

## ***Mycobacterium tuberculosis* testing at the Vermont Department of Health Laboratory**

Tuberculosis (TB) continues to be a significant health concern in the United States and in Vermont. Between 2005 and 2009, 32 cases of active TB disease were identified in Vermont. Eighteen (56.3%) individuals had pulmonary TB. Active TB is a reportable disease. Contact the Vermont Department of Health (VDH) TB Program at 802-863-7240 or 800-640-4373 when active TB disease is suspected. TB Program staff can advise regarding public health concerns and can facilitate testing at the VDH Laboratory to rule in or rule out TB.

The VDH Mycobacteriology Laboratory identifies *Mycobacterium tuberculosis*, the causative agent of tuberculosis (TB) and other clinically significant *Mycobacterium* species with a combination of culture, molecular-based assays, and biochemical testing. Both pulmonary and non-pulmonary specimens are accepted for culture. The mycobacteriology lab also performs mycology testing. TB testing services include:

**Amplified *Mycobacterium tuberculosis* Direct (MTD) Test:** This is a nucleic acid amplification test (NAAT) for the diagnosis of tuberculosis. The MTD determines rapidly (in <1 day) whether a smear-positive respiratory specimen contains *M. tuberculosis* complex RNA. All first time smear-positive respiratory specimens are tested. Providers may also request the MTD test if TB pulmonary disease is suspected based on clinical evaluation because the MTD is approved for both smear-positive and smear-negative respiratory specimens. STAT testing outside of standard laboratory hours can be arranged by contacting the VDH Epidemiology Section at 802-863-7240 or 800-640-4373.

The CDC recommends NAA testing if the test result will alter case management or TB control activities. The 2009 release “Updated Guidelines for the Use of Nucleic Acid Amplification Tests in the Diagnosis of Tuberculosis” discusses the role of NAA test results in deciding initiation of therapy, decisions regarding respiratory isolation and ending non-indicated TB treatment.

**Microscopy, Culture and Identification:** AFB microscopy is performed on all specimens except urine specimens. Fluorochrome staining is performed. Results are reported via fax within 24 hours of specimen arrival (except weekends). All specimens are routinely cultured to Lowenstein Jensen medium and a rapid liquid culture medium.

DNA probe testing permits rapid identification of *M. tuberculosis* complex, *M. avium* complex, *M. kansasii*, and *M. goodii*. DNA probes are also sensitive and specific and can be performed from growth in liquid as well as from solid media. Traditional biochemical testing is performed for organisms not identified by DNA probe. When biochemical testing results are inconclusive, isolates are referred to the Diagnostic Mycobacteriology Laboratory at National Jewish Health for further analysis.

**Primary Drug Susceptibility Testing and Genotyping:** The laboratory provides primary drug testing (isoniazid, rifampin, ethambutol and pyrazinamide) for all initial *M. tuberculosis* complex isolates. Isoniazid and ethambutol are tested at a low level and a high level concentration. All *M. tuberculosis* complex isolates are forwarded to the designated CDC contract laboratory for genotyping. Genotyping can be a critical tool for contact investigation, outbreak investigation and monitoring of genotype clusters to prevent transmission.

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The *Infectious Disease Bulletin* can be viewed at:

<http://healthvermont.gov/pubs/IDB/index.aspx>

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