Wisconsin Department of Health Services
Division of Public Health
P-01928 (Rev 08/2017)

Communicable Disease Case Reporting and Investigation Protocol

TUBERCULOSIS (TB)

I. IDENTIFICATION AND DEFINITION OF CASES

Clinical Description: A bacterial disease caused by organisms in the *Mycobacterium tuberculosis* complex (*M. tuberculosis*, *M. bovis*, *M. africanum, M. canettii*, *M. microti*, *M. caprae and M. pinnipedii*). There are two forms of TB, latent and active (pulmonary and/or extrapulmonary).

Latent TB infection can be established following exposure to an infectious patient expelling aerosolized particles containing viable bacilli. Initial infection generally causes no outward clinical manifestations and is called latent TB. It is characterized by microscopic lesions in the lungs that commonly heal, leaving no residual changes other than occasional small pulmonary or tracheobronchial lymph node calcifications.

Active TB disease can develop following infection and is facilitated by certain risk factors. It can be pulmonary and/or extrapulmonary. Active pulmonary TB may arise from reactivation of a latent focus originating from the initial subclinical infection or from reinfection. Extrapulmonary TB occurs in 15%-30% of cases and may affect any organ or tissue as follows: lymph nodes (33%), pleura (20%), genitourinary tract (5%-10%), bones and joints (5%-10%), meninges (5%), gastrointestinal tract and peritoneum (3.5%), and pericardium (2%-3%).

Cough, fever, fatigue, night sweats, and weight loss are common symptoms associated with pulmonary TB. In most cases, cough is initially nonproductive and later accompanied by purulent sputum. Symptoms such as hemoptysis and hoarseness associated with laryngeal TB are sometimes prominent in advanced stages. Chest radiography (CXR) reveals pulmonary infiltrates and cavitations in the upper segments of the lung lobes. In prolonged disease, fibrotic changes with volume loss are seen.

A. **Laboratory Criteria:**
Confirmatory laboratory evidence:
- Isolation of *M. tuberculosis* in culture from a clinical specimen, **OR**
- Detection of *M. tuberculosis* complex from a clinical specimen by nucleic acid amplification test.

B. **Wisconsin Surveillance Case Definition:**
- **Suspected:** An illness marked by symptoms and laboratory tests that may be indicative of tuberculosis, such as a prolonged cough, prolonged fever, hemoptysis, compatible radiographic findings or other appropriate medical imaging findings, with laboratory and diagnostic evaluations not complete.
- **Confirmed**: A case that meets the clinical case definition in the absence of laboratory confirmation (see clinical criteria for reporting, below) **OR** is laboratory-confirmed.

II. REPORTING

A. **Wisconsin Notifiable Disease Category I – Methods for Reporting:** This disease shall be reported **IMMEDIATELY BY TELEPHONE** to the patient's local health officer or to the local health officer's designee upon identification of a case or suspected case, per Wis. Admin. Code § DHS 145.04 (3) (a). In addition to the immediate report, complete and fax, mail or electronically report an Acute and Communicable Disease Case Report (DHS F-44151) to the address on the form, or enter the data into the Wisconsin Electronic Disease Surveillance System (WEDSS), within 24 hours.

B. **Responsibility for Reporting**: According to Wis. Admin. Code § DHS 145.04(1), persons licensed under Wis. Stat. ch. 441 or 448, laboratories, health care facilities, teachers, principals, or nurses serving a school or day care center, and any person who knows or suspects that a person has a communicable disease identified in Appendix A.

C. **Clinical Criteria for Reporting**: If there is no positive culture or nucleic acid amplification test to confirm TB, a person may be considered to have clinical TB. A clinical case must meet the following criteria:

- Treatment for TB disease with two or more medications, and improvement in signs and/or symptoms after at least two months of treatment.
- Completed diagnostic evaluation.
- Signs and symptoms compatible with tuberculosis (TB) (*e.g.*, abnormal chest radiograph, abnormal chest computerized tomography scan or other chest imaging study, clinical evidence of current disease or high suspicion) and any combination of the following criteria:
  - A positive tuberculin skin test or positive interferon gamma release assay for *M. tuberculosis.*
  - Risk factors as below:
    - Birth in a country having a high TB prevalence/incidence.
    - Exposure to a known case of tuberculosis.
    - Age ≤ 5 years and exposure to a known case of tuberculosis.
    - History of previous complete or partial treatment for tuberculosis.
    - HIV infection.
    - Children or adolescents with parents born in a country with a high prevalence of TB cases.
    - Locally defined, high-risk groups with any of the following socioeconomic predictors: low income, inner-city residence, migrant labor, drug and/or alcohol abuse, homeless.
    - Immunosuppressive therapy (including immunomodulators for arthritis, Crohn's, or other autoimmune disease).
    - Chronic renal failure.
    - Hematologic disorders such as leukemia or lymphoma.
    - Malignant neoplasms such as carcinoma of the head or neck.
    - Residency or occupation in high-risk congregate settings.
    - Gastrectomy or jejunoileal bypass.
    - Fibrotic changes or "old healed TB" on CXR.
    - Diabetes mellitus.
    - Pulmonary silicosis.
    - Unexplained ≥ 10% ideal weight loss.

