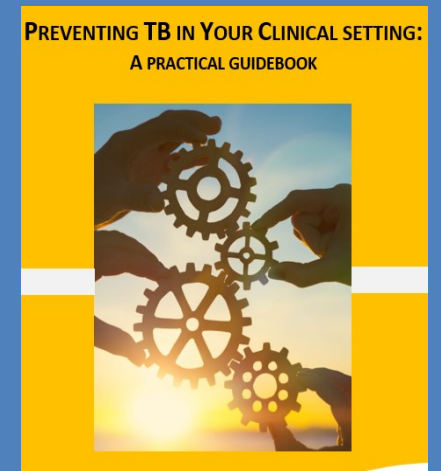


MEASUREMENT OF THE LTBI CARE CASCADE

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Declaration of Disclosure

We have not had any relevant financial relationships or conflicts of interest with commercial interests that may have a direct bearing on the subject matter presented.

Learning Objectives

1. Walk through the 7 steps of the LTBI Care Cascade
2. Provide examples of ways to measure each step
3. Demonstrate the application of the Care Cascade Tool using real data
4. Identify potential reasons for attrition at each cascade step and offer possible solutions to barriers
5. Engage in activities to facilitate discussion and thought around the LTBI care cascade at your clinic



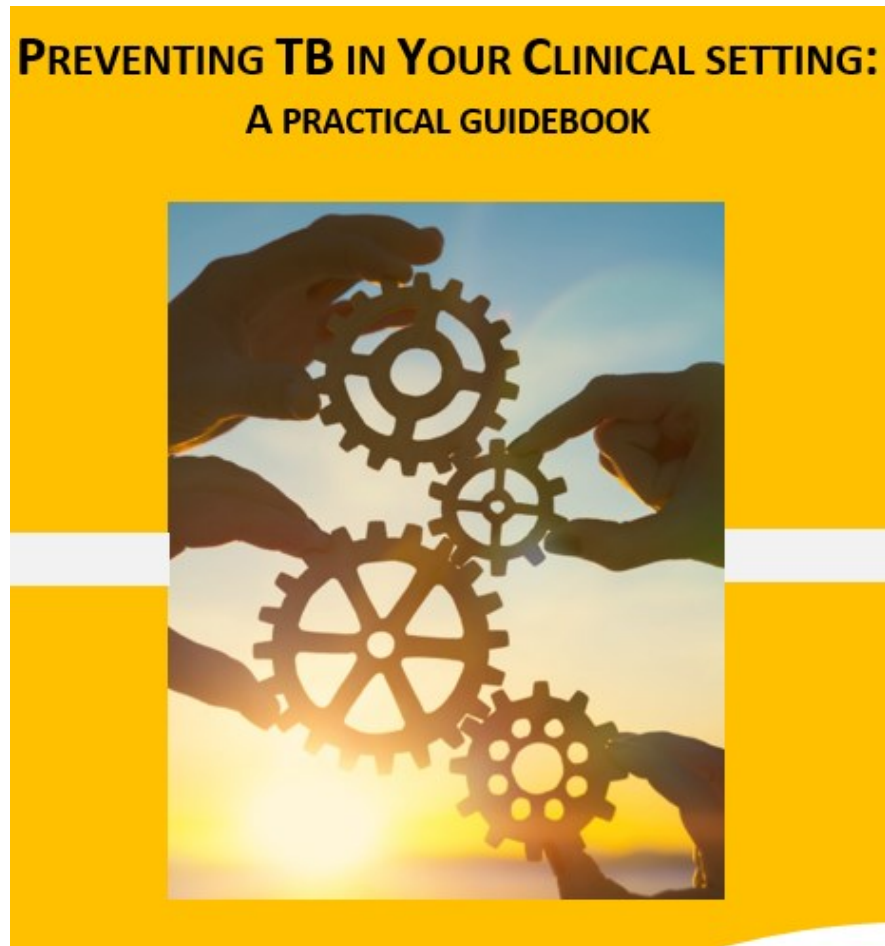
TB Free California

- Established 2017
- Work on TB prevention in CA (~2 million have LTBI)
- Help integrate TB prevention into primary care
- Goal: Increase LTBI testing & treatment at community clinics

Our Team

- Conduct provider training & offer clinical support
- Carry out patient education & community engagement
- Offer epidemiologic & data management support for measuring LTBI practices

Need for standardizing the Approach: Enter the “TB Prevention Guidebook”



Goals

- Provide instructions for implementing TB prevention
- Share best practices
- Address common concerns
- Put forth standards for measuring and monitoring LTBI

