INTERNATIONAL STUDENT TB SCREENING IN A UNIVERSITY SETTING

James R. Koski, MD, MPH
OSU Student Health Services
Disclosures- None
Pulmonary Tuberculosis
## Latent Tuberculosis Infection vs TB Disease

<table>
<thead>
<tr>
<th>Latent TB Infection (LTBI)</th>
<th>Active TB Disease</th>
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</thead>
<tbody>
<tr>
<td>TB germs are dormant &amp; this phase can last for decades</td>
<td>TB germs are reproducing &amp; spreading, causing tissue damage- pulmonary and extra-pulmonary</td>
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<tr>
<td>Feels well.</td>
<td>Sick and typical TB symptoms include: cough &gt; 3 weeks, weight loss, night sweats or fever.</td>
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<tr>
<td>Chest x-ray is usually normal.</td>
<td>Chest x-ray and other tests are needed.</td>
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<tr>
<td>Not infectious</td>
<td>Infectious if pulmonary or laryngeal</td>
</tr>
<tr>
<td>Treat by taking 1-2 drugs</td>
<td>Treat by taking 3-4 drugs for at least 6 months</td>
</tr>
<tr>
<td>Costs about $600 to treat</td>
<td>Costs about $19,000 to treat</td>
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Oregon State University experience

- 35 years of international student TB screening
- 2012-2015: TB screening suspended
- 2010-2016: 60% of Benton County TB cases were OSU students
- 2016-2019:
  - ~30,000 (~24,000 - main campus) total enrollment
  - ~11.0% (~3,400) international students
  - ~27.0% (~930) international students/year test with IGRA (QFT-G)
  - ~4.7% LTBI positivity rate
OSU TB Screening Team

- Brittney Holcomb, MA, Immunization/TB Compliance Manager
- Mark Hornabrook, MT (ASCP), SBB, MHA, Laboratory Director
  - Leslie Kaye, LMT2, Schedules Follow TB Screening Clinic/Appointments
- Charmaine Abrams, RT(R), X-ray Manager
- Patti Irvine, RN, Nursing Clinical Manager
  - Lynn Ward, RN, Nurse counselor & TB Screening Tracking Coordinator
- Jennifer Davis, PharmD, Director of OSU Pharmacy
  - Jackie Foster, PharmD, Clinical Pharmacist
  - Natasha Malik, PharmD, Pharmacy resident
- James Koski, MD, MPH, OSU TB Physician
Identifying Who Needs Screening

• Students from higher TB endemic countries with WHO TB incidence rate of greater to or equal to 20 cases/100,000.

• Immunization/TB Compliance Manager
  ► Runs a BANNER report with country of origin to identify who need screening.
  ► Informs students that they must report to International Immunization/TB Screening Clinic.
TB screening clinics

• Immunization/TB screening clinic: new student orientation
  ► Immunizations
    • Required: MMR, HepB, Varicella, MCV4, Tdap
  ► TB screening
    • TB screening questionnaire
    • Screening IGRA blood test (QFT-G) if from country of high incidence (20 cases/100,000)

• Follow-up TB screening clinic
  ► 1V chest x-ray and initial LTBI counseling
  ► Referrals: pharmacy >> LTBI treatment or TB physician >> secondary counseling
Non-compliance with screening and counseling = REGISTRATION HOLD

• SHS monitors student compliance with health policies.
• Failure to provide completed health history form, proof of required immunizations or completed TB testing (if required) before pre-registration period for next term's classes: SHS enters code in Student Information System preventing registration.
• Students can monitor holds via Student Online Services > Student Records > View Holds and can call Immunization Helpline (541-737-7573) or come to SHS to find out why they have a hold and how to have it removed.
Utilizing a Tracking Coordinator

• Tracks IGRA + patients through:
  ▶ TB Screening
  ▶ LTBI counseling
  ▶ LTBI treatment

• Tracking coordinator can be:
  ▶ Nursing staff vs. laboratory staff vs. clinical pharmacist

• Track positive patients throughout screening, counseling and treatment.
Tuberculosis of the Knee
Financing the Screening Program

2019 Student Costs

• Mandatory student health fee per term: $171.54
  ▶ Funds student health staffing

• Mandatory health insurance per term: $938.00

• TB screening tests- 20% insurance co-pay
  ▶ IGRA Test: avg. student cost $0.00- covered 100%
  ▶ 1V Chest x-ray: avg. student cost $23.60

• LTBI treatment costs: 20% insurance co-pay
  ▶ 3 month Isoniazid/Priftin (Rifapentine) (3HP/DOT): avg. student cost $60-70
  ▶ 4 month Rifampin (4R): avg. student cost $30-60
  ▶ 9 month Isoniazid (9H): avg. student cost $30
Tuberculosis of Spine: Pott’s Disease
Counseling Tools

• CDC Stop TB poster
• CDC fact sheets: LTBI treatment
• Language-specific handouts and access to language line translators
• BCG World Atlas
• Online TST/IGRA Calculator
  ▶ Risk of Exposure & Risk of Progression

• OSU Mantra: “Decision to test is a decision to treat”
Importance of Repeated Counseling

International Student TB Screening at Oregon State University Student Health Services
Role of Pharmacy

