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Tuberculosis Screening for Health Care Personnel

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GOVERNMENT OF THE DISTRICT OF COLUMBIA
MURIEL BOWSER, MAYOR

Overview

- Review the three recommended elements of pre-placement tuberculosis screening
- Discuss a possible algorithm for pre-placement TB screening
- Review the options for positive test results
- Discuss options for LTBI treatment
- Review recommendations for serial screening / education
- Review ways to coordinate / contact DC TB Control

Updates on TB

2005 Guidelines recommended all health care personnel should undergo annual TB testing.

BUT

- **TB rates** have **declined 42%** since 2005 (2)
- TB **incidence rates** among health care personnel **were similar** to the **general population (3)**
- New studies have shown that health care personnel have a **low rate** of **TB conversion** (0.3% annually) (4)
- The vast majority of **active cases among health care personnel** are from those with **reactivation of pre-existing LTBI**
- Estimated lower limit of NNS of 1613 to find one active case of TB (1)

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1) WHO 2017, 2) CDC 2017, 3) Labert 2016, 4) Dobler 2012

TB Screening

- A process that includes:
  - TB **risk assessment**
  - **Symptom evaluation**
  - **TB testing** for M. tuberculosis infection (IGRA or TST)
    - **Additional work-up** / treatment for health care personnel with a **positive test** or TB symptoms
- It is ***not***:
  - **A facility risk assessment**
  - **Infection control procedures**
    - Please refer to 2005 CDC Infection Control Guidelines (1)

1) Jensen et al. 2005

Current DC Regulations

District of Columbia Municipal Regulations for Hospital Personnel and Operations Title 22, Chapter B20, Section 17

2017.1 Each person, other than a physician, involved in the performance of duties involving direct patient care shall have an occupational health screening by a physician or other qualified health professional within thirty (30) calendar days prior to entering active status or within thirty (30) calendar days after entering, and at least once every two (2) years thereafter. Each physician shall have a health examination performed by another physician or other qualified health care professional at the time of appointment and once every two (2) years thereafter.

2017.2 Each health screening shall include a medical history, physical examination, intradermal tuberculin test and any indicated laboratory work, except that the intradermal tuberculin test and subsequent tests shall be performed in accordance with section 2017.3.

2017.3 Preventative measures, testing and frequency of testing for tuberculosis shall be in accordance with standards and guidelines developed by the Centers for Disease Control and Prevention.

...

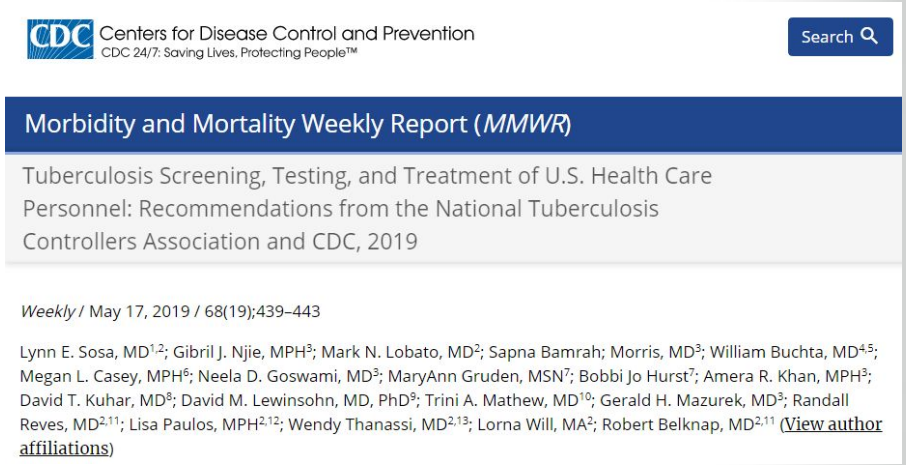
2017.6 In lieu of the pre-employment intradermal tuberculin test required by this subsection, the examining physician may accept a written report of the test or x-ray made by a qualified person within twelve (12) months prior to the date of the examination.

