Update: Tuberculosis in LA County

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Over the past 20 years, there has been an extraordinary decline in the number of new cases of active tuberculosis (TB) disease in Los Angeles County, from 2,198 cases in 1992 to 625 cases in 2012, a 72% decline. Corresponding TB incidence rates have also decreased, from a peak of 25.6 cases per 100,000 population in 1992 to 6.4 in 2012, the lowest rate ever recorded in LA County. This success can be attributed to several factors, including intensive public health case management (including the use of Directly Observed Therapy and incentives to ensure completion of treatment), timely and thorough investigation of contacts to infectious cases, and improved infection control measures.

Remaining Challenges
Despite these gains, major challenges to the control and eventual elimination of TB remain. For example, the rate of decline in foreign-born TB cases lags that of U.S.-born TB cases. From 1992 to 2012, TB cases among U.S.-born persons in LA County decreased by 85%, but only by 64% among the foreign-born. Consequently, foreign-born TB cases represented more than 80% of the total in 2012. In addition, the foreign-born population has a high rate of latent TB infection (estimated at 18%), which represents a large pool from which future cases of active TB disease will develop. Overall, it is estimated that there are more than 750,000 people in Los Angeles living with latent TB infection, including more than 650,000 foreign-born persons.1,2

Aside from the foreign-born population, TB is increasingly concentrated among certain high-risk groups. For example, the homeless are at particu-

Risk factors for M tuberculosis infection

Persons at increased risk* for Mycobacterium tuberculosis infection:
- Close contacts of persons known or suspected to have active tuberculosis
- Foreign-born persons from areas that have a high incidence of active tuberculosis (e.g., Africa, Asia, Eastern Europe, Latin America, and Russia)
- Persons who visit areas with a high prevalence of active tuberculosis, especially if visits are frequent or prolonged
- Residents and employees of congregate settings whose clients are at increased risk for active tuberculosis (e.g., long-term care facilities and homeless shelters)
- Health care workers who serve clients who are at increased risk for active tuberculosis
- Populations defined locally as having an increased incidence of latent M tuberculosis infection or active tuberculosis, possibly including medically underserved, low-income populations, or persons who abuse drugs or alcohol
- Infants, children, and adolescents exposed to adults who are at increased risk for latent M tuberculosis infection or active tuberculosis.

* Persons with these characteristics have an increased risk for M tuberculosis infection compared with persons without these characteristics.
ABF smears of sputa only detect about 66% of culture-positive pulmonary TB disease cases and have poor specificity for TB in settings in which non-tuberculosis mycobacteria are commonly isolated. AFB culture remains the gold standard for diagnosis of TB disease, but it requires 2-6 weeks of incubation to produce results. TB NAATs overcome many of these limitations: They are rapidly available, highly sensitive, and highly specific. Next-generation NAATs, such as the recently FDA-approved Xpert MTB/RIF assay (Cepheid), have a sensitivity of 98%-99% for smear-positive, culture-positive TB. More importantly, for smear-negative, culture-positive TB, they have a sensitivity of 73%-76%, resulting in a 23% increase in TB detection over AFB smear alone. The Xpert MTB/RIF assay also produces results in less than 2 hours and rapidly detects rifampin resistance, a surrogate marker for multidrug-resistant TB.

Because of its superior test characteristics, the Centers for Disease Control and Prevention recommends that TB NAAT be performed on at least 1 respiratory specimen when a diagnosis of active pulmonary TB disease is being considered, regardless of AFB smear status. A recent cost-effectiveness analysis showed that TB NAATs can reduce time to TB diagnosis for culture-positive patients and decrease duration of TB treatment for culture-negative patients without TB. In addition, NAATs reduced utilization of respiratory isolation and decreased the need for additional diagnostic tests (i.e., bronchoscopy, CT scan). Another analysis concluded that TB NAATs would lead to “substantial savings to hospitals...by reducing respiratory isolation usage and overall length of stay.”

New Diagnostics for Latent TB Infection
Fortunately, in addition to new tests for TB disease, the past decade has seen increased availability of newer and more specific diagnostic tests for latent TB infection. Interferon gamma release assays (IGRAs) are blood tests that measure the amount of interferon gamma released from white blood cells when mixed with TB-specific antigens. There are currently 2 FDA-approved IGRAs: QuantiFERON-TB Gold In-Tube (QFT-GIT) and T-SPOT.TB (T-Spot). Revised CDC guidelines in 2010 recommend that an IGRA may be used in place of a Tuberculin Skin Test (TST) in all situations, with certain preferences and considerations.