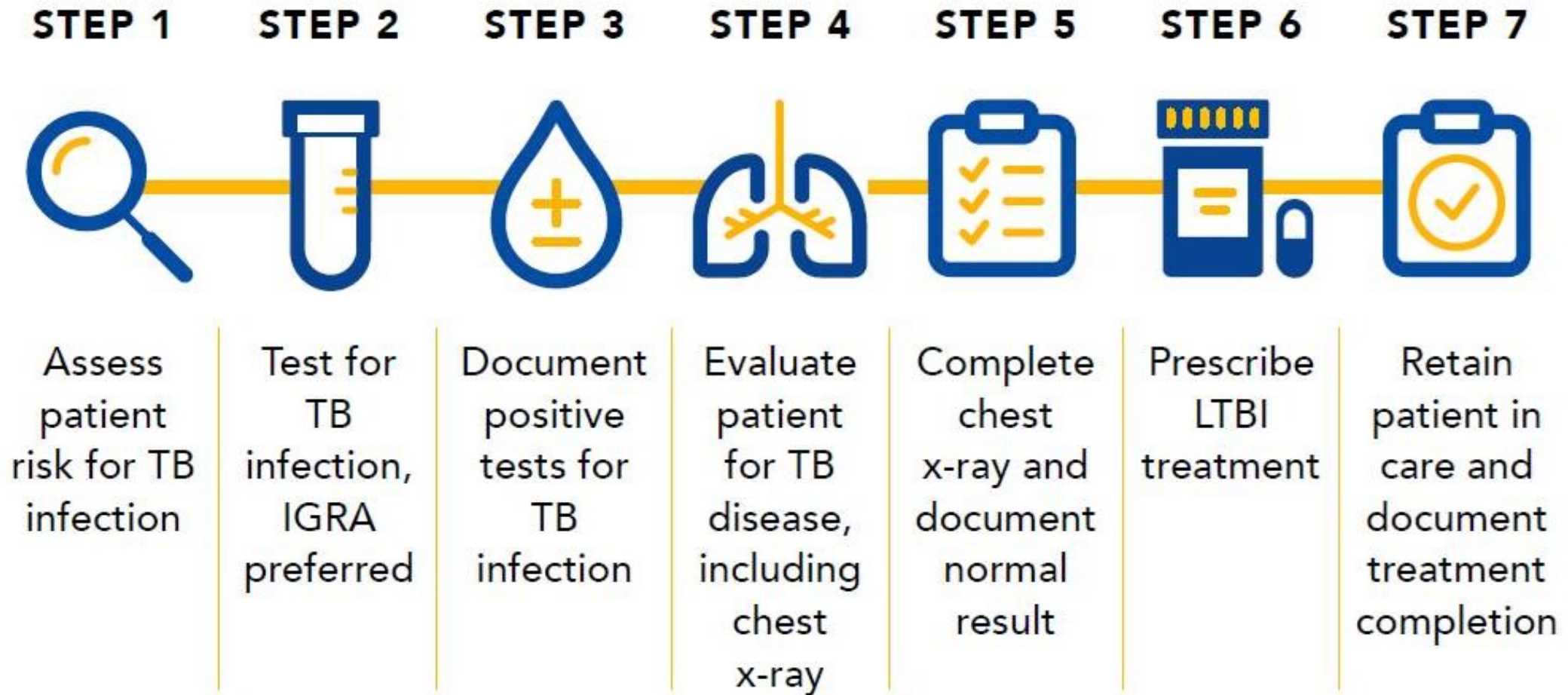
Intended audience

- Clinic staff interested in improving LTBI care

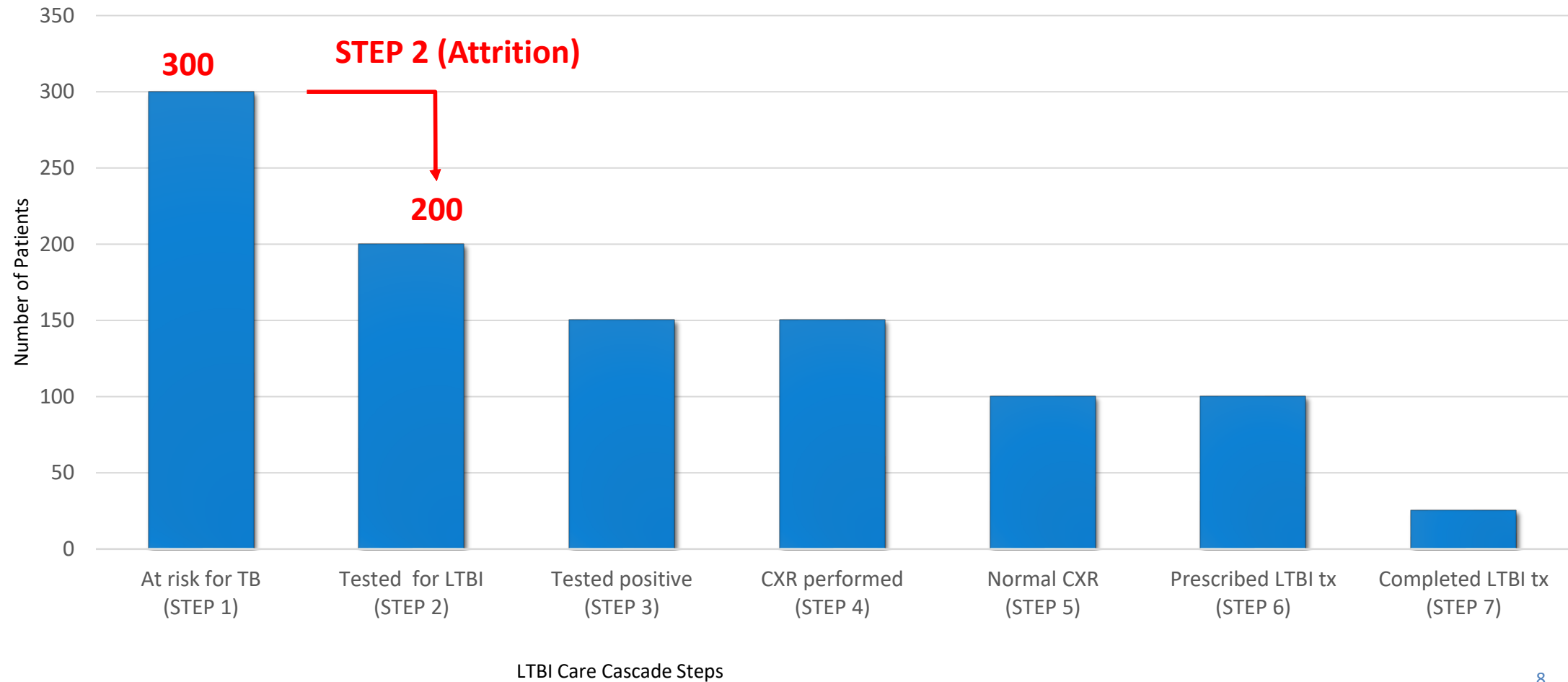
Best practices for TB prevention

Screen	Screen to identify patients experiencing risk
Test	Test using an IGRA
Treat	Treat with short-course, rifamycin-based regimens

LTBI Care Cascade Steps Overview



Hypothetical LTBI Care Cascade



Step 1: Assess patient risk for TB infection



**Birth, travel or residence
(>1 month) in a country
with an elevated TB rate**



Immunosuppression



**Close contact to someone
with infectious TB disease
during lifetime**

Step 1 measurement: Number of patients with at least one risk factor

- Use birth country from “registration” section in EMR
- Find immunosuppression status in “medications” section in the EMR (i.e. HIV, transplant, steroids)
- Find contact to a infectious TB case in the “chronic problem” list

Step 2: Test for TB infection

Preferred: Interferon-gamma release assay (IGRA) QFT or T-SPOT



TB skin test (TST), also known as PPD



Step 2 measurement: Number of patients tested

- If IGRA, look for lab order in the “orders”, “laboratory” or “results” section in EMR
- If TST, look for documentation in the EMR’s “Immunization” or “notes” section

Step 3: Document positive test for TB infection

IGRA interpretation

Measure release of interferon-gamma following stimulation by antigens unique to TB

- QuantiFERON®-TB Gold (QFT)
 - Reported as positive, negative, or indeterminate
- T-SPOT.TB (T-Spot)
 - Reported as positive, borderline, negative, or indeterminate



TST Interpretation

Measure induration (not erythema) at 48-72 hours

- Reported as positive or negative
- Record millimeters
- Positive test:
 - $\geq 5\text{mm}$ for immunosuppressed including HIV, recent contacts
 - $\geq 10\text{mm}$ for all others with TB risk

Step 3 measurement: Number of patients with positive test

- For IGRA results look for lab report in “laboratory” or “results” in EMR
- For TST results look in EMR “immunization” or “notes” section in EMR

Step 4: Evaluate patient for TB disease

- Neither IGRA nor TST testing can distinguish LTBI from active TB disease
- If the IGRA or TST test is positive, symptom screening and chest x-ray are necessary to rule out TB disease



Symptom Screening



Chest X-ray

Step 4 measurement: Number of patients who were ordered a chest x-ray

- For Chest x-ray order, look in "orders" section in EMR

Step 5: Complete CXR and document normal result



[Select]

Normal

Abnormal, consistent w/ TB

Abnormal, not consistent w/ TB

