

**Minnesota Disease Prevention and Control Omaha User's Group**  
**3/4/13**

**Problem: Communicable/Infectious Condition – Pathway LTBI**

| <b>Category</b> | <b>Target</b>          | <b>Care Description Note</b>                                    | <b>Evidence -based Practice Recommendations</b>   |
|-----------------|------------------------|---|---|
| TGC             | Anatomy and Physiology | Disease Process   | <p>Latent tuberculosis infection (LTBI) is “the presence of <i>M. Tuberculosis</i> organisms without symptoms or radiographic or bacteriologic evidence of TB disease” (CDC, 2011). While approximately 90-95% of people infected start an immune response that stops the progression of LTBI to TB, certain individuals are at especially high risk for progression to TB disease (CDC, 2011).</p> <p>Diagnosis of LTBI is based upon: medical history information; Tuberculin Skin Test (TST) or Interferon Gamma Release Assay (IGRA) results, physical examination, chest radiograph and in certain situations, sputum examinations. Presence of TB must be excluded before treatment of LTBI is started (CDC, 2010)</p>  |
| TGC             | Screening procedures   | Interpretation of TST and x-rays, interpretation of blood tests | <p>Targeted tuberculin testing for LTBI is an important component of TB control. This identifies persons at high risk for developing TB who would benefit from treatment of LTBI, if detected (MDH, 2003)</p> <p>Reading and interpretation of TST reactions should be conducted within 48-72 hours by a trained health care professional (CDC, 2010)</p> <p><b>Classification of TST reactions:</b><br/> <b>A TST of <math>\geq 5</math>mm of induration is considered positive in:</b></p> <ul style="list-style-type: none"> <li>• HIV infected persons</li> <li>• Recent contacts of a person with infectious TB disease</li> <li>• Persons with fibrotic changes on chest radiograph consistent with prior TB</li> </ul> |

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|  |  |  | <ul style="list-style-type: none"> <li>• Organ transplant recipients</li> <li>• Persons immunosuppressed for other reasons (e.g. taking equivalent of <math>\geq 15</math>mg/day of prednisone for 1 month or more)</li> </ul> <p><b>A TST of <math>\geq 10</math> mm of induration is considered positive in:</b></p> <ul style="list-style-type: none"> <li>• Recent immigrants (within past 5 years) from high-prevalence countries</li> <li>• Injection drug users</li> <li>• Residents or employees of high-risk congregate settings (e.g. jails, homeless shelters)</li> <li>• Mycobacteriology laboratory personnel</li> <li>• Persons with clinical conditions such as diabetes mellitus, chronic renal failure, etc</li> <li>• Children younger than 4 years of age</li> <li>• Infants, children or adolescents exposed to adults at high risk for TB disease</li> </ul> <p>A TST of <math>\geq 15</math> mm of induration is considered positive in</p> <ul style="list-style-type: none"> <li>• Persons with no known risk factors for TB</li> </ul> <p>(CDC, 2010)</p> <p><b>Chest X-rays</b></p> <p>To help differentiate between LTBI and pulmonary TB disease in individuals with positive test for TB infection, chest x-rays are used.</p> <p>The following guidelines are recommended:</p> <ul style="list-style-type: none"> <li>• A chest x-ray should be ordered as part of the evaluation for a person who has a positive TST or IGRA result</li> <li>• A chest x-ray is also recommended with absence of a positive test result for TB infection when the person is a close contact of an infectious TB client starting LTBI treatment (e.g. a young child, someone immunocompromised)</li> <li>• Periodic follow-up with x-rays are not indicated regardless if treatment is complete unless it is an unusual circumstance</li> </ul> <p>(CDC, 2010)</p> |
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|     |                              |  | <p><b>IGRAs</b><br/>Blood tests used to measure one’s immunity reactivity to specific mycobacterial antigens.</p> <p><b>Interpretation of IGRA results:</b><br/><b>QuantiFERON-TB Gold:</b> results reported as positive, negative, indeterminate<br/><b>QuantiFERON-TB Gold In-Tube:</b> results reported as positive, negative, indeterminate<br/><b>T-SPOT. TB:</b> positive, negative, indeterminate, borderline<br/>Lab should provide both quantitative and qualitative results (CDC, 2010)</p>   |
| TGC | Signs and Symptoms: Physical | Completion of treatment instructions (includes symptom recognition, decline future TSTs) | Upon completion of treatment/discharge educate clients on the signs and symptoms of TB disease (weight loss, night sweats, prolonged cough, bloody sputum), and advise clients to contact their medical provider if they develop any of these symptoms (CDC, 2010; MDH, 2012)   |
| TX  | Specimen collection          | Blood, other<br>Order appropriate labs (for facilities w/in-house lab)                   | <p>Baseline lab testing not routinely necessary</p> <p>At the start of LTBI treatment, lab testing is recommended for clients with the following factors:</p> <ul style="list-style-type: none"> <li>• History of liver disease</li> <li>• Liver disorders</li> <li>• Risks for chronic liver disease</li> <li>• Use of alcohol regularly</li> <li>• HIV infection</li> <li>• Pregnancy or immediate postpartum period (e.g. within 3 mos of delivery)</li> </ul> <p>Following baseline testing, periodic, routine testing is recommended for those with abnormal initial results and other clients at risk for hepatic disease (CDC, 2010)</p> |

