATENT TUBERCULOSIS INFECTION (LTBI)

HIV-NEGATIVE ADULTS

A DIAGNOSIS AND MANAGEMENT ALGORITHM FOR PRIMARY CARE PROVIDERS

Washtenaw County Health Department Tuberculosis (TB) Control Program

March 21, 2019

Washtenaw County Health Department

1

OBJECTIVES

- Understand the importance of LTBI screening and treatment in the role of TB elimination.
- Review Washtenaw County's LTBI testing, diagnosis, and treatment algorithm.
- Discuss how Washtenaw County uses this algorithm to address LTBI in the county.

Washtenaw County Health Department

2

WASHTENAW COUNTY HEALTH DEPARTMENT TUBERCULOSIS (TB) CONTROL PROGRAM

SERVICES

- **Bi-monthly evening clinic**
- **24 hour support**
  - Patients
  - Local and regional health care providers
- **Direct Observational Therapy (DOT)**
  - Traditional (in-person) DOT
  - Video DOT
- **Case-management**

STAFF

- **TB Physician Consultant:**
  - Dr. Robert Dickson
  - (Dr. Dana Kissner: back-up)
- **TB Nurses:**
  - **TB Nurse Coordinator (full-time):**
    - Mary McCloud
  - **TB Nurse Staff (part-time):**
    - Karen Manni
    - Kelicia C. Byrd

3

WASHTENAW COUNTY HEALTH DEPARTMENT TUBERCULOSIS (TB) CONTROL PROGRAM

Mission

- **Legal responsibility for preventing and controlling TB in the community by:**
  - Identifying and treating persons who have suspect/active TB and ensuring they complete appropriate therapy.
  - Identifying and screening contacts of persons with TB to determine whether they have latent TB infection or active disease and providing appropriate treatment.
  - Screening high-risk populations to detect persons with latent TB infection and providing appropriate treatment to prevent progression to disease.

Washtenaw County Health Department

4

WASHTENAW COUNTY HEALTH DEPARTMENT TUBERCULOSIS (TB) CONTROL PROGRAM

Mission

- **Legal responsibility for preventing and controlling TB in the community by:**
  - Identifying and treating persons who have suspect/active TB and ensuring they complete appropriate therapy.
  - Identifying and screening contacts of persons with TB to determine whether they have latent TB infection or active disease and providing appropriate treatment.
  - Screening high-risk populations to detect persons with latent TB infection and providing appropriate treatment to prevent progression to disease.

Washtenaw County Health Department

5

IMPETUS FOR CREATING A LTBI PROTOCOL FOR PRIMARY CARE PROVIDERS IN WASHTENAW COUNTY

- Capacity
- Empowerment
- Partnership

Washtenaw County Health Department

6

TUBERCULOSIS CASE RATES

Tuberculosis Case Rates					
	2018	2017	2016	2015	2014
United States		2.8	2.9	3.0	2.9
Michigan	1.1	1.3	1.3	1.3	1.1
Washtenaw County	2.4	2.2	2.8	1.7	1.9
Wayne County	2.3	2.5	3.1	2.5	2.3
Oakland County	1.5	2.0	1.3	1.4	1.4
Macomb County	0.6	1.4	1.3	1.6	1.2

Note: case rates are expressed as # of cases per 100,000 population; Population data used for each year are the most recent U.S. Census Bureau estimates for each year as of 02/14/2018.

MDHHS: https://www.michigan.gov/documents/mdhhs/2016MI_County_TUBERCULOSIS_CASES_552484_7.pdf
CDC: https://www.cdc.gov/tb/statistics/default.htm

7

SCOPE OF THE PROBLEM

LTBI Reactivation:

- Reactivation of LTBI is a significant source of TB disease.
- Exposure to *Mycobacterium tuberculosis*: 30% will develop LTBI
  - Untreated: 5-10% will progress to active TB disease.
  - >80% TB cases (in U.S.) due to reactivated LTBI.