Step 5 measurement: Number of patients with documented normal chest-x ray result

- Chest x-ray results are usually available in the “Imaging”, “Results” or “Radiology” sections of EMR
- Look for LTBI diagnosis in “chronic problem” list in EMR

Step 6: Prescribe LTBI treatment



Step 6 measurement: Number of patients who were prescribed LTBI treatment

- To see if a prescription was issued look for LTBI medication and regimen in “Orders” or “Medications” sections in EMR

Step 7: Document LTBI treatment completion

LTBI Treatment Options

STRONGLY PREFERRED

<p>3 Months</p> <p>Isoniazid (INH) & Rifapentine (RPT)</p> <p>Treatment taken once a week for 3 months.</p> <p>Recommended for adults and children >2 years old, and can be used by people living with HIV.</p>	<p>4 Months</p> <p>Rifampin (RIF)</p> <p>Treatment taken every day for 4 months.</p> <p>Recommended for adults and children of all ages. Not recommended for people living with HIV.</p>	<p>3 Months</p> <p>Isoniazid (INH) & Rifampin (RIF)</p> <p>Treatment is taken every day for 3 months.</p> <p>This is recommended for adults, children of all ages, and can be used by people living with HIV.</p>	<p>6 OR 9 Months</p> <p>Isoniazid (INH)</p> <p>Treatment is taken every day for 6 or 9 months.</p> <p>Recommended for adults and children of all ages. Sometimes recommended for people living with HIV.</p>
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Medication	Reason stopped	Date
RIFAMPIN	Completed	8/9/2021

Step 7 measurement: Number of patients who complete LTBI treatment

- Use pharmacy records or “progress notes”)

Two core LTBI care indicators to measure and monitor

% at risk population that receive a TB test

Measurements needed:

- # patients tested (step 2)
- # patients at risk for TB (step 1)

% with a positive test that complete LTBI treatment

Measurements needed:

- # who complete LTBI treatment (step 7)
- # with positive TB test (step 3)

Summary

Measurement of the LTBI care cascade is possible

- **LTBI care cascade steps:** Standardized approach for measuring testing and treatment practices
- **Best practices:** Available recommendations by leading public health agencies

TAKEAWAYS:

- Being born outside of the U.S. is an important risk factor for LTBI
- Recommend using IGRA blood test (QFT or TSPOT) over TST skin test in BCG vaccinated patients
- Treating LTBI with shorter rifamycin based regimens (3HP or 4R) is preferred as it improves treatment completion

LIVE ACTIVITIES



SCAN TO
PARTICIPATE



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Of the 7 LTBI care cascade steps, which do you feel you could measure currently?