There are several advantages to using IGRAs in place of TSTs. Perhaps most importantly, IGRAs are not affected by BCG (Bacilli Calmette-Guerin) vaccination; therefore, the IGRAs are the preferred test for latent TB infection among most foreign-born persons. While IGRAs and TSTs generally have comparable sensitivities (70%-90%), the specificity of TST decreases markedly in BCG-vaccinated populations, while IGRAs maintain high specificity. Second, unlike TSTs, IGRAs are not affected by most non-tuberculous mycobacterial infections. Third, while TSTs require a return visit for test interpretation, IGRAs do not. Finally, IGRAs are performed in the laboratory and are not prone to the subjectivity of TST interpretation. Of note, IGRAs, like TSTs, do not differentiate between latent TB infection and active TB disease.

Risk factors for progression of infection to active tuberculosis

Persons at increased risk* for progression of infection to active tuberculosis include the following:
- Persons with human immunodeficiency virus infection
- Infants and children aged <5 years
- Persons who are receiving immunosuppressive therapy, such as tumor necrosis factor-α (TNF-α) antagonists, systemic corticosteroids equivalent to ≥15 mg of prednisone per day, or immune suppressive drug therapy following organ transplantation
- Persons who were recently infected with M tuberculosis (within the past 2 years)
- Persons with a history of untreated or inadequately treated active tuberculosis, including persons with fibrotic changes on chest radiograph consistent with prior active tuberculosis
- Persons with silicosis, diabetes mellitus, chronic renal failure, leukemia, lymphoma, or cancer of the head, neck, or lung
- Persons who have had a gastrectomy or jejunooileal bypass
- Persons who weigh <90% of their ideal body weight
- Cigarette smokers and persons who abuse drugs or alcohol
- Populations defined locally as having an increased incidence of active tuberculosis, possibly including medically underserved or low-income populations

* Persons with these characteristics have an increased risk for progression of infection to active tuberculosis compared with persons without these characteristics.
† Indicates persons at increased risk for a poor outcome (e.g., meningitis, disseminated disease, or death) if active tuberculosis occurs.
Accelerating the Decline

The strategies that have achieved significant reductions in TB morbidity must be continued. These include diagnosis and treatment of TB cases and thorough evaluation and treatment of latent TB infection among contacts. However, to accelerate the decline of TB in LA County, prevention (i.e., identification and treatment of latent TB infection) must be a priority.

Reaching the approximately 750,000 people in LA County who may have latent TB infection can only be accomplished by incorporating targeted testing into the standard practice of primary care providers. The goal of targeted testing is to identify those who will most benefit from testing and treatment for latent TB infection. Patients who should be targeted for screening and treatment are listed in Boxes 1 and 2.

In most foreign-born persons, IGRA should be used for testing for LTBI since it results in a marked reduction in false-positive test results and therefore would be expected to result in a proportionate decrease in unnecessary chest X-rays, clinic visits, and treatment for LTBI with its attendant drug toxicity. In addition, more patients will have a known test result for latent TB infection, since there is no need for a repeat visit. There is also evidence that patients diagnosed with LTBI by an IGRA are more prone to accept their diagnosis than those diagnosed by TST, potentially increasing rates of LTBI treatment initiation and completion.

Although LA County has successfully reduced the incidence of TB over the last two decades, there is still much work to be done if we are to achieve elimination of the disease. The resurgence of TB in the U.S. during the 1980s and 1990s reminds us that we cannot be complacent. TB NAATs and IGRA represent valuable new tools. Their effective use will require ongoing close collaboration between medical providers and the public health spectrum.

More information and resources on tuberculosis are available at www.publichealth.lacounty.gov/tb.
Clinic Fact Sheet on Screening for Lung Cancer
Final Recommendation Statement

The U.S. Preventive Services Task Force (USPSTF) recently released a supplemental fact sheet for primary care clinicians on its final recommendation statement on screening for lung cancer.

This resource is meant to help healthcare professionals talk about lung cancer screening with their patients and determine if screening is appropriate, as well as help clinicians understand how to implement this recommendation. It is important to help patients understand if they are at high risk for lung cancer and if they should consider a screening.

The entire fact sheet “Talking With Your Patients About Screening for Lung Cancer” is printed on the following pages.

The USPSTF final recommendation on screening for lung cancer, which was released in December 2013, is an update to its 2004 recommendation.