Washtenaw County Health Department

8

CRITICAL STRATEGY FOR ELIMINATION OF TB IN U.S.

Screening and treatment of persons at high-risk:

- LTBI
- Developing TB disease once infected with M. tuberculosis

-U.S. Public Health Service
-CDC

Washtenaw County Health Department

9

WCHD LTBI Diagnosis and Management Protocol

10

WCHD LTBI Diagnosis and Management Protocol

Protocol

11

WCHD LTBI Diagnosis and Management Protocol

Protocol

Algorithm

12

WCHD LTBI Diagnosis and Management Protocol

Protocol

Algorithm

Rx Table

13

RISK FACTORS FOR TB INFECTION OR PROGRESSION

- **Individuals born in or who frequently travel to countries where TB is endemic**
- **People who live in or have lived in high risk congregate settings** (e.g. correctional facilities or homeless shelters or illicit drug use in group setting).
- **Individuals who are in close contact with a person who has active TB disease.**
- **Healthcare workers and others who work in hospitals, nursing homes and other types of healthcare facilities .**
- **Immunosuppressed individuals** including:
  - HIV infection
  - Hx organ transplant
  - Treatment with immunosuppressive medications:
    - TNF-alpha antagonist
    - Steroids dose (10-15mg/ per day for more than one month)
    - Other

Washtenaw County Health Department

14

A HIGHER RATE OF DISEASE PROGRESSION FOR INDIVIDUALS WITH:

- HIV infection
- Immunosuppression
- Diabetes Mellitus
- History of cigarette smoking
- History of illicit drug use

Washtenaw County Health Department

15

DIFFERENTIATING BETWEEN LTBI DISEASE & TB

LTBI

- **No symptoms or physical findings** suggestive of TB disease.
- **TST or IGRA result usually positive.**
- **Chest radiograph is typically normal.**
- If done, respiratory specimens are smear and culture negative.
- **Cannot spread TB bacteria to others.**
- Should consider **treatment for LTBI** to prevent TB disease.

TB Disease

- **Symptoms may include:** fever, cough, chest pain, weight loss, night sweats, hemoptysis, fatigue, and decreased appetite.
- **TST or IGRA result usually positive**, though may be negative, especially in newly infected or immunosuppressed patients.
- **Chest radiograph is usually abnormal in pulmonary disease.** However, may be normal in persons with advanced immunosuppression or extrapulmonary disease.
- **Respiratory specimens are usually smear or culture positive in pulmonary disease.** However, may be negative in persons with extrapulmonary disease or minimal or early pulmonary disease.
- **May spread TB bacteria to others.**
- **Needs treatment for TB disease**

CDC: Transmission and Pathogenesis of TB

16

DIAGNOSTIC TESTING
TWO TESTING METHODS

- **The Tuberculin Skin Test (TST)**
  - Detects cell mediated immunity by delayed hypersensitivity reaction to purified protein derivative (PPD).
- **Interferon Gamma Release Assays (IGRA)**
  - Measures the immune response to TB proteins in whole blood.
  - There are 2 FDA approved and commercially available IGRAs :
    - QuantiFERON®-TB Gold In-Tube test (QFT-GIT)
    - T-SPOT®.*TB* test (T-Spot)

17

DIAGNOSTIC TESTING
TWO TESTING METHODS

- **The Tuberculin Skin Test (TST)**
  - Detects cell mediated immunity by delayed hypersensitivity reaction to purified protein derivative (PPD).
- **Interferon Gamma Release Assays (IGRA)**
  - Measures the immune response to TB proteins in whole blood.
  - There are 2 FDA approved and commercially available IGRAs :
    - QuantiFERON®-TB Gold In-Tube test (QFT-GIT)
    - T-SPOT®.*TB* test (T-Spot)
  - **The IGRAs are often preferable to TST for adults with:**
    - Low chance of returning for reading the test
    - Past receipt of the BCG vaccine
  - **IGRA testing does not cause the booster phenomenon that can occur with using TST**

