NEMS
Epic TB Workflows

Meagan Lee, Research Coordinator
Dr. Amy Tang, Director of Immigrant Health
Background

- North East Medical Services (NEMS) began serving patients in 1971
- FQHC serving medically underserved Asian Americans and other marginalized populations
- 14 clinic locations across the San Francisco Bay Area
NEMS Services

- Adult Medicine
- Pediatrics
- Obstetrics & Gynecology
- Dental
- Optometry
- Pharmacy
- Laboratory
- Radiology
- Health Education
- Member Services
- Chiropractic
- Behavioral Health Services
- Social Services
- Acupuncture
- Physical Therapy

Medical Specialties 醫療專科
- Cardiology 心臟科
- Endocrinology 內分泌科
- Gastroenterology 腸胃科
- Hand Surgery Consultation 手外科
- Hepatology 肝臟科
- Neurology 神經內科
- Ophthalmology 眼科
- Otolaryngology 耳鼻喉科
- Podiatry 足科
- Psychiatry 精神科
- Surgery 外科
88%  Asian

80%  Better served in a language other than English

78%  Medicaid (includes 18% Medicare-Medicaid dual eligible)

6.5%  Uninsured

27%  65 years and older
Tuberculosis at NEMS

- In 2022, 25% (14/57) of TB cases in San Francisco occurred among NEMS patients
- ~20 to 40% of NEMS’ adult patient population screens TB test positive
Non-US-born patients seen for a medical visit and tested for tuberculosis over time, 2010-2019

NEMS EHR Timeline

- **1971**: paper system
- **2010**: NextGen rollout
- **October 2, 2023**: Epic rollout
Risk Assessment: Place and Region of Birth

Place and Region of Birth collected upon patient registration along with detailed ethnicity, preferred language, and time of entry in the US

- Region of Birth required if Place of Birth is China
- Collected in NextGen since November 2020

<table>
<thead>
<tr>
<th>Additional</th>
<th>Region of Birth</th>
<th>Preferred Language</th>
<th>Ethnicity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Place of Birth</td>
<td>China</td>
<td>Chinese - Cantonese</td>
<td>Not Hispanic, Latino/a, or Spanish</td>
</tr>
<tr>
<td></td>
<td>Guangdong</td>
<td>Written Language</td>
<td>origin</td>
</tr>
<tr>
<td>Date of Entry into US</td>
<td>3/3/2003</td>
<td>Simplified Chinese</td>
<td>Race</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Chinese</td>
</tr>
</tbody>
</table>

![Image of warning message for Region of Birth requirement]
Risk Assessment:
TB Risk Assessment

- **Initial** and **Annual** TB Risk Assessment completed by the patient with other annual health screening forms
  - Originally conducted by medical assistant or provider

- Annual TB Risk Assessment given to patients without:
  - Prior positive TB test or
  - ICD-code for LTBI or TB
Screening: TB Care Gap

Care gap for TB screening with IGRA on patient’s Storyboard IF:

- Place of birth in high-risk TB region and
- No prior TB test (IGRA/TST) and
- No ICD-code for LTBI or TB
Opt-out reasons:
• Prior TB testing
• Prior LTBI treatment
• Prior diagnosis active TB disease
• Prior treatment for active TB disease
Screening: TB Screening Best Practice Alert

BPA to identify less common risk factors of immunosuppression:

- ICD code or medications for HIV or
- ICD-codes for organ transplant recipient or
- Immunosuppressive medications and
- No prior TB testing
CL TB SCREENING FOR IMMUNOSUPRESSED PATIENTS EXCLUDE DX [372]

[Image of a document page with a table of ICD codes and a section highlighted]

DX [371]

[Image of another document page with a similar table and highlighted section]
Screening: IGRA Results Co-Located with TST Results under Results Review Mycobacteria/TB Sub-section

<table>
<thead>
<tr>
<th>MYCOBACTERIA/TB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Purified Protein Derivative Skin Test</td>
</tr>
<tr>
<td>Induration</td>
</tr>
<tr>
<td>QUANTIFERON-TB GOLD</td>
</tr>
<tr>
<td>MITOGEN-NIL</td>
</tr>
<tr>
<td>NIL</td>
</tr>
<tr>
<td>TB1-NIL</td>
</tr>
<tr>
<td>TB2-NIL</td>
</tr>
</tbody>
</table>
Evaluation/Treatment: TST SmartPhrase

- SmartPhrase used as reference for TST interpretation
- Can be search by using the following terms:
  - TBINTERPRETATION
  - TB
  - TBSKIN
  - TBSCALE

The definition of a positive tuberculin skin test depends on a person’s prior probability of having LTBI and the person’s risk of developing active TB.

≥5 mm of induration:
- Persons known or suspected to have HIV infection.
- Recent contacts to an active case of pulmonary or laryngeal TB.
- Persons with fibrotic changes seen on chest radiograph consistent with TB.
- Immunocompromised individuals.

≥10 mm of induration:
- All persons except those in above.