The revised recommendation states “The USPSTF recommends annual screening for lung cancer with low-dose computed tomography in adults ages 55 to 80 years who have a 30 pack-year smoking history and currently smoke or have quit within the past 15 years. Screening should be discontinued once a person has not smoked for 15 years or develops a health problem that substantially limits life expectancy or the ability or willingness to have curative lung surgery.”

### 48th Educational Conference of the California Tuberculosis Controllers Association

**Navigating Our Path to TB Elimination: Challenges and Solutions**

The California Endowment/Center for Healthy Communities
1000 N. Alameda St., Los Angeles, CA 90012

**Wednesday, April 23**

**TB Controllers Meeting** (Open to all)
- 9 am-3 pm: Meeting hosted by the LA County Department Public Health’s Tuberculosis Control Program
- 3:30 pm-5 pm: Radiology case studies session

For cost and registration, go to [www.ctca.org](http://www.ctca.org)

**Thursday, April 24**

**CTCA Education Conference**
- Keynote Speaker: Randall Reeves, MD, MSc, Medical Director, Denver Metro TB Control Program, on “Addressing the Challenges of TB Elimination Among Foreign-Born Persons”
- Plenary Speaker: Barbara Seaworth, MD, Medical Director, Heartland National TB Center on “TB and Diabetes”

For cost and registration, go to [www.ctca.org](http://www.ctca.org)

**Friday, April 25**

**Curry International TB Center Training Course**
Mechanisms for Effective TB Case Management: Working with the Laboratory
No cost. Register at [www.currytbcenter.ucsf.edu](http://www.currytbcenter.ucsf.edu)

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**SAVE THE DATE**
April 23-25, 2014

**CTCA Education Conference**

**Monday, April 21**

**Plenary Session**
- Keynote Speaker: Dr. Mark Chitnis, Medical Director, CTCA Education Conference, on “TB: Challenges and Opportunities for 2014”

**Tuesday, April 22**

**The JBSI Program**
- Keynote Speaker: Dr. Michael D. Jernigan, Director, CDC Tuberculosis Program, on “New Era of TB Control: The JBSI Program”
- Plenary Speaker: Dr. Robert G. Matheny, Executive Director of the California Tuberculosis Controllers Association, on “How TB Controllers Are Revising Our Path to Elimination”

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After conducting a comprehensive review of the medical evidence, including the results of a recent large clinical trial, on December 31, 2013, the U.S. Preventive Services Task Force (USPSTF or Task Force) issued a final recommendation statement on screening for lung cancer. This fact sheet will help you implement a lung cancer screening program and discuss lung cancer screening with your patients.

The Task Force Recommendation on Lung Cancer Screening With Low-Dose Computed Tomography

The USPSTF recommends annual screening for lung cancer with low-dose computed tomography (LDCT) in persons age 55 through 80 years with a 30 pack year history of smoking who are currently smoking or have quit within the past 15 years. Screening should be discontinued once the individual has not smoked for 15 years or develops a health problem significantly limiting either life expectancy or ability or willingness to undergo curative lung surgery.

Population

This recommendation applies to people age 55 through 80 years with no signs or symptoms of lung cancer who are current smokers or have quit within the past 15 years. Within this population, the magnitude of the benefit for each individual depends on that person's risk for lung cancer; people who are at the highest risk for lung cancer are most likely to benefit from screening.

Evidence Base for Screening

This recommendation is based largely on the National Lung Screening Trial (NLST), the largest randomized controlled trial to date with more than 50,000 patients. The Task Force used modeling based on the NLST data to assess the benefits and harms of screening programs for varying populations. Based on the trial data and the model, the Task Force concluded that a reasonable balance of benefits and harms is achieved by screening people from age 55 through 80 years old who are current smokers or have quit within the past 15 years.

Expected Benefits of Screening

Evidence suggests that this screening program would detect approximately one half of lung cancer cases at an early stage, at which surgery with curative intent is an option. Right now, approximately 160,000 people die from lung cancer each year. If the Task Force’s recommendation were to be fully implemented, it could save about 20,000 lives each year.