1 Screening for TB risk

2 Completing TB testing

3 Documenting positive tests

4 Evaluating positive persons for TB disease (including chest x-ray)

5 Documenting chest x-ray results

6 Prescribing LTBI treatment

7 Completing LTBI treatment

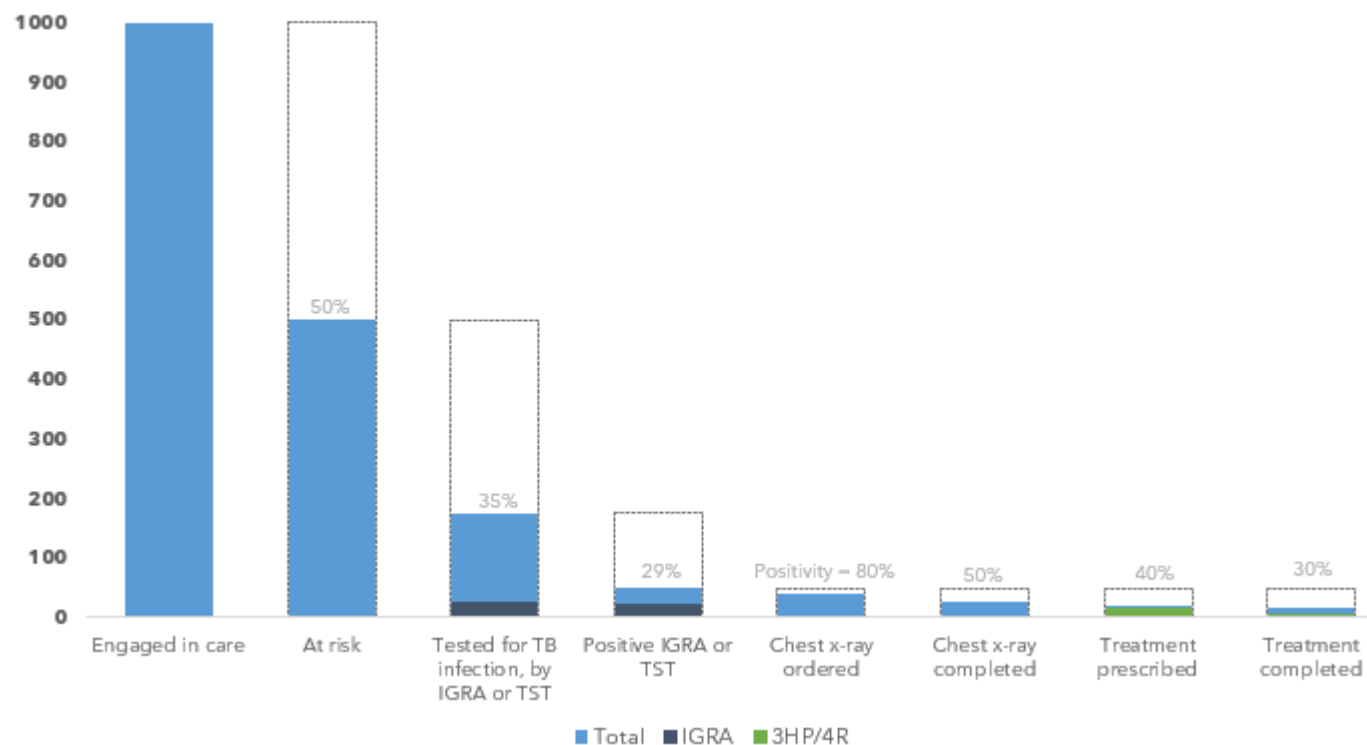
None

LTBI Care Cascade Template

- Template to populate with clinic data to understand current practices and opportunities.

LTBI Care Cascade	Numerator		Denominator		%	Variable Definition	Sample definitions
	Total	IGRA 3HP/4R	Target	Max Outline			
Engaged in care	1000						All, by default
At risk	500		1000	1000	50%		Positive risk factor on risk assessment, within past 2 y
Tested for TB infection, by IGRA or TST	175	25	500	500	35%		TST or IGRA result available, ever
Positive IGRA or TST	50	20	175	175	29%		Positive interpretation, lab result or other discrete field
Chest x-ray ordered	40		50	50	80%		Chest x-ray order present, date >= TST or IGRA date
Chest x-ray completed	25		50	50	50%		Chest x-ray result documented
Treatment prescribed	20		50	50	40%		Isoniazid (only) or Isoniazid + rifapentine or Rifampin (
Treatment completed	15		50	50	30%		Treatment completed, discrete field or date