NOTE: The CDC recommends using a 15 mm cutoff for low risk reactors. However, in California, using a 10mm cutoff is the standard due to the higher incidence of TB in the state compared to other parts of the US.
Evaluation/Treatment: TB Smart Set

TB Smart Set includes:

- TB guideline links
- Note template
- Diagnosis codes
- Lab orders
- Imaging
- Common treatment
**LTBI Treatment Evaluation and Monitoring**

When prescribing INH-containing regimens, obtain baseline ALT, AST and CBC if age > 50, heavy EtOH, liver disease, hepatotoxic meds, IVDUs, pregnant/up to 3 months postpartum, HIV, and monthly during treatment if baseline ALT elevated or continued heavy EtOH.

- Hepatic function panel
- Comprehensive metabolic panel
- CBC
- HIV-1 and HIV-2 antibodies
- Hepatitis C antibody
- HBV Screening

**LTBI Diagnosis**

- Latent tuberculosis [Z22.7]
- Nonspecific reaction to tuberculin skin test without active tuberculosis [R76.11]
- Nonspecific reaction to cell mediated immunity measurement of gamma interferon antigen response without active tuberculosis [R76.12]

**History of TB Disease**

- Personal history of tuberculosis [Z86.11]

**TB Test Orders and Imaging**

**Screening Orders**

- QUANTIFERON TB GOLD
- TB Skin Test

**TB Evaluation Orders**

- XR chest 1 view (for asymptomatic adults and children ≥5 years)
- XR chest 2 views (for children < 5 years or any age with symptoms or immunocompromised)
- MTB PCR + AFB SPITUM SMEAR AND CULTURE X 3

**Rifampin for 4 months**

Rifampin/rifamycin is a potent CYP-450 inducer; check for significant drug-drug interactions; reference link below.

For adults: 10 mg/kg; max 600mg
For children or adolescents: 15-20mg/kg; max 600mg

- rifAMPIn (Rifadin) 300 mg capsule
- rifAMPIn (Rifadin) 150 mg capsule

**Isoniazid for 6 to 9 months**

Isoniazid:

- For adults: 5mg/kg; max 300mg
- For children or adolescents: 10-15 mg/kg; max 300mg

Pyridoxine (B6) 25-50mg once daily with food (should be added for patients with diabetes, alcoholism, malnutrition, pregnancy, or other conditions associated with neuropathy)

- isoniazid (Nydrazid) 300 mg tablet
- pyridoxine (Vitamin B-6) 25 mg tablet
Rifapentine + Isoniazid x 12 weeks

Rifapentine/rifamycin is a potent CYP-450 inducer; check for significant drug-drug interactions; reference link below.

Isoniazid:
- For adults: 15mg/kg rounded to nearest 50 or 100mg; 900mg max
- For children and adolescents:
  - 2-11 years: 25mg/kg rounded up to the nearest 50 or 100mg (max 900mg)
  - >=12 years: 15mg/kg rounded up to the nearest 50 or 100mg (max 900mg)

Rifapentine:
- For children, adolescents, and adults:
  - 10-15 kg: 300mg
  - 15.1-25 kg: 450mg
  - 25.1-32 kg: 600mg
  - 32.1-49.9 kg: 750mg
  - >=50kg: 900mg (max)

Pyridoxine (B6) 50mg weekly (should be added for patients with diabetes, alcoholism, malnutrition, pregnancy, or other conditions associated with neuropathy)
- ☐ isoniazid (Nydrazid) 300 mg tablet
- ☐ rifapentine 150 mg tablet
- ☐ pyridoxine (B6) 50 mg tablet

Rifampin + Isoniazid x 3 months

generally used for patients with evidence of prior TB disease/abnormal imaging

Isoniazid:
- For adults: 5mg/kg; max 300mg
- For children or adolescents: 10-20 mg/kg; max 300mg

Rifampin:
- For adults: 10 mg/kg; max 600mg
- For children or adolescents: 15-20mg/kg; max 600mg

☐ isoniazid (Nydrazid) 300 mg tablet
☐ rifAMPin (Rifadin) 300 mg capsule

TB Clinic Referral
- San Francisco
- San Mateo
- Santa Clara

TB Guidance
- California Adult TB Risk Assessment (CDPH/CTCA)
- “California Pediatric TB Risk Assessment” (CDPH/CTCA)
- “Prevent TB in 4 Steps: A Guide for Medical Providers” (CDPH)
- “LTBI: A Guide for Primary Care Providers” (CDC)
- “Testing and Treatment of LTBI in the US: Clinical Recommendations” (NTCA)
- Rifampin Drug-Drug Interactions
- Home Sputa collection instructions (in English, Chinese, Spanish)
- Home Isolation Instructions
Outreach: TB Care Gap Outreach Report

Community Health Workers use TB Care Gap Outreach Report to identify patients with care gaps for **individual** and **bulk** TB outreach.
TB outreach letters can be generated and mailed or sent via MyChart to patients with the TB screening care gap.
Summary

Custom-built TB screening forms, care gaps, BPAs, and Smart Sets can help promote risk-based TB screening and evaluation.

Epic care gap reports can be used for both individual and bulk community health worker outreach.
Thank you!