

# NEMS

# Epic TB Workflows

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**NORTH EAST**  
**MEDICAL SERVICES**  
東北醫療中心  
a californiah<sup>h</sup>center

# 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  
成人內科



Pharmacy  
藥房



Pediatrics  
兒科



Laboratory  
化驗部



Obstetrics &  
Gynecology  
婦產科



Radiology  
放射部/X光



Dental  
牙科



Behavioral  
Health Services  
心理健康服務部



Optometry  
驗眼/配鏡科



Social Services  
社會服務部



Health Education  
健康教育部



Member Services  
會員服務部



Chiropractic  
脊椎神經科



Acupuncture  
針灸科



Physical Therapy  
物理治療中心

## 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



# NEMS Patient Demographics

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**88%** Asian

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**80%** Better served in a language other than English

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

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**6.5%** Uninsured

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**27%** 65 years and older

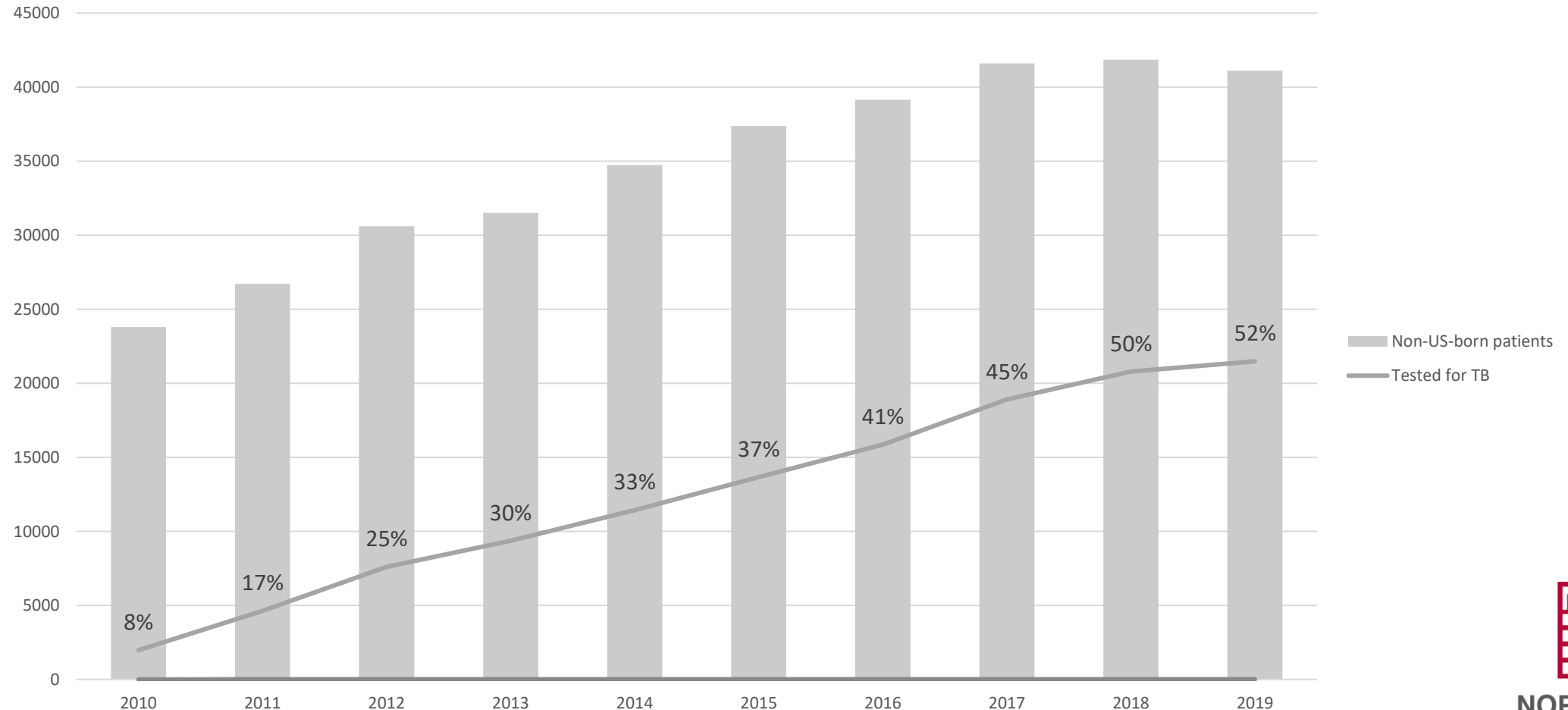


# Tuberculosis at NEMS

- 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



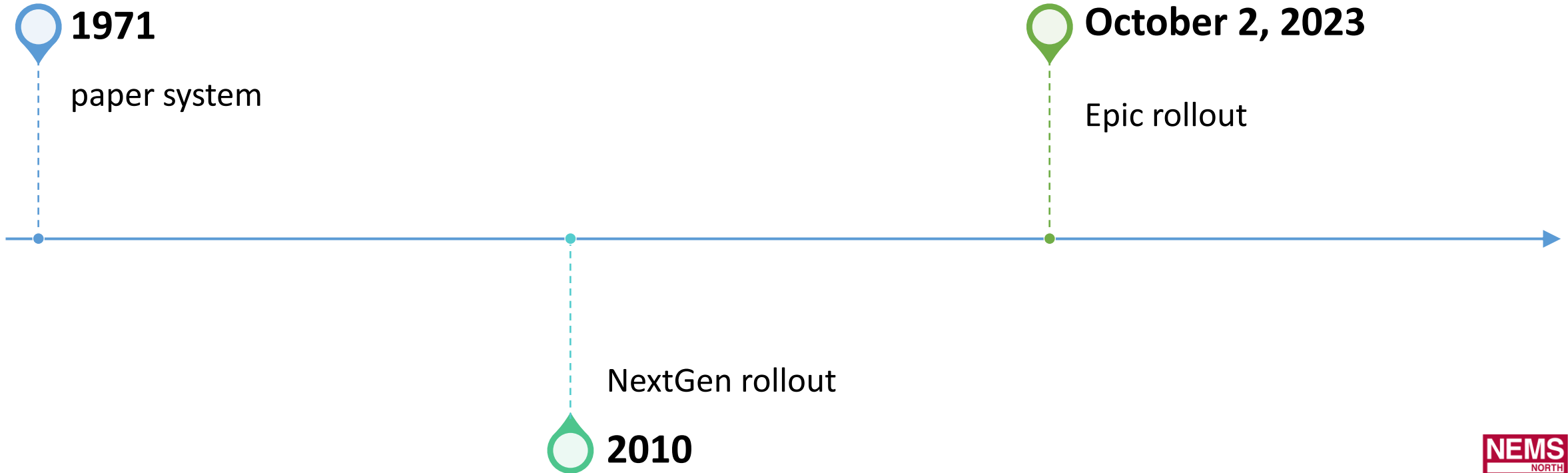
# Non-US-born patients seen for a medical visit and tested for tuberculosis over time, 2010-2019



Tang AS, Mochizuki T, Dong Z, Flood J, Katrak SS. J Immigr Minor Health. Jan 2023



# NEMS EHR Timeline



# 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

## Additional

Place of Birth  
China

Date of Entry into US  
3/3/2003

Region of Birth  
Guangdong