Potential Harms of Screening

Lung cancer screening has significant harms, most notably the risks of false-positive tests and incidental findings that lead to a cascade of testing and treatment that may result in significant harms, including having unnecessary invasive procedures. Evidence shows that if 1 million people were screened, approximately 250,000 people would experience a false positive result. Although most of the false positive results can be resolved with further imaging, results from the NLST suggest that about 8,000 people will need an invasive procedure to prove that the finding on the screening test is not cancer. Overdiagnosis and radiation exposure are also potential harms.
Maximizing the Benefits of a Lung Cancer Screening Program

We recognize that the body of evidence on the effectiveness of screening for lung cancer will continue to evolve, which may help the Task Force further clarify its recommendation in the future. What we know now, is that lung cancer screening can save lives and prevent deaths from lung cancer, and that the benefits of screening can be maximized if health care professionals consider the following:

1. **Limiting screening to people who are at high risk.** Based on current evidence, the Task Force recommends that screening be limited to people between 55 and 80 years old, who have a 30-pack-year history of smoking and are current smokers or quit less than 15 years ago. While future research will likely help the USPSTF refine the criteria for screening, possibly removing some people now considered at increased risk and including others who are not currently included, at this time health care professionals should limit screening to those currently defined as being at high risk. Additionally, most trials, including the NLST, only enrolled people who were generally healthy. The benefit of screening may be significantly less in people with serious medical problems and there is no benefit in screening someone for whom treatment is not an option.

2. **Accurately interpreting the images produced from the LDCT.** The evidence on the benefits of lung cancer screening comes from research conducted in large academic medical centers with expertise in diagnosing and managing lung cancer. Those benefits are most likely to be duplicated in clinical settings that have high rates of diagnostic accuracy using LDCT.

3. **Resolving most false-positive results without invasive procedures.** False-positive results occur in a substantial proportion of people screened; 95 percent of all positive screens do not lead to a diagnosis of cancer. To help reduce the harms associated with false-positive test results, health care professionals could consider resolving false-positives with further imaging and watching lesions over time rather than with invasive procedures.

Most importantly, the Task Force recommends that everyone enrolled in a lung cancer screening program receive interventions to help them stop smoking. Most lung cancer deaths cannot be prevented by screening, and smoking cessation remains a critical way to help reduce lung cancer diagnoses and deaths.

**Talking With Your Patients About Lung Cancer Screening**

Explain the facts about lung cancer and who the evidence shows will receive most benefit from screening. Use this fact sheet or the information sources below. Discuss the benefits and harms of not only LDCT screening itself, but of potential subsequent diagnostic testing and treatment. Help your patient understand if he or she is at high risk for lung cancer and should consider getting screened.

Lung cancer screening is most beneficial for those at high risk. Use the scenarios below to help explain to a given patient why he or she may or may not benefit from screening.

<table>
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<tr>
<th>Patient Scenarios</th>
<th>Discussion Points</th>
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<tr>
<td><strong>Patient Scenario #1</strong>&lt;br&gt;Current smokers between age 55 and 80 years who have smoked 30 pack-years and request lung cancer screening.</td>
<td>Discuss the importance of smoking cessation, and that quitting smoking is the most effective way not only to reduce the risk for lung cancer, but also for a whole range of serious medical conditions, and recommend that they quit. Explain that the screening test can prevent some, but not all lung cancer deaths, and screening is not a substitute for quitting smoking. The CT scan may find things that require further testing, and 95 percent of what is found is not lung cancer; thus screening is likely to result in additional testing and possible overdiagnosis. Emphasize that there’s a significant risk for these patients to develop lung cancer and that most people who are diagnosed with lung cancer die from the disease. This screening program can provide some hope for preventing death from lung cancer by detecting some of these lesions at a point when they are most treatable.</td>
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Patient Scenarios | Discussion Points
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**Patient Scenario #2**
Patients who are just outside of the screening criteria (too old, too young, don’t have long enough smoking history, or quit smoking more than 15 years ago) and ask about screening. | Emphasize that they do not currently fit the screening criteria, and not all people who may be at risk for lung cancer will benefit from screening because there are potential harms, including false-positives and exposure to radiation. 

**For patients who are still smokers:** State that the most important thing they can do to prevent lung cancer is to quit smoking, which is more effective than screening. For every year they don’t smoke, their risk for lung cancer (and for a variety of other diseases, as well) goes down. 

**For patients who have already quit:** Let them know that quitting is the most important thing he or she can do to prevent lung cancer and their risk for developing lung cancer goes down every year since they quit smoking. Explain that ordering the screening test will likely do more harm than good because they is are not considered high risk. 

Explain that there is not enough evidence to recommend screening in people at lower risk for lung cancer and explain the potential harms of screening.