LTBI Cascade of Care

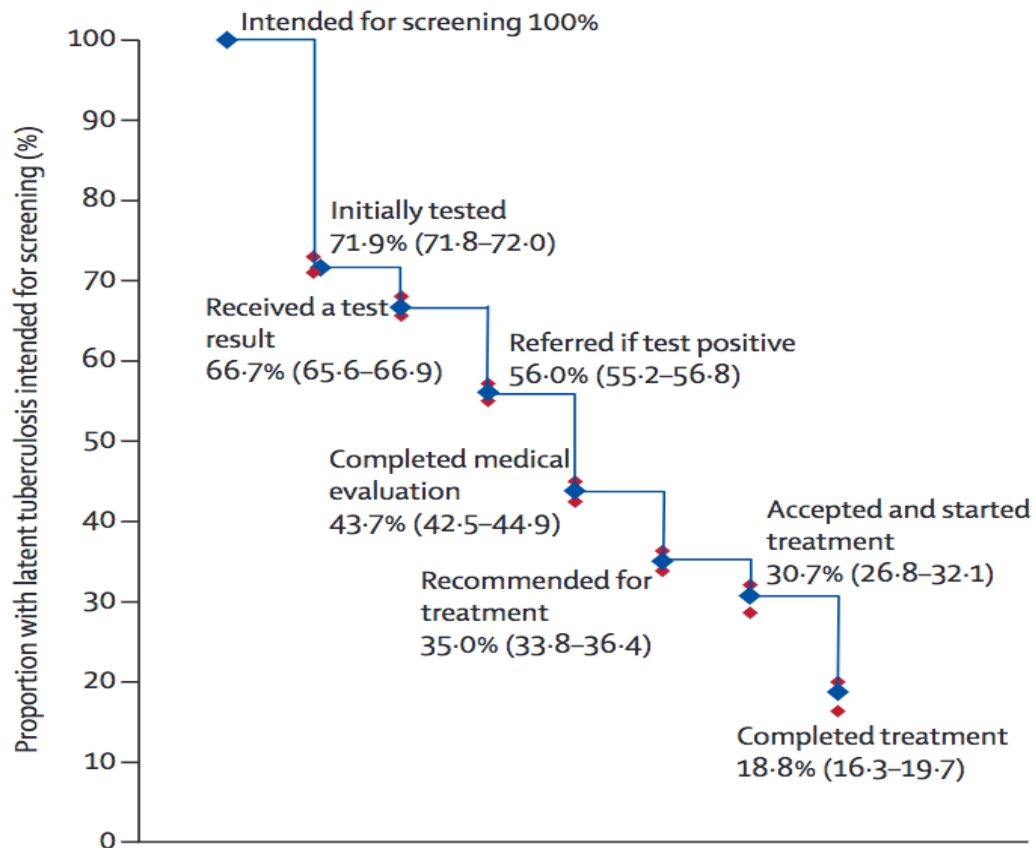


ATTRITION IN THE LTBI CARE CASCADE

Attrition at each step of the LTBI care cascade

Systematic review & meta-analysis

- Reviewed 58 U.S. studies
- Published between 1946-2015 (~750,000 people)
- Looked at % of patients with LTBI completing each step of the cascade
- Identified barriers at the patient, provider and health-system level