Religion  
None

Preferred Language  
Chinese - Cantonese  
Written Language  
Simplified Chinese

Ethnicity  
Not Hispanic, Latino/a, or Spanish origin  
Race  
Chinese

The screenshot shows a patient registration form with a modal dialog box titled 'Demographics' overlaid on top. The dialog box contains a red 'X' icon and the following text: 'Region of Birth is required. Start Date is recommended. Number is recommended.' Below the text is an 'OK' button with a green checkmark. The background form shows fields for 'Marital Status' (Single), 'Form Confidence' (Very good), 'Ethnic Group', 'Religion' (None), 'Place of Birth' (China), and 'Region of Birth'. The 'Region of Birth' field has a red exclamation mark icon next to it, indicating an error.





# 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

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Your Menu Visits Messages Test Results Medications

### Initial TB Risk Assessment

Attached to a message from Celia L received 9/5/2023

\* Indicates a required field.

\* 1. Have you ever traveled to or lived in Asia, Pacific Islands (excluding Hawaii), Latin America, Africa, Middle East, or Eastern Europe for at least 1 month?

Yes No

\* 2. Have you ever had close contact to someone with infectious TB disease?

Yes No

\* 3. Have you ever received an organ transplant or been diagnosed with HIV?

Yes No

\* 4. Are you currently on or plan to take a medication that suppresses your immune system such as steroids?

Yes No

\* 5. Have you ever stayed in a homeless shelter or lived in a single room occupancy hotel?