New CDC Guidelines

Sosa et al. 2019 (1) MMWR, May 17th, 2019

Available online at:

http://dx.doi.org/10.15585/mmwr.mm6819a3



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Morbidity and Mortality Weekly Report (*MMWR*)

Tuberculosis Screening, Testing, and Treatment of U.S. Health Care Personnel: Recommendations from the National Tuberculosis Controllers Association and CDC, 2019

Weekly / May 17, 2019 / 68(19);439–443

Lynn E. Sosa, MD[1,2]; Gibril J. Njie, MPH[3]; Mark N. Lobato, MD[2]; Sapna Bamrah; Morris, MD[3]; William Buchta, MD[4,5]; Megan L. Casey, MPH[6]; Neela D. Goswami, MD[3]; MaryAnn Gruden, MSN[7]; Bobbi Jo Hurst[7]; Amera R. Khan, MPH[3]; David T. Kuhar, MD[8]; David M. Lewinsohn, MD, PhD[9]; Trini A. Mathew, MD[10]; Gerald H. Mazurek, MD[3]; Randall Reves, MD[2,11]; Lisa Paulos, MPH[2,12]; Wendy Thanassi, MD[2,13]; Lorna Will, MA[2]; Robert Belknap, MD[2,11] (View author affiliations)

	2005 Recommendation	2019 Recommendation
Baseline (preplacement) screening and testing	TB screening of all HCP, including a symptom evaluation and test (IGRA or TST) for those without documented prior TB disease or LTBI.	TB screening of all HCP, including a symptom evaluation and test (IGRA or TST) for those without documented prior TB disease or LTBI **(unchanged)**; **individual TB risk assessment (new).**
Postexposure screening and testing	Symptom evaluation for all HCP when an exposure is recognized. For HCP with a baseline negative TB test and no prior TB disease or LTBI, perform a test (IGRA or TST) when the exposure is identified. If that test is negative, do another test 8–10 weeks after the last exposure.	**Unchanged**
Serial screening and testing for HCP without LTBI	According to health care facility and setting risk assessment. Not recommended for HCP working in low-risk health care settings. Recommended for HCP working in medium-risk health care settings and settings with potential ongoing transmission.	**Not routinely recommended (new)**; can consider for selected HCP groups **(unchanged)**; recommend annual TB education for all HCP **(unchanged)**, including information about TB exposure risks for all HCP **(new emphasis).**
Evaluation and treatment of positive test results	**Referral to determine whether LTBI treatment is indicated.**	**Treatment is encouraged for all HCP with untreated LTBI, unless medically contraindicated (new).**

Pre-placement Screening

Three parts are recommended: RISK ASSESSMENT, SYMPTOM SCREENING, AND TB TESTING

- **Risk Assessment**
  - Allows for interpretation of TB testing results
  - Determines risk for progression, urgency of LTBI treatment
- **Symptom Screening**
  - Allows for identification of active TB disease
- **TB Testing**
  - Establishes baseline in case of exposure
  - Allows detection of LTBI / TB disease
  - Reduces worksite risk

Pre-placement - Risk Assessment

Recommended for all HCP prior to starting

INCREASED RISK if YES to ANY of the following:

- Temporary or permanent **residence** (for ≥1 month) in a **country** with a **high TB rate**
  - Any country other than Australia, Canada, New Zealand, the United States, and those in western or northern Europe)
- Current or planned **immunosuppression**
  - HIV, organ transplant, treatment with TNF-alpha antagonist, steroids (equivalent of prednisone ≥15 mg/day for ≥1 month), or other immunosuppressive medication
- **Close contact** with **someone** who has had **infectious TB** disease since the last TB test

Pre-placement - Symptom Screen

Positive if YES to ANY of the following (1):

- Cough lasting more than 2 weeks
- Coughing up blood (hemoptysis)
- Unintentional weight loss
- Night sweats
- Persistent fever (over 100 degrees)

Can add questions regarding fatigue, loss of appetite, chest pain, recurrent pneumonia, chest pain

Four symptom screen (2):