• Counseling regarding LTBI treatment options

• Initiating and monitoring treatment
  ▶ 3HP Directly Observed Therapy (DOT): weekly visits
  ▶ 4R & 9H: monthly visits

• Collaborative care with TB physician
  ▶ Communicate and consult with TB physician on regular basis

• Completion letters and documents
  ▶ Provide completion letter
  ▶ IGRA test result, chest x-ray report, & digital x-ray
Tuberculosis of Adrenal Glands
## Comparison of LTBI treatment regimens

<table>
<thead>
<tr>
<th>Regimen</th>
<th>3HP</th>
<th>4R</th>
<th>9H</th>
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<tbody>
<tr>
<td>Duration</td>
<td>3 month</td>
<td>4 months</td>
<td>9 months</td>
</tr>
<tr>
<td>Dosage</td>
<td>INH 15 mg/kg (900 max) RIF weight based dosing</td>
<td>10mg/kg (600 max.)</td>
<td>5mg/kg (300 max)</td>
</tr>
<tr>
<td>Number of Doses</td>
<td>12 weekly doses</td>
<td>120 daily doses</td>
<td>270 daily doses</td>
</tr>
<tr>
<td>Avg. Number of pills</td>
<td>9 pills</td>
<td>2 pills</td>
<td>1 pills + vitamin</td>
</tr>
<tr>
<td>Cost- Cash/Patient</td>
<td>$377/$60-70</td>
<td>$199/$30-60</td>
<td>$149/$30</td>
</tr>
<tr>
<td>Number of visits</td>
<td>12 weekly visits</td>
<td>4 monthly visits</td>
<td>9 monthly visits</td>
</tr>
<tr>
<td>Potential Side Effects</td>
<td>Rash, GI side effects, Hepatitis, Hematologic, Peripheral Neuropathy Colored Secretions</td>
<td>Rash, GI side effects, Hepatitis, Hematologic Colored secretions</td>
<td>Rash, GI Side Effects Hepatitis, Peripheral Neuropathy</td>
</tr>
<tr>
<td>Considerations</td>
<td>Avoid in pregnancy Drug interactions- OCP Avoid alcohol</td>
<td>Avoid in pregnancy Drug interactions- OCP Avoid alcohol</td>
<td>OK in pregnancy Avoid alcohol</td>
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### OSU Initiation Rate (IR) for LTBI Treatment

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<tbody>
<tr>
<td><strong>Initiation Rate (IR)</strong></td>
<td>35.2 % (19/54)</td>
<td>71.1 % (27/38)</td>
<td>70.0 % (28/40)</td>
<td>65.8 % (25/38)</td>
</tr>
<tr>
<td><strong>Decline Treatment</strong></td>
<td>25.9 % (14/54)</td>
<td>21.0 % (8/38)</td>
<td>30.0 % (12/40)</td>
<td>34.2 % (13/38)</td>
</tr>
<tr>
<td><strong>Undecided</strong></td>
<td>0.0 % (0/0)</td>
<td>0.0 % (0/0)</td>
<td>0.0 % (0/0)</td>
<td>0.0 % (0/38)</td>
</tr>
<tr>
<td><strong>Lost to Follow-Up</strong></td>
<td>38.9 % (21/54)</td>
<td>7.9 % (3/38)</td>
<td>0.0 % (0/0)</td>
<td>0.0 % (0/0)</td>
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Patient preference for LTBI regimens

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<tbody>
<tr>
<td>3HP</td>
<td>68.4 % (13/19)</td>
<td>70.4 % (19/27)</td>
<td>59.3 % (16/27)</td>
<td>48.0 % (12/25)</td>
</tr>
<tr>
<td>9H</td>
<td>31.6 % (6/19)</td>
<td>29.6 % (8/27)</td>
<td>29.6 % (8/27)</td>
<td>8.0 % (2/25)</td>
</tr>
<tr>
<td>4R</td>
<td>Not offered</td>
<td>Not Offered</td>
<td>11.1 % (3/27)</td>
<td>44.0 % (11/25)</td>
</tr>
</tbody>
</table>

Completion rates (CR) for LTBI regimens

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<tbody>
<tr>
<td>3HP</td>
<td>84.6 % (11/13)</td>
<td>94.7 % (18/19)</td>
<td>93.8 % (15/16)</td>
<td>91.7 % (11/12)</td>
<td>91.7 % (55/60)</td>
</tr>
<tr>
<td>9H</td>
<td>83.3 % (5/6)</td>
<td>75.0 % (6/8)</td>
<td>100.0 % (8/8)</td>
<td>50.0 % (1/2)</td>
<td>83.3 % (20/24)</td>
</tr>
<tr>
<td>4R</td>
<td>Not offered</td>
<td>Not offered</td>
<td>100.0 % (3/3)</td>
<td>100.0 % (11/11)</td>
<td>100.0 % (14/14)</td>
</tr>
</tbody>
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In summary . . .

• Mandatory screening/counseling tied to registration status
• Require second LTBI counseling session if undecided or declined treatment
• Use The BCG World Atlas and The Online TST/IGRA Interpreter as counseling tools
• Offer shorter treatment regimens: 3HP and 4R
• Utilize TB screening coordinator to track students through the screening, counseling, and treatment process