Yes No

Continue Finish later Cancel

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### Annual TB Risk Assessment

Attached to a message from Celia L received 9/12/2023

\* Indicates a required field.

\* 1. Within the last year, have you traveled to Asia, Pacific Islands (excluding Hawaii), Latin America, Africa, Middle East, or Eastern Europe for at least 1 month?

Yes No

\* 2. Within the last year, have you had close contact to someone with infectious TB disease?

Yes No

Continue Finish later Cancel



# 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



PCP - General  
Primary Cvg: None

---

Allergies: No Known Allergies

---

Wt: 65.3 kg (144 lb)  
BMI: **25.31 kg/m<sup>2</sup> !**  
BP: 114/81 >1 day

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**SINCE LAST FAMILY MEDICINE VISIT**

No visits  
 No results

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**CARE GAPS**

- TB Screening
- HIV Screening
- Influenza Vaccine (1)



Opt-out reasons:

- Prior TB testing
- Prior LTBI treatment
- Prior diagnosis active TB disease
- Prior treatment for active TB disease

The screenshot shows a software window titled "Address Topic" with a close button (X) in the top right corner. Below the title bar, there is a header section for "TB Screening" with the text "Topic will be discontinued". Two buttons are visible: a grey "Postpone" button with a circular arrow icon and a green "Discontinue" button with a red prohibition sign icon. Below these buttons is a "Discontinue Reason" section with a search input field. A dropdown menu is open, displaying a table of reasons:

Title	Number
Medical Decision	210000004
Prior Diagnosis of Active TB Disease	210000009
Prior LTBI Treatment	210000007
Prior TB Testing	210000006
Prior Treatment for Active TB Disease	210000008

At the bottom of the window, there is a status bar with the text "Never done Discontinued" and two buttons: "Accept" with a green checkmark icon and "Cancel" with a red X icon.



# 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

The screenshot displays the Epic EHR interface for a patient named Timothy Ambulatory. The main window shows a decision support editor for 'BASE AMB TB SCREENING FOR IMMUNOSUPRESSED PATIENTS [366]'. A disclaimer is visible at the top, stating that the content is not a substitute for testing. Below the disclaimer, there are two buttons: 'Pop-up Preview' and 'Navigator Preview'. A red arrow points to a yellow alert box titled 'Important (1) Patient recommended TB screening due to immunosuppression'. The alert contains the following text and buttons:

Order Do Not Order Quantiferon TB Gold

Acknowledge Reason \_\_\_\_\_

Action Taken Does Not Meet Criteria

Accept Dismiss



# CL TB SCREENING FOR IMMUNOSUPPRESSED PATIENTS EXCLUDE DX [372]

Open Create Metadata Save Save As Read-Only

- Summary
- Used By
- Edit
- Contact Comment
- Display
- Criteria
  - Diagnoses
  - Add Criteria Type

