

# Contra Costa Health Services Quality Improvement Project: Leveraging the EHR to Increase LTBI Treatment Rates in a County Health Services Delivery System

Erika Jenssen, MPH, Margaret Linde, RN, Cheryl Standley, RN, Louise McNitt, MD, MPH  
Contra Costa Health Services

## INTRODUCTION

In the fall of 2015, Contra Costa Health Services (CCHS) initiated a project to improve latent TB infection (LTBI) treatment rates among CCHS patients due to the recognition that the health system serves a population at high risk for TB disease. CCHS is an integrated health system that provides hospital, outpatient clinical, public health and environmental health services to Contra Costa County. The project is a joint venture between two departments within CCHS: Ambulatory Care Services and Public Health.

When the project began, a nurse case management program already existed to facilitate LTBI treatment of health system clients. Primary care providers (PCPs) could initiate LTBI treatment for their patients, then refer them for nurse case management follow up. These nurse case managers, known as "LTBI nurses", would then contact patients by phone on a regular basis to review medication side effects, evaluate adherence, and order medication refills. Under this system, it was up to the PCP to screen and test their patients, initiate treatment and make the referral.

Anecdotal evidence suggested that many PCPs were uncomfortable with initiating LTBI treatment or were unaware that their patients could be managed by the LTBI nurses while on treatment. There also was no consistent policy for screening and testing of all health system clients. The obstetrics and gynecology department has a policy in place for screening and testing of pregnant patients; pediatric patients are screened using a risk assessment questionnaire at each well-child visit; and patients being admitted to the health system hospital, Contra Costa Regional Medical Center (CCRMC), are screened for TB exposure risk and tested during the admission but there has been no consistent procedure for follow up or risk assessment in the ambulatory care setting.

Just prior to initiating the project, the health system instituted a new policy to encourage the preferential use of Quantiferon (QFT) over the tuberculin skin test (TST). This was done due to the greater ease of performing the QFT, as well as ordering and documenting the test in the electronic health record (EHR). CCHS uses a customized Epic system called "ccLink". ccLink can be accessed by the hospital, ambulatory care centers and the public health department. This set the stage for a project to improve LTBI treatment rates by developing tools in ccLink that could streamline and standardize LTBI screening, testing, referral and follow up.

## PROCEDURES

**Baseline Data:** In order to track the progress of the project, a ccLink report was created to track LTBI testing and treatment rates. The report calculates, over a specified period of time, the number of QFT tests done, the number that are positive, and the number of patients with a positive test started on treatment, grouped by gender, race, and pregnancy status. A separate report was developed to analyze the TB risk factor data for hospitalized patients in order to identify what risk factors were present in the population served by CCHS.

**QFT Result Routing:** All positive QFT results were routed, via ccLink, directly to the LTBI nurse case managers. LTBI nurses could then order chest x-rays, if indicated, and prompt patient's PCPs to initiate therapy.

**Addition of INH/Rifapentine to Nursing Protocol:** The LTBI nurse protocol at the time the project started only allowed for follow up of patients on isoniazid or rifampin. The 12 week INH/rifapentine regimen was added to the nursing protocol to give providers another short-course option for treating their patients.

**Development of Provider Order Panel:** An LTBI order panel was created in ccLink to facilitate LTBI nurse referral and ordering of medications (see Figure 1). The order panel includes the LTBI nurse referral and medication orders for the three different LTBI regimens, allowing busy PCPs to initiate treatment in just a few clicks.

**Documentation and Patient Education:** Nursing documentation and patient education were standardized across clinic sites. A flowsheet for documenting encounters with patients was developed (see Figure 2). Patient education materials in the form of letters that can be generated in ccLink were also developed to make them easily available to all nurses and ensure that all patients receive same information across all clinic sites.

Figure 1. LTBI Order Panel in ccLink

Figure 2. Screen Shot of LTBI Nurse Flowsheet in ccLink

## OUTCOMES

There was an increase in the percent of patients with a positive QFT who were started on LTBI treatment after positive QFT results started being routed to the LTBI nurses (see Figure 3). The average percentage of patients started on treatment from January, 2015, to April, 2016, was 45.7%. After positive QFT results started being routed to the LTBI nurses, the average percentage of patients initiating LTBI treatment increased to 53.8%.

Although a significant number of patients admitted to CCRMC in 2014 (the year before the project started) were identified as having a risk factor for TB exposure, only 28% to 59% of patients in each category were tested (see Table 1). And 50% (347/700) of all those tested had no identified risk factor or were not asked the risk assessment questions. No significant difference in this pattern has been seen in analysis of more recent data.

Figure 3. Percentage of Patients with Positive QFT who Received Medications

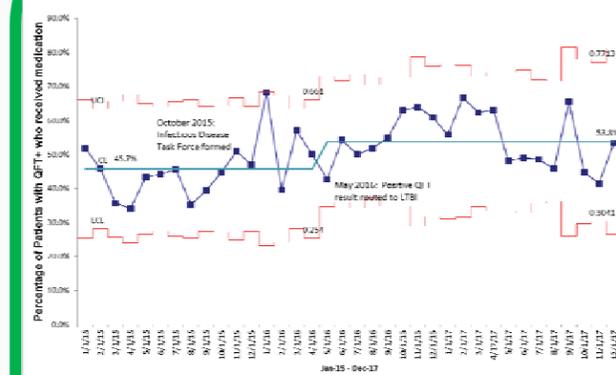


Table 1. Answers from TB Risk Factor Questionnaire administered to all patients admitted to CCRMC Med-Surg between 1/1/14 and 12/31/14, showing how many had a QFT performed and how many of the QFTs performed were positive, excluding patients with a prior positive.

Risk Factor	Admissions	QFTs Conducted	% Tested	Positive Results	% Positive
(No Risk Factors Present)	3,555	268	7.5%	23	8.6%
(Question Not Asked)	1,279	79	6.2%	7	8.9%
History of recent exposure to TB	2	0	0.0%	0	N/A
Homeless	169	76	45.0%	9	11.8%
HIV/AIDS	33	18	54.5%	1	5.6%
Immunocompromise (any reason)	25	7	28.0%	1	14.3%
Recent congregate high risk housing (jail, prison, shelters, group homes, substance abuse treatment centers)	90	53	58.9%	6	11.3%
Recent Immigrant, foreign travel or foreign born	85	48	56.5%	10	20.8%
Substance Abuse (including ETOH)	464	237	51.1%	11	4.6%
<b>Total</b>	<b>5,547</b>	<b>700</b>	<b>12.6%</b>	<b>58</b>	<b>8.3%</b>

## NEXT STEPS

Although an increase was seen in the number of patients with LTBI starting on treatment once the project got underway, there is still room for improvement. The data from hospitalized patients showing the large proportion that were tested despite having no TB risk factors or having no information collected about risk factors raises the concern that providers are not maximally targeting the appropriate patients. Plans to continue the project include:

**Develop a risk factor questionnaire for all ambulatory care patients in ccLink:** all patients would be screened at least once for LTBI risk factors and this information would become a part of their clinical history.

**Develop an LTBI patient registry in ccLink:** this registry is currently being developed in ccLink. It will pull data from the LTBI nurse flowsheet to generate a report that will assist nurses in tracking patients while they are on treatment. The registry will also be used for future data analysis.

**Ongoing provider education:** to promote appropriate screening and testing and use of short-course LTBI treatment regimens.