D. **Laboratory Criteria for Reporting:**
- Isolation of *M. tuberculosis* in culture from a clinical specimen, **OR**
- Detection of *M. tuberculosis* complex from a clinical specimen by nucleic acid amplification test.

III. CASE INVESTIGATION

A. **Responsibility for case investigation**: It is the responsibility of the local health department (LHD) to investigate or arrange for investigation of suspected or confirmed cases as soon as is reasonably possible. A case investigation may include information collected by phone, in person, in writing, or through review of medical records or communicable disease report forms, as necessary and appropriate.

B. **Required Documentation:**
1. Enter case investigation information into WEDSS.
2. Complete a Centers for Disease Control and Prevention (CDC) Report of Verified Case of Tuberculosis (RVCT) form. The RVCT form will be completed by the Wisconsin Tuberculosis Program and uploaded to the WEDSS disease incident filing cabinet.

C. **Additional Investigation Responsibilities:** If requesting state-funded medication, fill out the Antituberculosis Therapy Program Initial Request for Medication (F-44000).

IV. PUBLIC HEALTH INTERVENTIONS AND PREVENTION MEASURES

A. In accordance with Wis. Admin. Code § DHS 145.05, local public health agencies should follow the methods of control recommended in the current editions of *Control of Communicable Diseases Manual*, edited by David L. Heymann, published by the American Public Health Association, and the American Academy of Pediatrics' *Red Book: Report of the Committee on Infectious Diseases*, unless otherwise specified by the state epidemiologist.

B. Protocol for Disease Management and Investigation of Contacts

- For patients with pulmonary, pleural, and laryngeal tuberculosis, control of infectivity is best achieved by prompt specific drug therapy. Collection of three sputum samples, either by spontaneous production or induction, is required.
- Persons with extrapulmonary TB should receive a complete medical examination and provide three sputum samples for testing to assure that the TB is not disseminated to other parts of the body and/or to the lungs or larynx (which would make them infectious). Pulmonary symptoms are not required for pulmonary TB to be present.
- Patients with pulmonary, pleural, or laryngeal TB must remain isolated (at home or in an airborne isolation room designated for TB patients) until three consecutive smears are *negative* for AFB from sputum specimens, each collected at least eight (8) hours apart; **AND** the patient has been on appropriate therapy for at least two weeks; **AND** there is evidence of clinical improvement, **OR** another cause for the signs and symptoms has been identified.
- If three AFB smear *positive* sputum specimens are tested, and there are TWO negative nucleic acid amplification test results, **AND** the patient is asymptomatic, the patient may be released from isolation as minimally infectious. Such a person may, however, still have active TB, and the case may not be closed until final culture results are available and negative for *M. tuberculosis* complex. The decision to release the patient from isolation must be balanced by the potential need for a more extensive contact investigation should the patient have pulmonary TB.
- Multiple-Drug Resistant (MDR) pulmonary or laryngeal cases must remain in isolation until three consecutive **cultures** (not smears) are negative for MTB from sputum specimens collected on different days.

C. Investigation of Contacts and Identification of the Source of Infection

Initial interferon gamma release assay or tuberculin skin testing of all household members and other close contacts, with repeat testing of those with negative tests 90 days post-exposure.