VCG Items	ICD FOR LATENT OR ACTIVE TB INFECTION [121922] - 1																																	
1 - GROUPE ID	No-Add 1 121922 [121922]																																	
2 - GROUPE NAME	No-Add 1 ICD FOR LATENT OR ACTIVE TB INFECTION																																	
9 - LOGICAL OWNER	No-Add 1 DEPLOYMENT [120]																																	
10 - CONTACT NUMBER	Contact 1 1																																	
Related Group 11	<table border="1"> <thead> <tr> <th>No-Add</th> <th>11 - COMMUNITY ID</th> <th>12 - CID DESCRIPTOR</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>51321971</td> <td>NO702</td> </tr> </tbody> </table>	No-Add	11 - COMMUNITY ID	12 - CID DESCRIPTOR	1	51321971	NO702																											
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1	51321971	NO702																																
17 - PHYSICAL OWNER	No-Add 1 DEPLOYMENT [120]																																	
20 - CONTACT DATE	Contact 1 1 07/03/2023 [66658]																																	
30 - RECORD TYPE	No-Add 1 Base [1]																																	
50 - CONTEXT	No-Add 1 EDG																																	
60 - GROUPE TYPE	No-Add 1 ICD Codes [3]																																	
70 - RESTRICT TO SNOMED CONCEPTS	No-Add 1 No [2]																																	
Related Group 300	<table border="1"> <thead> <tr> <th>No-Add</th> <th>300 - ICD CODES</th> <th>305 - ICD CODE SET</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>9</td> <td>9</td> </tr> <tr> <td>1</td> <td>Z22.7</td> <td>ICD-10-CM [2]</td> </tr> <tr> <td>2</td> <td>R76.11</td> <td>ICD-10-CM [2]</td> </tr> <tr> <td>3</td> <td>R76.12</td> <td>ICD-10-CM [2]</td> </tr> <tr> <td>4</td> <td>Z86.15</td> <td>ICD-10-CM [2]</td> </tr> <tr> <td>5</td> <td>Z86.11</td> <td>ICD-10-CM [2]</td> </tr> <tr> <td>6</td> <td>A15</td> <td>ICD-10-CM [2]</td> </tr> <tr> <td>7</td> <td>A17</td> <td>ICD-10-CM [2]</td> </tr> <tr> <td>8</td> <td>A18</td> <td>ICD-10-CM [2]</td> </tr> <tr> <td>9</td> <td>A19</td> <td>ICD-10-CM [2]</td> </tr> </tbody> </table>	No-Add	300 - ICD CODES	305 - ICD CODE SET	0	9	9	1	Z22.7	ICD-10-CM [2]	2	R76.11	ICD-10-CM [2]	3	R76.12	ICD-10-CM [2]	4	Z86.15	ICD-10-CM [2]	5	Z86.11	ICD-10-CM [2]	6	A15	ICD-10-CM [2]	7	A17	ICD-10-CM [2]	8	A18	ICD-10-CM [2]	9	A19	ICD-10-CM [2]
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9	A19	ICD-10-CM [2]																																
9000 - INSTANT OF ENTRY	Contact 1 1 07/03/2023 2:59 PM PDT [5759305199[PD1]																																	
9200 - LAST EDITOR SAVE INSTANT	No-Add 1 07/03/2023 10:02 PM UTC [5759330531]																																	
9210 - LAST COMPILED INSTANT	No-Add 1 07/03/2023 10:02 PM UTC [5759330532]																																	
82003 - SLICERDICER EXCLUSION	No-Add 1 No [0]																																	

## R IMMUNOSUPPRESSED PATIENTS M

Save Save As Read-Only

Released ID: 368

- Generic Medication
- abatacept
  - abrocitinib
  - adalimumab
  - alemtuzumab
  - anakinra
  - baricitinib
  - brodalumab
  - canakinumab/PF
  - certolizumab pegol
  - deucravacitinib
  - emapalumab-lzsg
  - etanercept
  - golimumab
  - guselkumab
  - inebilizumab-cdon
  - infliximab
  - ixekizumab
  - rilonacept
  - risankizumab-rzaa
  - rituximab
  - ruxolitinib phosphate
  - sarilumab
  - satralizumab-mwge
  - secukinumab



## DX [371]

### DENITRY ORGAN TRANSPLANT RECIPIENTS [121914] - 1

Add	300 - ICD CODES	305 - ICD CODE SET
0	Z8	Z8
1	Z98.85	ICD-10-CM [2]
2	Z94.9	ICD-10-CM [2]
3	Z94.89	ICD-10-CM [2]
4	Z94.84	ICD-10-CM [2]
5	Z94.83	ICD-10-CM [2]
6	Z94.82	ICD-10-CM [2]
7	Z94.81	ICD-10-CM [2]
8	Z94.4	ICD-10-CM [2]
9	Z94.3	ICD-10-CM [2]
10	Z94.2	ICD-10-CM [2]
11	Z94.1	ICD-10-CM [2]
12	Z94.0	ICD-10-CM [2]
13	Z48.2	ICD-10-CM [2]
14	T86.99	ICD-10-CM [2]
15	T86.93	ICD-10-CM [2]
16	T86.92	ICD-10-CM [2]
17	T86.91	ICD-10-CM [2]
18	T86.90	ICD-10-CM [2]
19	T86.89	ICD-10-CM [2]
20	T86.85	ICD-10-CM [2]
21	T86.81	ICD-10-CM [2]
22	T86.5	ICD-10-CM [2]
23	T86.4	ICD-10-CM [2]
24	T86.3	ICD-10-CM [2]
25	T86.2	ICD-10-CM [2]
26	T86.1	ICD-10-CM [2]
27	T86.0	ICD-10-CM [2]
28	D47.Z1	ICD-10-CM [2]



# Screening: IGRA Results Co-Located with TST Results under Results Review Mycobacteria/TB Sub-section

MYCOBACTERIA/TB  
Purified Protein Derivative Skin Test
Induration
QUANTIFERON-TB GOLD
MITOGEN-NIL
NIL
TB1-NIL
TB2-NIL



# Evaluation/ Treatment: TST SmartPhrase

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

My Note

4:42 PM

 Edit  Delete  Copy



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.
- Immunosuppressed 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.