18

DIAGNOSTIC TESTING
TWO TESTING METHODS

- **The Tuberculin Skin Test (TST)**
  - Detects cell mediated immunity by delayed hypersensitivity reaction to purified protein derivative (PPD).
- **Interferon Gamma Release Assays (IGRA)**
  - Measures the immune response to TB proteins in whole blood.
  - There are 2 FDA approved and commercially available IGRAs :
    - QuantiFERON®-TB Gold In-Tube test (QFT-GIT)
    - T-SPOT®.*TB* test (T-Spot)
  - **The IGRAs are often preferable to TST for adults with:**
    - Low chance of returning for reading the test
    - Past receipt of the BCG vaccine
  - **IGRA testing does not cause the booster phenomenon that can occur with using TST**

Important: Neither methods distinguishes between LTBI and TB disease.

19

YOU SHOULD KNOW:
CAUSES OF FALSE-NEGATIVE TST

TST : some individuals may not react to the TST despite TB infection:

- Recent TB infection (within 8-10 weeks of exposure)
- Old TB infection (many years)
- Very young age (less than 6 months old)
- Recent live-virus vaccination (e.g., Measles/Mumps/Rubella, Varicella, and Smallpox)
- Overwhelming TB disease
- Some viral illnesses (e.g., measles and chicken pox)
- Incorrect method of TST administration
- Incorrect interpretation of reaction
- Cutaneous anergy

20

TREATMENT OF LTBI:
AN IMPORTANT PUBLIC HEALTH INTERVENTION

- **Important:** LTBI treatment should be initiated only after TB disease has been ruled out!
- There is a high risk of drug resistance and treatment failure if a patient with TB disease is treated with a single drug regimen.
- Patients with suspected TB disease are managed by the local health department (LHD)
- Multidrug treatment regimen until the diagnosis is either confirmed or ruled out
- Determine need for baseline liver function tests (LFTs)
  - **LFTs normal**: proceed with treatment regimen
  - **LFTs not normal**: call the LHD for guidance

21

TREATMENT OF LTBI:

THE CDC RECOMMENDS SEVERAL REGIMEN OPTIONS FOR LTBI TREATMENT

Note: Patients are more likely to complete shorter treatment regimens

- **INH and Rifapentine (RPT)** or **3HP**: 3 months once weekly under Directly Observed Therapy (DOT) or self-administered therapy (SAT)
- **Rifampin (RIF)** for 4 months daily
- **Isoniazid (INH)** for 9 months daily (or twice weekly under DOT)
- INH for 6 months daily (or twice weekly under DOT)

22

TREATMENT OF LTBI:

THE CDC RECOMMENDS SEVERAL REGIMEN OPTIONS FOR LTBI TREATMENT

Note: Patients are more likely to complete shorter treatment regimens

Regimens commonly used by WCHD TB Clinic:

- **INH and Rifapentine (RPT)** or **3HP**: 3 months once weekly under Directly Observed Therapy (DOT)
- **Rifampin (RIF)** for 4 months daily
- **Isoniazid (INH)** for 9 months daily

Washtenaw County Health Department

23

TREATMENT OF LTBI:

THE CDC RECOMMENDS SEVERAL REGIMEN OPTIONS FOR LTBI TREATMENT

Note: Patients are more likely to complete shorter treatment regimens

Regimens commonly used by WCHD TB Clinic:

- **INH and Rifapentine (RPT)** or **3HP**: 3 months once weekly under Directly Observed Therapy (DOT)
- **Rifampin (RIF)** for 4 months daily
- **Isoniazid (INH)** for 9 months daily