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**Patient Scenario #3**
Patients who fit all screening criteria (age, current or recent former smoker, smoking history) but have a significant co-morbid condition. | Explain that while lung cancer screening has been demonstrated to be effective in some people, there are risks associated with false positive tests and treatment, such as invasive procedures and surgeries. Because of their co-morbid condition, they may be at greater risk for harms from any invasive procedures resulting from the screening tests. 

If they are current smokers, discuss the importance of smoking cessation, and that quitting smoking is the most effective way to reduce the risk for lung cancer (and for a variety of other diseases, as well), and recommend that they quit.

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**The Bottom Line**
Screening high-risk patients for lung cancer will save lives. In order to maintain a favorable balance of benefits versus harms, it must be limited to those at high risk and implemented carefully. 

The most important way to prevent lung cancer (and for a variety of other diseases, as well) is to help smokers stop smoking and protect non-smokers from being exposed to tobacco smoke.

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**Additional Information for Health Care Professionals**
- Final recommendation
- Final evidence report
- Modeling Study
- Patient and Physician Guide: National Lung Screening Trial (NLST) (National Cancer Institute)

**Additional Information for Patients**
- Task Force Consumer Fact Sheet
- SmokeFree.gov (U.S. Department of Health and Human Services)
- What You Need to Know About™ Lung Cancer (National Cancer Institute)
- Lung Cancer (MedlinePlus)
- Lung Cancer Screening (National Cancer Institute)
- Patient and Physician Guide: National Lung Screening Trial (National Cancer Institute)
Upcoming Training

**Immunization Training Resources for Clinicians**
The Los Angeles County Department of Public Health Immunization Program, the California Department of Public Health, the CDC and other entities offer a variety of web-based and in-person immunization training programs for clinicians and staff. Some programs offer CMEs. Visit [www.publichealth.lacounty.gov/ip/trainconf.htm](http://www.publichealth.lacounty.gov/ip/trainconf.htm).

**Immunization Skills Training for Medical Assistants**
The Immunization Skills Institute is a 4-hour course that trains medical assistants on safe, effective, and caring immunization skills. Visit [www.publichealth.lacounty.gov/ip](http://www.publichealth.lacounty.gov/ip) or call (213) 351-7800.

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**Index of Disease Reporting Forms**

All case reporting forms from the LA County Department of Public Health are available by telephone or Internet.

- **Reportable Diseases & Conditions**
  - **Confidential Morbidity Report**
    - Morbidity Unit (888) 397-3993
  - **Sexually Transmitted Disease**
    - Confidential Morbidity Report (213) 744-3070
  - **Adult HIV/AIDS Case Report Form**
    - For patients over 13 years of age taken over the phone.
  - **Pediatric HIV/AIDS Case Report Form**
    - For patients less than 13 years of age at time of diagnosis

- **Tuberculosis**
  - **Tuberculosis Suspects & Cases**
    - Confidential Morbidity Report (213) 745-0800
    - [www.publichealth.lacounty.gov/tb/forms/Tuberculosis.htm](http://www.publichealth.lacounty.gov/tb/forms/Tuberculosis.htm)
  - **Latent Tuberculosis Testing**
  - **Respiratory Tuberculosis**
    - [www.publichealth.lacounty.gov/tb/forms/Tuberculosis_ReportCase.htm#RespiratoryTuberculosis](http://www.publichealth.lacounty.gov/tb/forms/Tuberculosis_ReportCase.htm#RespiratoryTuberculosis)

- **Sexually Transmitted Disease**
  - **Confidential Morbidity Report**
    - (213) 744-3070

- **Acute Morbidity Unit**
  - **Confidential Morbidity Report**

- **Veterinary**
  - **Animal Diseases and Syndrome Report Form**
    - [www.publichealth.lacounty.gov/vet/forms/Animal_Diseases_and_Syndrome_ReportForm.pdf](http://www.publichealth.lacounty.gov/vet/forms/Animal_Diseases_and_Syndrome_ReportForm.pdf)
  - **Animal Bite Report Form**
    - [www.publichealth.lacounty.gov/vet/forms/Animal_Bite_ReportForm.pdf](http://www.publichealth.lacounty.gov/vet/forms/Animal_Bite_ReportForm.pdf)
  - **Animal Health Investigation Unit**
    - [www.publichealth.lacounty.gov/vet/forms/Animal_Health_Investigation_Unit_ReportForm.pdf](http://www.publichealth.lacounty.gov/vet/forms/Animal_Health_Investigation_Unit_ReportForm.pdf)

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