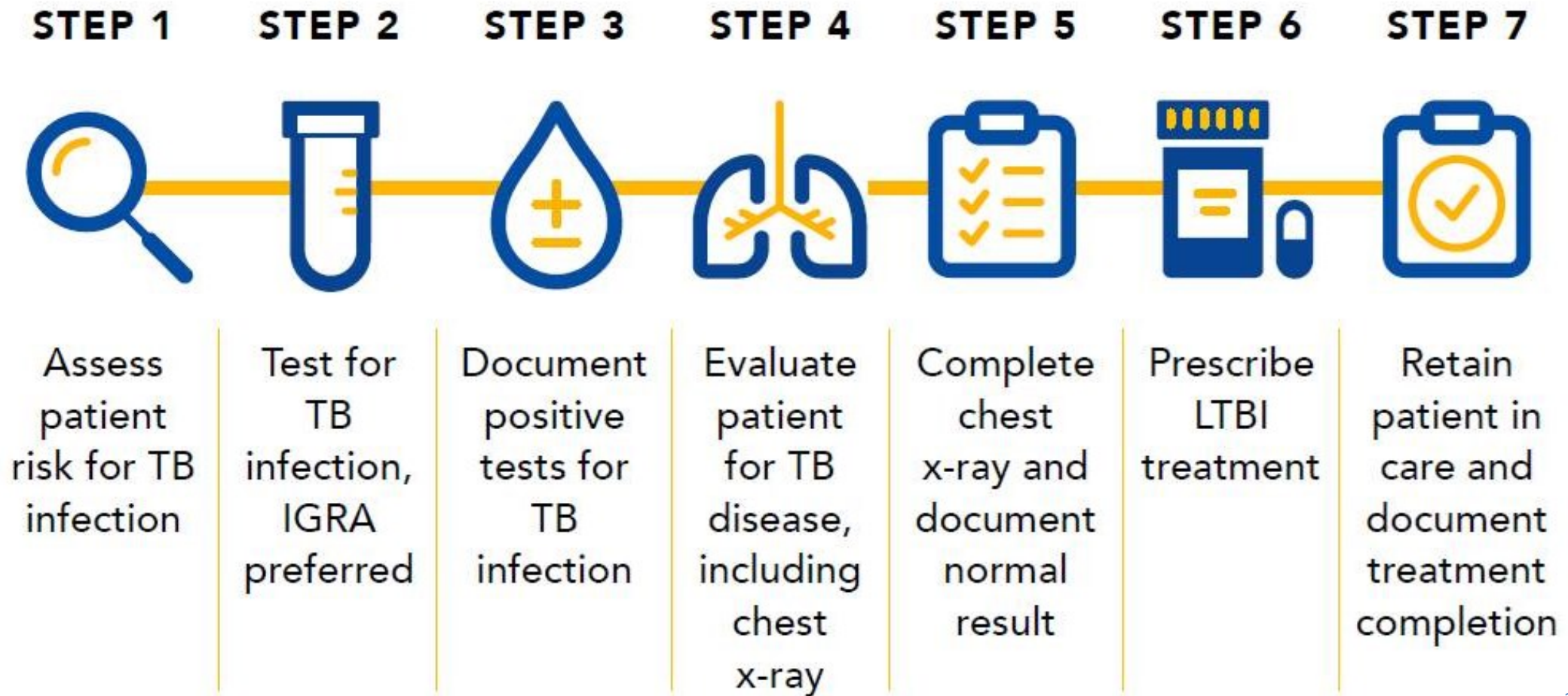


Alsdurf H et al. Lancet ID, 2016

Results:

- Patients lost at each step of the care cascade
- Less than one-quarter of at-risk people with LTBI completed treatment (18.8%)
- Most patients were lost early in the cascade before even being offered treatment

LTBI Care Cascade Steps Overview



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Which step of the care cascade do you expect to encounter the most barriers at your clinic?

1 Screening for TB risk

2 Completing TB testing

3 Documenting positive tests

4 Evaluating positive persons for TB disease (including chest x-ray)

5 Documenting chest x-ray results

6 Prescribing LTBI treatment

7 Completing LTBI treatment

7 Documenting LTBI treatment completion

None

Step 1: Assess patient risk for TB infection

Barrier: Patients are asymptomatic and do not seek testing. Clinic does not collect country of birth and providers may be unaware who is at higher risk and who should be tested for TB infection

Possible solution:

- Health-system change: Clinics could modify EMR to add the California TB Risk Assessment

LTBI testing is recommended if any of the boxes below are checked.

- Birth, travel, or residence** in a country with an elevated TB rate for at least 1 month
 - Includes any country other than the United States, Canada, Australia, New Zealand, or a country in western or northern Europe
 - If resources require prioritization within this group, prioritize patients with at least one medical risk for progression (see the California Adult Tuberculosis Risk Assessment User Guide for this list).
 - Interferon Gamma Release Assay is preferred over Tuberculin Skin Test for non-U.S.-born persons ≥ 2 years old
- Immunosuppression**, current or planned
HIV infection, organ transplant recipient, treated with TNF-alpha antagonist (e.g., infliximab, etanercept, others), steroids (equivalent of prednisone ≥ 15 mg/day for ≥ 1 month) or other immunosuppressive medication
- Close contact** to someone with infectious TB disease during lifetime



TB Risk Assessment past due!

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(Step 1) If your clinic providers do not have time to do TB risk assessments at each well visit, which of the following would be the most feasible for your clinic?

Include it in the new patient intake forms and create a workflow to put into the chart

Have the patient complete a form when they are in the waiting area for their appointment

Have a clinical support staff (eg MA, NA) ask the questions and chart responses when taking blood pressure pre-consult in the room

Automatically send the survey to the patient with appointment reminder for the first well visit

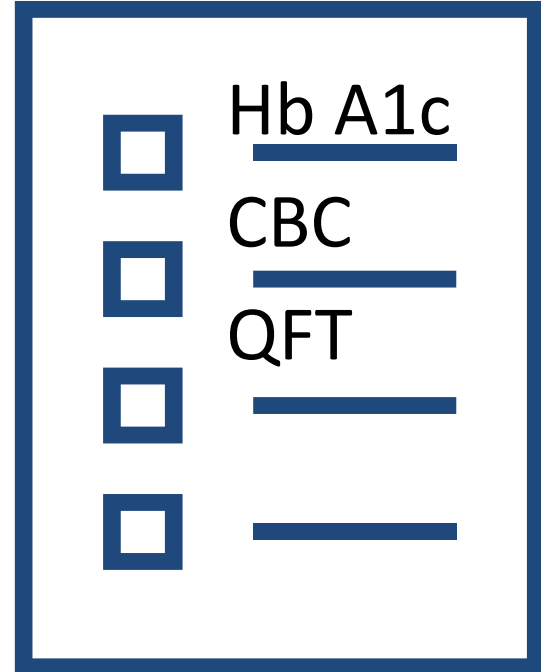
Other (please type into chat)

Step 2: Test for TB infection

Barrier: Providers are busy addressing many primary care concerns, making it challenging to order a TB test for patients at risk

Possible solutions:

- Health-system change: Clinics could incorporate IGRA as a standing order based on risk or add to routine lab order sets
- Patient education: Clinics could display educational materials encouraging patients to talk to their provider about LTBI testing



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(Step 2) Which is the biggest barrier surrounding testing in your clinic?