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# Evaluation/ Treatment: TB Smart Set

TB Smart Set includes:

- TB guideline links
- Note template
- Diagnosis codes
- Lab orders
- Imaging
- Common treatment

The screenshot shows the Epic EMR interface for a patient named Timothy Ambulatory. The patient's information includes: Male, 75 y.o., 6/11/1948, MRN: 203035. The patient is currently scheduled for a program for All-Inclusive Care of the Elderly. The interface displays a 'Plan' section with tabs for Med Management, SmartSets, and BestPractice. Under the SmartSets tab, there is a search bar and a list of SmartSets. The 'LTBI Smart Set' is selected, indicated by a checked checkbox and a red box around it. Other SmartSets listed include Hepatitis B Smartset, Hepatitis C, Hepatitis C Smartset, Hepatitis C Screening, and Seborrheic Keratosis. The interface also shows buttons for 'Open SmartSets' and 'Clear Selection'.





## LTBI Smart Set

 [Manage User Versions](#)

### ▼ **Diagnosis Codes**

#### ▼ LTBI Screening

- Contact with and (suspected) exposure to tuberculosis [Z20.1] (accepted by Medicare)
- Encounter for testing for latent tuberculosis infection [Z11.7]
- Encounter for observation for other suspected diseases and conditions ruled out [Z03.89] (accepted by Medicare)

#### ▼ 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  $\geq 5$  years) 
- XR chest 2 views (for children  $< 5$  years or any age with symptoms or immunocompromised) 
- MTB PCR + AFB SPUTUM SMEAR AND CULTURE X 3

### ▼ **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, IVDU, 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

### ▼ **Treatment Orders**

#### ▼ 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 (Nydravid) 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)

>=12years: 15mg/kg rounded up to the nearest 50 or 100mg (max900mg)

##### Rifapentine:

For children, adolescents, and adults

10-15 kg : 300mg

14.1-25 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 (B-6) 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](#)