- Non-PLWH: Sensitivity: 89.5% Specificity: 28.1%
- PLWH: Sensitivity: 51.0% Specificity: 70.7%

1) WHO, 2) Hamada 2018

Pre-placement - Additional Questions

- Previous history of positive test (TST or IGRA)
- Previous history of treatment for active tuberculosis or latent tuberculosis
- Vaccination with the BCG vaccine

Pre-placement: TB Testing

Low Risk

IGRA (TSpot / Quantiferon) **preferred**

- TST option if *"too costly or too burdensome"* (1)
- If positive, recommended to repeat test (either IGRA or TST)
  - If negative, then negative result

High Risk

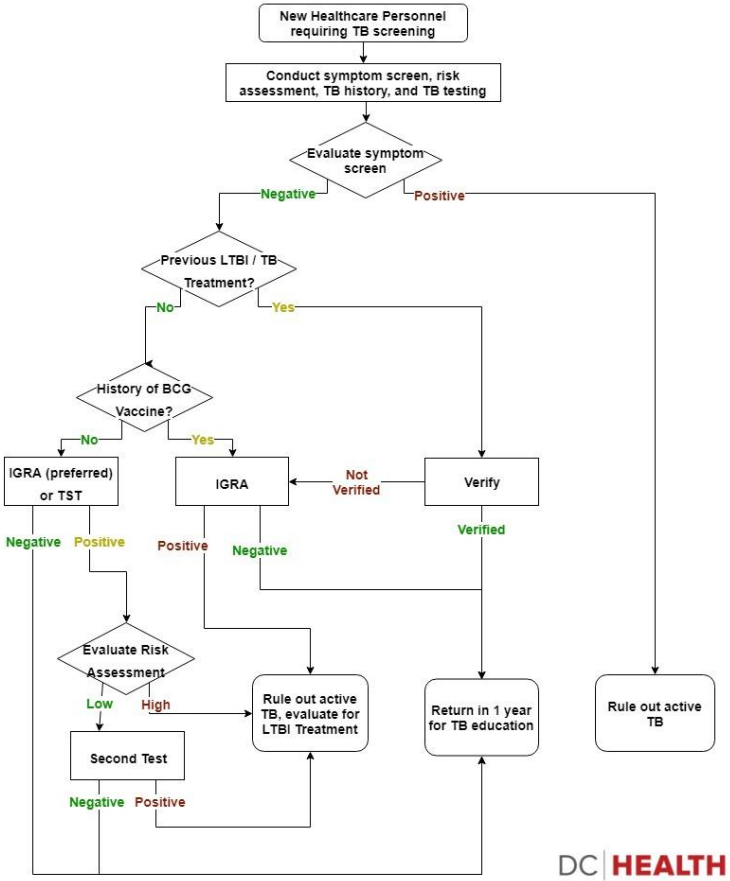
- IGRA (TSpot / Quantiferon) **preferred**
- If positive, no secondary test

If previous history of LTBI / TB treatment

- Confirmation of treatment

1) IDSA/ATS 2017

Healthcare Personnel Pre-placement TB Screening
Sample Algorithm



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For questions, please call the DC TB Control Division at the Health and Wellness Center at 202-698-4040 or 202-741-7692

Positive Test Results

Newly Positive Results

- Symptom assessment
- Chest radiograph
  - **Repeat** chest radiograph is **not required** unless **new symptoms** or starting LTBI treatment
- **Notify the DC TB Control if active disease is suspected**
- Discuss and document risks and benefits of LTBI treatment annually

Established Positive

- Symptom assessment
  - Repeat annually
- Documented chest radiograph
- Discuss and document risks and benefits of LTBI treatment annually

Risks and benefits of LTBI treatment

Risks of disease

- Need to determine patient specific risks of progression to active TB
- www.tstin3d.com - inputs include tests, age, country of origin, other factors
  - Provides PPV of positive test, annual risk of disease progression, lifetime risk, risks of tx
  - **Treatment reduces risk of progression by 90%**
  - **Active TB** even when treated results in **reduced life-expectancy**
  - Cost per TB case: $17,000 direct cost, $44,000 / indirect cost