Knowing who should be tested

Submitting lab orders

Having to refer to another facility

Patients not coming in for testing

Patients not returning for TST reading

Patient's fear of stigma if they are positive

Not being able to get results into patient's EMR easily

Not being able to receive lab results from external facilities

Unsure

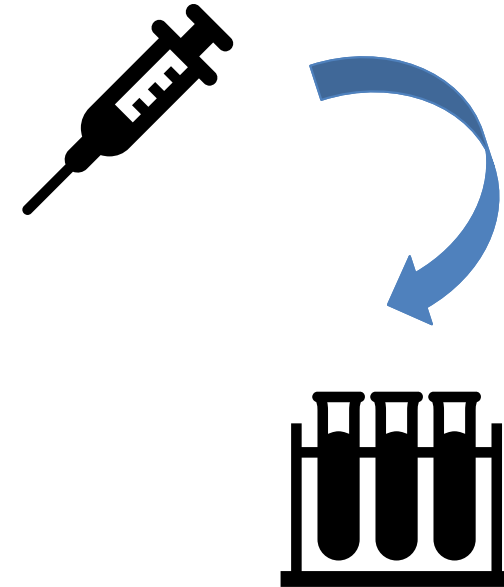
Other (please type into chat)

Step 3: Document positive test for TB infection

Barrier: Clinics do not have access to IGRAs. Patients receive a TST but do not return for the TST test to be read

Possible solutions:

- Health-system change: Clinics could negotiate with lab for reduced price of IGRAs and in-house blood draw





(Step 3) On a scale of 1 to 5 (1 =very easy , 5 =extremely difficult) how would you rank the ease of finding out how many patients under your care are positive for TB testing in the EMR?

1 (very easy)

2 (somewhat easy)

3 (neither easy nor difficult)

4 (somewhat difficult)

5 (extremely difficult)

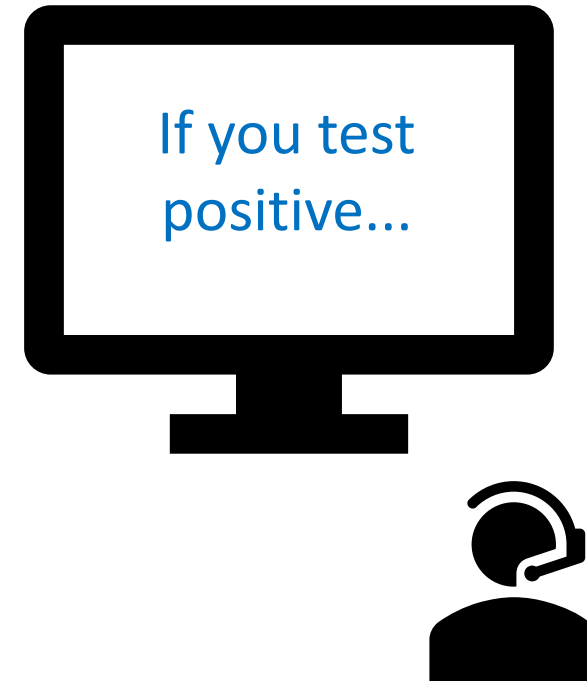
Unsure

Step 4: Evaluate patient for TB disease

Barrier: Patient with a positive LTBI test does not return for further workup; provider does not order a chest x-ray

Possible solutions:

- Patient education: patients could be informed about the importance of ruling out TB disease if positive LTBI test result
- Health-system change: An assigned care coordinator (i.e. nurse) could use an EMR-generated report to follow-up with patients missing a chest x-ray order





(Step 4) What could you do if patients do not come back for a chest x-ray after a positive TB test?

Patient education at the time of test
or when results are communicated

Follow up with patient after a specified
time about chest x-ray completion

Other (please type into chat)

Step 5: Complete CXR and document normal result

Barrier: Patients are referred offsite and CXR results are not documented in EMR

Possible solutions:

- Health-system change: Clinics could work to bring x-ray onsite.
- Clinics could create a standardized protocol to ensure CXR results are added to the EMR and/or clinics could develop a standardized method to document results, using predictive phrases or templates and the ICD-10 code for LTBI (Z22.7)



Diagnosis: LTBI Z22.7

CXR [date] [NORMAL]

[Select]
Normal

Abnormal, consistent w/ TB

Abnormal, not consistent w/ TB

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(Step 5) Which solution would be most impactful at your clinic for improving chest x-ray completion and documentation?

Get funding to establish x-ray services on-site

Hire staff to conduct more x-rays

Get leadership buy-in

Build an EHR feature to document chest-xray results when images are reviewed

A provider and clinic staff education campaign

A patient education campaign

Other (please type into chat)

Step 6: Prescribe LTBI treatment

Barrier: Providers are unfamiliar with newer and shorter LTBI treatments or contraindications to treatment. There may not be a process to follow-up with patients who discontinue or delay treatment (i.e. pregnancy)

Possible solutions:

- Provider Training: Providers can be trained routinely on the efficacy of newer, shorter regimens and drug interactions
- Health-system change: EMR could be modified and provider reference materials could be incorporated into EMR. Clinics could create a standardized protocol for LTBI prescriptions, adverse event and adherence monitoring

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(Step 6) At your clinic, what is the primary barrier to prescribing LTBI treatment?