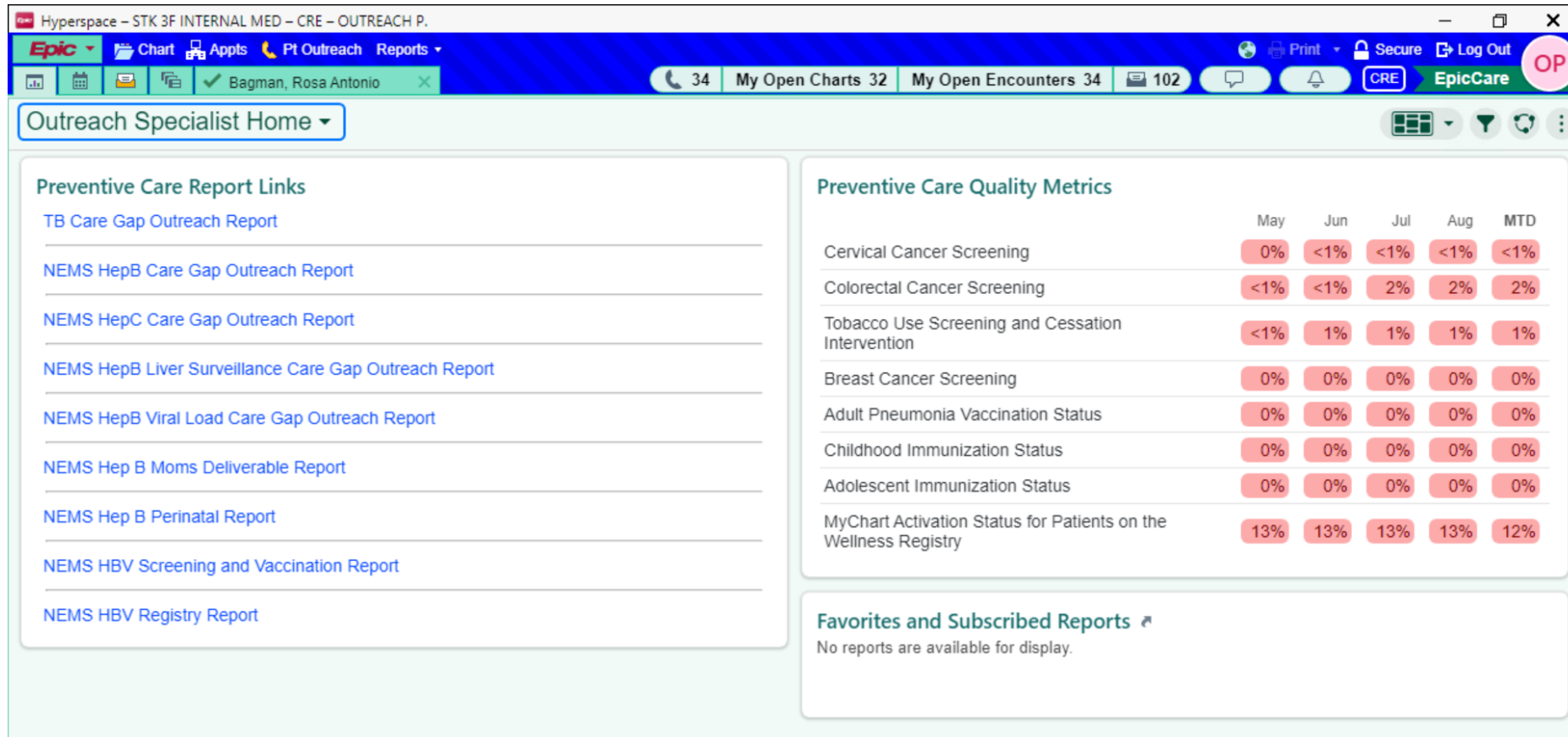
#### ▼ TB Guidance ←

- ["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" \(NTCA\)](#)
- [Rifamycin 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



The screenshot shows the Epic Hyperspace interface for a user named Bagman, Rosa Antonio. The page is titled "Outreach Specialist Home" and features several sections:

- Preventive Care Report Links:** A list of links for various outreach reports, with the "TB Care Gap Outreach Report" link highlighted by a red arrow.
- Preventive Care Quality Metrics:** A table showing performance metrics for various preventive care services across the months of May, June, July, August, and the Month-to-Date (MTD).
- Favorites and Subscribed Reports:** A section indicating that no reports are currently available for display.

	May	Jun	Jul	Aug	MTD
Cervical Cancer Screening	0%	<1%	<1%	<1%	<1%
Colorectal Cancer Screening	<1%	<1%	2%	2%	2%
Tobacco Use Screening and Cessation Intervention	<1%	1%	1%	1%	1%
Breast Cancer Screening	0%	0%	0%	0%	0%
Adult Pneumonia Vaccination Status	0%	0%	0%	0%	0%
Childhood Immunization Status	0%	0%	0%	0%	0%
Adolescent Immunization Status	0%	0%	0%	0%	0%
MyChart Activation Status for Patients on the Wellness Registry	13%	13%	13%	13%	12%





Outreach Details Routing Details

✔ Communication Preference Calculation Completed

## Template Selection

Mail/Phone template: NEMS HP OUTREACH T... NEMS MyChart template: NEMS HP OUTREACH T... 

Mail/Phone View NEMS MyChart View

Show preview for:   Edit Template**BLOOD TEST REMINDER**

10/25/23

Dear

Our records show that you are due for the following test:

- **Tuberculosis (TB)** - The United States Preventative Services Task Force (USPSTF) and Centers for Disease and Control (CDC) recommend screening for individuals born in places with higher risk for TB exposure (e.g., most Asian and African countries). For more information, visit [www.cdc.gov/thinktesttreattb/](http://www.cdc.gov/thinktesttreattb/)

People infected with TB may not feel sick or have any symptoms. If you have untreated TB infection, you may be at risk of getting sick with active TB disease in the future and pass the germ to others who are close to you.

The good news is there are blood tests to detect TB and treatment to prevent their complications. If you have had prior TB testing or treatment, please inform your provider at your next visit.

**Please call the NEMS Screening line at (415) 352-5115 to schedule a blood draw appointment or discuss any questions by 12/31/23.** These tests are covered by most insurances and offered at no-cost for self-pay or underinsured patients. **Please bring this letter and your NEMS ID card to the appointment.**

Please note: This is NOT a clinic appointment with your medical provider. This appointment is for a blood draw. If you would like to schedule a clinic appointment, please call our Call Center at (415) 391-9686 ext. 8150.

Thank you for choosing North East Medical Services for your care.

TB outreach letters can be generated and mailed or sent via MyChart to patients with the TB screening care gap



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# 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!