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| CM | Community outreach worker services | supervise   | <p>“An RN may delegate to and supervise LPNs and unlicensed assistive personnel (UAP)”(Minnesota Board of Nursing, 2010)</p> <p><i>“RNs must be aware of their responsibilities in delegation and supervision. They also should take into account the many and varied factors that must be considered in determining whether or not to delegate and if the RN does decide to delegate, which provisions should be in place to ensure the delegation is appropriate and safe for the client.</i></p> <ul style="list-style-type: none"> <li>• <i>The definition of supervision does not specify whether the supervision is provided directly or indirectly. An RN may, based on professional judgment, determine whether RN presence in the care setting is necessary or if being available for consultation is sufficient.</i></li> <li>• <i>Each nurse is accountable for his or her actions when supervising or monitoring other personnel “(Minnesota Board of Nursing, 2010).</i></li> </ul> |
| CM | Continuity of Care                 | Coordination among providers<br>Schedule/provide services | Ensure communication of information among the client’s providers and other organizations in order to provide safe and effective care and avoid duplication of services (Martin, 2005)  |
| S  | Signs and Symptoms - Physical      | Evidence of disease/infection<br>Monitor weight           | <p><b>LTBI:</b></p> <ul style="list-style-type: none"> <li>• Lack of physical findings or symptoms indicating TB disease</li> <li>• Positive TST or IGRA result</li> <li>• Chest c-ray normal</li> <li>• Respiratory specimens clear; culture negative</li> <li>• Due to auto-immune suppression, respiratory specimens may be abnormal (CDC, 2010)</li> <li>• Monitor weight as indicated</li> </ul> <p><b>TB Disease</b></p> <ul style="list-style-type: none"> <li>• Symptoms may include one or more of the following: cough, chest pain, fever, weight loss, night sweats, fatigue, hemoptysis, and decreased appetite</li> </ul>   |

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|  |  |  | <ul style="list-style-type: none"> <li>• TST or IGRA usually abnormal. However, clients with advanced immunosuppression or extrapulmonary disease may exhibit normal results</li> <li>• Respiratory specimens are often smear or culture positive. However, these could be negative for clients with extrapulmonary disease or early/minimal pulmonary disease (CDC, 2010)</li> </ul> |
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**Problem: Medication regimen – LTBI Pathway**

| Category | Target                         | Care Description Note  | Evidence-based Practice Recommendations  |
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| TGC      | Medication Action/Side Effects | Important to Take as Prescribed<br>Purposes/benefits<br>Changes to note and report in a timely manner<br>Need for timely lab tests/results | <p><b>Medication teaching includes:</b></p> <ul style="list-style-type: none"> <li>• Explain disease process and rationale for medication with absence of symptoms or x-ray abnormalities</li> <li>• Urge importance of completing regimen to help prevent progression to active TB</li> <li>• Notify PHN or MD if side effects occur</li> <li>• Review signs/symptoms of active TB</li> <li>• Discuss management of common side effects</li> <li>• Avoid alcohol use</li> <li>• Caution regarding effect on hormonal contraceptives</li> <li>• Avoid pregnancy</li> <li>• Stress importance of notification to providers if moving</li> <li>• Monthly follow-up with health care provider</li> </ul> <p>(MDH, 2012)</p> |
| TX       | Medication administration      | Directly observed therapy – 12 week regimen<br>(Hook to DOT side effects form in PH-Doc)   | In 2011, CDC issued recommendations in which INH and Rifapentine (INH-RPT 1x wkly x 12 wks administered by Directly Observed Therapy (DOT) is considered equal to the 9 mo. INH regimen for some clients who meet criteria (MDH, 2012).  |
| S        | Medication administration      | Takes meds as prescribed and recommended   | Regimens:<br>INH 9 mos; INH 6 mos; and Rifampin 4 mos.   |
| TX       | Specimen collection            | Blood  | Reference lab collection guidelines for public health department w/in-   |