Risks of treatment

- Hepatotoxicity of INH age associated (>5% if >65)
  - Lower rates associated with new regimens (12)
  - Peripheral neuropathy in those not taking pyridoxine (B6) / nutritional deficiencies

LTBI Treatment

Three Options:

9H: Isoniazid 300 mg daily + Vitamin B6 25-50 mg daily for **nine months**

- **270 doses**, highest risk of hepatotoxicity

4R: Rifampin 600 mg daily for **four months**

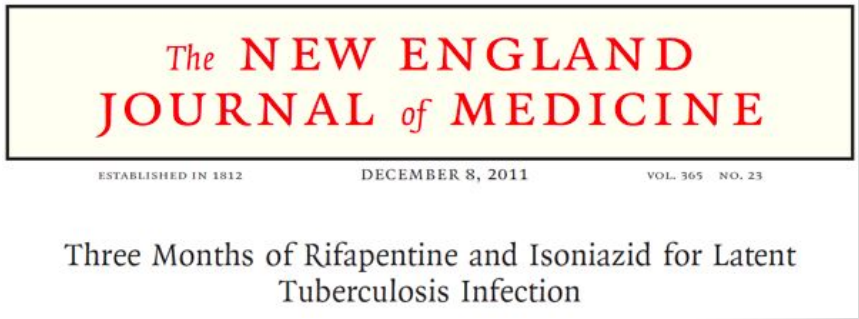
- 120 doses

3HP: Rifapentine 900 mg + Isoniazid 900 mg **weekly for three months (weight based if below 50kg)**

- **12 doses,** flu-like hypersensitivity reaction (2.2%)

3HP vs. 9H

Sterling et al. 2011	**3HP (n=3,986)**	**9H (n=3,745)**
Effectiveness	1.9 per 1,000	4.3 per 1,000 (non-inferior)
Completion	82.1%	69.0% (p<0.01)
Hepatotox.	0.4%	2.7% (p<0.01)



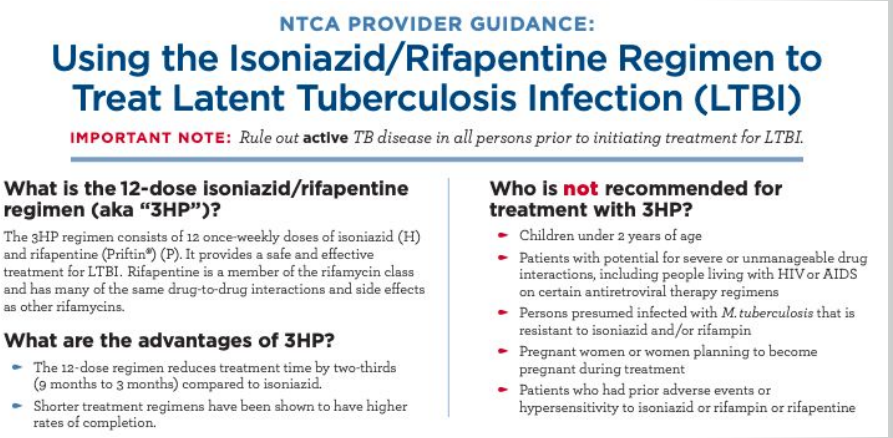
- For children >2 years old noted to be 3HP non-inferior to 9H (13)
- For HIV, 3HP non-inferior to 9H, but must determine interactions
- Self-administration of 3HP was non-inferior to DOT but lower overall rates (84% vs. 76%)

Assistance for Providers

[NTCA 3HP Provider handout]

Review of dosing guidelines, common issues regarding 3HP

- Consultation with DC TB Control if questions



NTCA PROVIDER GUIDANCE:

Using the Isoniazid/Rifapentine Regimen to Treat Latent Tuberculosis Infection (LTBI)

IMPORTANT NOTE: *Rule out* **active** *TB disease in all persons prior to initiating treatment for LTBI.*

What is the 12-dose isoniazid/rifapentine regimen (aka "3HP")?