D. Prevention Measures

- Prevention of the spread of tuberculosis is achieved by:
  - Rapid recognition of TB disease.
  - Isolation of the person with TB disease until no longer infectious, as proven by sputum smears and cultures.
  - Appropriate, completed, and directly observed therapy of the person with TB disease.
  - Timely, complete, and appropriate treatment for those exposed to the person with active disease, including:
    - Directly observed preventive therapy of all children and immunosuppressed persons in contact with the person with confirmed or suspect TB disease. This therapy should begin IMMEDIATELY UPON IDENTIFICATION of these persons as contacts, and should continue as the contacts are tested for active disease, and until final testing is complete and negative, 10–12 weeks after the last exposure to the infectious person.
    - Identification and testing of as many high- and medium-priority contacts as can be identified.
    - Appropriate and completed treatment of any contacts who are identified as having TB infection, but ONLY after they have been shown not to have active TB disease, as determined by:
      - ✓ Chest X-ray, and
      - ✓ Medical evaluation, and
      - ✓ In the event of any respiratory symptoms OR abnormal chest X-ray results, smear and culture of three respiratory specimens. Collect a series of three sputum specimens, 8-24 hours apart, with at least one being an early morning specimen.

- No single intervention is sufficient to control the spread of tuberculosis; a coordinated approach and usually more than one person are necessary. Please consult the state TB Program when you have a person with confirmed or suspected TB.

V. CONTACTS FOR CONSULTATION

A. Local health departments and tribal health agencies: https://www.dhs.wisconsin.gov/lh-depts/index.htm

B. Bureau of Communicable Diseases, Wisconsin Tuberculosis Program: 608-261-6319.

C. Wisconsin State Laboratory of Hygiene: 1-800-862-1013

VI. RELATED REFERENCES

A. Heymann DL, ed. Tuberculosis. In: *Control of Communicable Diseases Manual*. 20th ed. Washington, DC: American Public Health Association, 2015: 637-648.

B. Pickering LK, ed. Tuberculosis. In: *Red Book*: *2015 Report of the Committee on Infectious Diseases*. 30th ed. Elk Grove Village, IL: American Academy of Pediatrics, 2015: 805-831.

C. Centers for Disease Control and Prevention website: https://www.cdc.gov/tb/default.htm

D. Additional References:

- Lewinsohn, D. et al. Official American Thoracic Society/Infectious Diseases Society of America/Centers for Disease Control and Prevention Clinical Practice Guidelines: Diagnosis of Tuberculosis in Adults and Children. *Clin Infect Dis* 2017; 64 (2): 111-115.
- Seaworth BJ, Griffith DE. 2017. Therapy of multidrug resistant and extensively drug-resistant tuberculosis. Microbiol Spectrum 5(2):TNMI7-0042-2017.
- Centers for Disease Control and Prevention. *Guidelines for Preventing the Transmission of Mycobacterium tuberculosis in Health-Care Settings*. 2005. MMWR 54(No. RR-17). http://www.cdc.gov/mmwr/pdf/rr/rr5417.pdf
- Centers for Disease Control and Prevention. *Guidelines for the Investigation of Contacts of Persons with Infectious Tuberculosis: Recommendations from the National Tuberculosis Controllers Association and CDC.* 2005. MMWR 54 (No. RR-15, 1-37). http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5415a1.htm
- Centers for Disease Control and Prevention. *Controlling Tuberculosis in the United States.* Recommendations from the American Thoracic Society, CDC and the Infectious Diseases Society of America. 2005. MMWR 54 (No. RR-12).
- National Tuberculosis Controller Association and National Tuberculosis Nurse Coalition. *Tuberculosis Nursing: A comprehensive guide to patient care*. 2nd ed. 2011. http://tbcontrollers.org/docs/NursesManual/TBNursingManual06132011.pdf ; user name "manual," password "2publish."
- Centers for Disease Control and Prevention. *Core Curriculum on Tuberculosis: What the clinician should know*. 2011. http://www.cdc.gov/tb/education/corecurr/index.htm
- Centers for Disease Control and Prevention. *Targeted Tuberculin Testing and Treatment of Latent Tuberculosis Infection.* 2000. *MMWR* 2000; 49 (No. RR-6). http://www.cdc.gov/mmwr/preview/mmwrhtml/rr4906a1.htm
- Centers for Disease Control and Prevention. *Updated Guidelines for Using Interferon Gamma Release Assays to Detect* Mycobacterium tuberculosis *Infection — United States, 2010*. *MMWR* 59 (RR-5); 1-25. http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5905a1.htm?s_cid=rr5905a1_e
- Centers for Disease Control and Prevention. Updated Guidelines for the Use of Nucleic Acid Amplification Tests in the Diagnosis of Tuberculosis. 2009. *MMWR* 58 (01); 7-10 http://www.cdc.gov/mmwr/preview/mmwrhtml/mm5801a3.htm?s_cid=mm5801a3_e