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|    |                                  |   | house labs that can order.   |
| CM | Medication Coordination/ordering | Monitor supply<br>Obtain refills in a timely manner<br>Communicate with pharmacist/other providers  | Process for effective case management intervention: <ul style="list-style-type: none"> <li>• Determine the medication resources necessary to maintain an adequate and safe treatment process</li> <li>• Develop a trusting relationship</li> <li>• Work cooperatively with other partners and providers in coordinating the medication services</li> <li>• Provide advocacy to resolve potential or actual barriers to medication administration/coordination (MDH, 2001)</li> <li>• Confer with MDH TB Consultants as necessary (2013)</li> </ul> <a href="http://www.health.state.mn.us/divs/idepc/diseases/tb/medications.html">http://www.health.state.mn.us/divs/idepc/diseases/tb/medications.html</a>   |
| S  | Medication Action/Side effects   | Takes as prescribed – notes and reports changes and side effects in a timely manner;<br>Refill assessment: (Hook to LTBI side effect form in PH-Doc)<br>weekly/monthly nurse assessment for 12 week DOT therapy: (Hook to form in PH-Doc) | Overall recommendations: <ul style="list-style-type: none"> <li>• All clients have follow-up evaluation monthly</li> <li>• Advise clients to stop treatment and seek medical evaluation if serious adverse side effects occur</li> <li>• For those receiving INH-RPT, a monthly PE is required to assess the presence of liver tenderness, jaundice, or rash (MDH, 2012)</li> </ul> Possible side effects which may occur: <ul style="list-style-type: none"> <li>• Poor appetite (INH/RIF/RPT)</li> <li>• Nausea/vomiting (INH/RIF/RPT)</li> <li>• Right Upper Quadrant (RUQ) abdominal tenderness (INH/RIF/RPT)</li> <li>• Tea/coffee colored urine (INH/IRF/RPT)</li> <li>• Unusual fatigue (INH/RIF/RPT)</li> <li>• Dizziness (RPT)</li> <li>• Rash/itching (INH/RIF/RPT)</li> <li>• Yellow eyes/skin (INH/RIF/RPT)</li> <li>• Numbness/tingling in arms/legs (INH)</li> <li>• Fever for 3 days (INH/RIF/RPT)</li> <li>• Joint pain, bloody urine, bruising/bleeding easily (INH/RPT 12 wk) (MDH, 2012)</li> </ul> |
| S  | Laboratory findings              | Liver function  | Measures of serum AST, ALT and bilirubin not routinely necessary.  |

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|  |  |  | <p>Lab testing is recommended @ the start of LTBI therapy for clients with any of the following:</p> <ul style="list-style-type: none"> <li>• Liver Disorders</li> <li>• HX of Liver Disease (Hepatitis B or C, alcoholic hepatitis or cirrhosis)</li> <li>• Risks for chronic liver disease</li> <li>• Regular use of alcohol</li> <li>• HIV infection</li> <li>• Pregnancy or immediate postpartum period (within 3 mos of delivery)</li> </ul> <p>Baseline testing may be considered on an individual basis, particularly for those clients taking other medications for chronic medical conditions. Following baseline testing, routine/periodic is recommended for those with abnormal results and others @ risk for hepatic disease (CDC, 2010)</p> |
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Legend and Definitions:

**TGC – Teaching, Guidance, and Counseling** - Activities designed to provide information and materials, encourage action and responsibility for self-care and coping, and assist the individual, family, or community to make decisions and solve problems. Applicable to a specific problem.

**Tx – Treatment** – technical activities such as specimen collection and medication prescriptions that are designed to prevent, decrease, or alleviate signs and symptoms for the individual, family or community. Applicable to a specific problem.

**CM – Case Management** – activities such as coordination, advocacy, and referral that facilitate service delivery; promote assertiveness; guide the individual, family, and community toward use of appropriate resources; and improve communication among health and human service providers. Applicable to a specific problem.

**S – Surveillance** – activities such as detection, measurement, critical analysis, and monitoring intended to identify the individual, family, or community's status in relation to a given condition or phenomenon. Applicable to a specific problem

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