The 3HP regimen consists of 12 once-weekly doses of isoniazid (H) and rifapentine (Priftin®) (P). It provides a safe and effective treatment for LTBI. Rifapentine is a member of the rifamycin class and has many of the same drug-to-drug interactions and side effects as other rifamycins.

What are the advantages of 3HP?

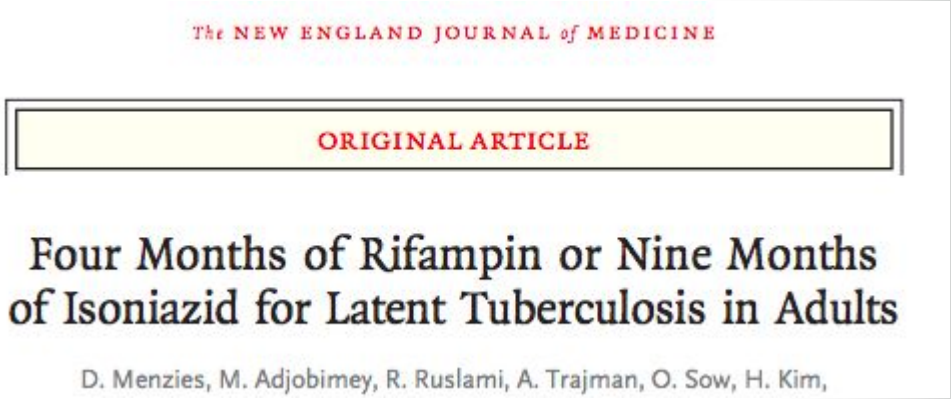
- The 12-dose regimen reduces treatment time by two-thirds (9 months to 3 months) compared to isoniazid.
- Shorter treatment regimens have been shown to have higher rates of completion.

Who is not recommended for treatment with 3HP?

- Children under 2 years of age
- Patients with potential for severe or unmanageable drug interactions, including people living with HIV or AIDS on certain antiretroviral therapy regimens
- Persons presumed infected with *M. tuberculosis* that is resistant to isoniazid and/or rifampin
- Pregnant women or women planning to become pregnant during treatment
- Patients who had prior adverse events or hypersensitivity to isoniazid or rifampin or rifapentine

4R vs. 9H

Menzies et al. 2018	**4R (n=3,2023)**	**9H (n=2,989)**
Effectiveness	4 active cases / 7732 PY	4 active cases / 7652 PY (non-inferior)
Completion	78.8%	63.2% (p<0.01)
Hepatotox.	1.2%	3.0% (p<0.01)



- 4R non-inferior to 9H with higher completion rate, lower rates of serious adverse events
- Self-administration possible with 4R, recommend monthly visits to determine adherence and side-effects

Serial Evaluation

HCP ***without LTBI***, ***without additional risk*** of exposure, serial TB testing is **not routinely recommended**

HCP **should undergo**:

- Annual TB education including risk factors, signs, and symptoms

HOWEVER

HCP with **increased occupational risk of TB may undergo annual TB testing at the discretion of the employer**

- *Ex. respiratory therapists, pulmonologists, TB / ID clinic HCP*

Postexposure Screening and Testing

To occur if a **HCP** is **in contact** with a **person** with potentially **infectious TB disease**

- **Without** use of personal protection

Recommendations

- Symptom evaluation
- **If baseline negative** - TB testing - **IGRA or TST**
  - **If negative -** repeat in 8 to 10 weeks using same type of test
- **If baseline positive** - **no repeat testing**
  - Further evaluation if concern for TB disease

Coordination with DC TB Control

TB reporting is **mandatory** for all cases of active or suspected TB within 72 hours

Online case report form:

https://dchealth.dc.gov/publication/hahsta-notifiable-disease-report-form

TB Control in DC:

- TB Controller: Adam Visconti: 202-770-9983
- Chest Clinic: 202-698-4040
  - New location: 77 P St. NE
- OUR SERVICES (MEDS, CONSULTATION) ARE FREE

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