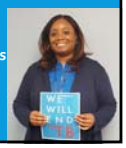
Washtenaw County Health Department

24

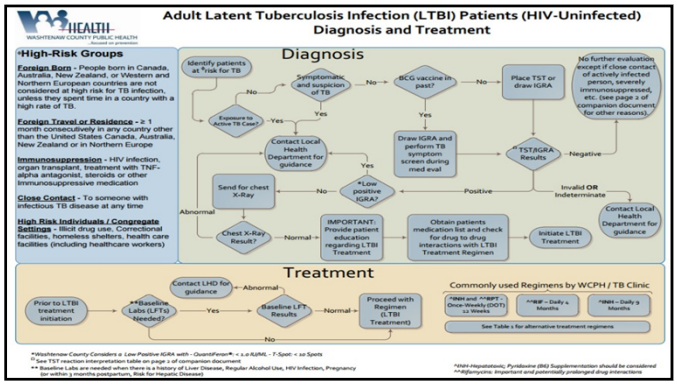
WASHTENAW COUNTY HEALTH DEPARTMENT LTBI PROTOCOL FOR ADULT HIV-NEGATIVE ADULTS

MONITORING:

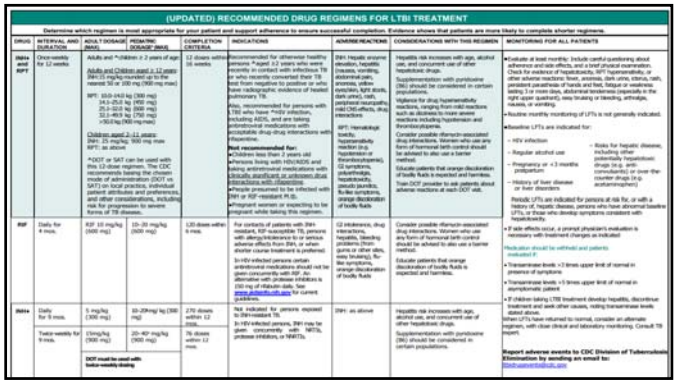
- Determine appropriate level of monitoring
- Periodically assess the patient's progress:
  - Ensurance of safe and effective treatment
  - Components:
    1. Clinical monitoring
       a. signs of hepatitis
       b. adherence to the medication regimen
       c. symptoms of possible adverse drug reactions or interactions
    1. Laboratory testing
    2. Patient education



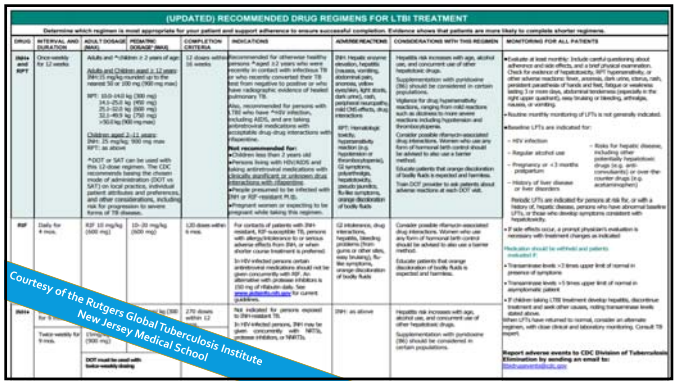
25



26



27



28

CASE #1

- 66 yo male who immigrated to the U.S. from Indonesia 25 years ago presents as new patient for medical evaluation.
- He presents with complaint of cough and runny nose for 1 day. He denies fever, breathing problems, weight loss, or fatigue. He denies any sick contacts.
- His past medical history only includes heavy alcohol use in the past and high cholesterol for which he takes a statin cholesterol medication. Upon questioning, he reports receiving the BCG vaccine in the past.
- His lung exam is normal.
- Is he a candidate for LTBI screen?

Washtenaw County Health Department

29

CASE #2

- 44 yo female who works as a nurse in a nursing home presents as new patient for medical evaluation.
- She reports that she hasn't been able to work for the last two week because of cough, fatigue, and low-grade fevers.
- She reports that several of her patients have been recently sick with respiratory illnesses, but one in particular was recently diagnosed with active TB.
- Her past medical history is negative. She is a previously healthy female. She is not on any medications.
- She has abnormal breath sounds on her lung exam.
- Is she a candidate for LTBI screen?

Washtenaw County Health Department

30

QUESTIONS?

31