Providers not aware of importance of LTBI treatment

Providers uncomfortable prescribing LTBI medication

Can't easily identify who to follow up on (test or CXR results hard to flag)

Do not know which billing codes to use to cover treatment

No time to discuss LTBI in consults due to urgent conditions or tight scheduling

No workflow or procedure in place to follow up on LTBI

Cannot access medications due to shortages

Other (please type into chat)

Step 7: Document LTBI treatment completion

Barrier: Treatment completion is not documented in EMR

Possible solution:

- Update clinic workflow: Clinics can develop a standardized protocol to document treatment completion or discontinuation (if pharmacy offsite)
- Health system change: An assigned care coordinator (i.e. nurse) can follow-up with patient or look up prescription data or pharmacy dispensing data (if pharmacy onsite)

(Step 7) What could you do if patients pick up prescriptions elsewhere and you do not know if they are taking meds or completing treatment?

Summary: Barriers

Patients

- Patient feels well and does not seek testing or treatment
- Perception of risk: uncertain and not urgent
- Worried about medicine side effects and may delay treatment

Providers

- Unclear who to test/treat
- Competing priorities
- Unfamiliar with newer and shorter LTBI regimens

Health-System

- Country of origin not routinely collected
- Unable to offer IGRA and chest-x-ray, pharmacy onsite
- Lack of standardized protocol and limited staff to track treatment completion or discontinuation

Summary: Possible solutions

Increase patient education on LTBI

- Public health messaging and campaigns

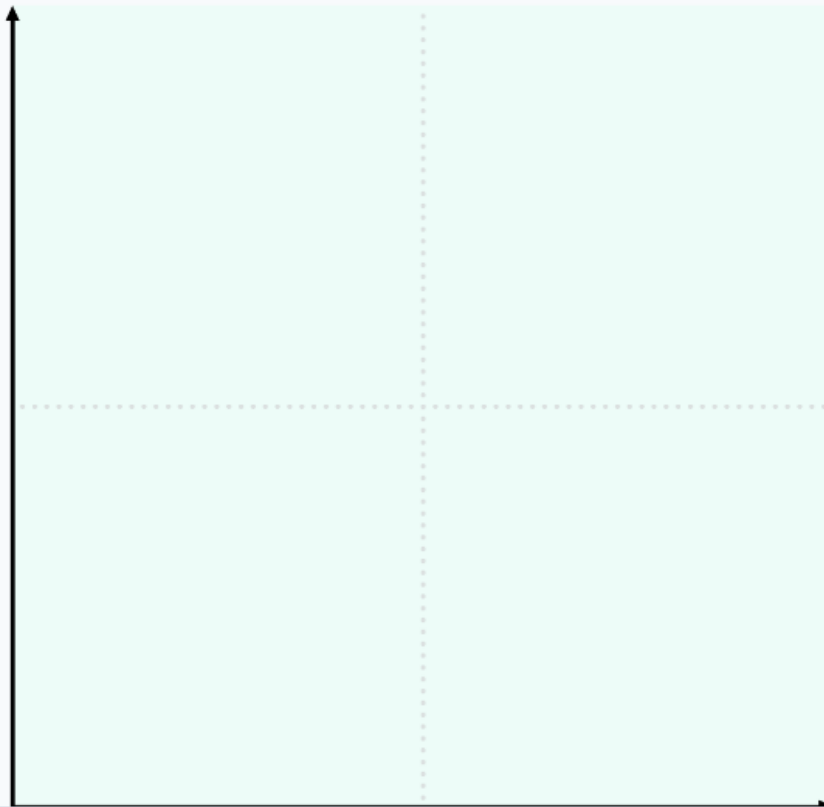
Increase providers' education on LTBI

- Communicate guidelines via ongoing provider training
- Incorporate LTBI reference materials or protocols into clinic work-flow

Reduce burden to providers

- Modify EMR and incorporate standing orders for LTBI tests (based on risk)
- Designate LTBI “care coordinators”

Rate your feelings about measuring an LTBI care cascade at your clinic, in terms of effort required (towards top) and importance (towards right).



Two core LTBI care indicators to measure and monitor

Email TBCB@cdph.ca.gov for the LTBI Care Cascade Template

TB Prevention Guidebook

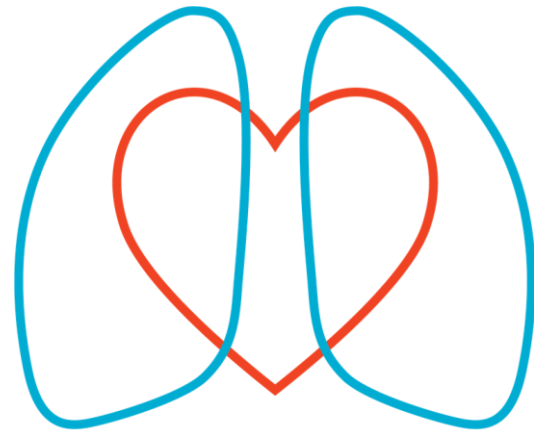


% at risk population that receive an LTBI test

- # patients tested (step 2)
- # patients at risk for TB (step 1)

% with a positive test that complete LTBI treatment

- # who complete LTBI treatment (step 7)
- # with positive TB test (step 3)



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Thank you!

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