AHCA/NCAL Infection Preventionist Hot Topic Brief

Tuberculosis

The Kansas Department of Health and Environment (KDHE), with support from the Centers for Disease Control and Prevention (CDC), and local health departments, have been responding to an outbreak of tuberculosis (TB) in the Kansas City, Kan. metro area since January 2024. As of January 31, 2025, there have been 67 confirmed cases of active TB including 60 in Wyandotte County and 7 in Johnson County. Of these cases, 35 have completed treatment and are considered cured, while 30 are currently under treatment. Most of those under treatment are no longer considered infectious to others. There are 2 deaths reported with this outbreak.

There are also 79 confirmed latent TB cases, including 77 in Wyandotte County and 2 in Johnson County. Those with latent TB are not infectious to others. 31 of these individuals have completed treatment, while 28 are currently under treatment.

While there is a low risk of infection to the public, KDHE is working diligently to ensure that all individuals that are possibly at risk receive appropriate testing and treatment.

This is a good time to update our knowledge of TB, how it is spread, and what we can do in the realm of infection prevention to ensure that it does not happen in our community.



Tuberculosis by Nick Youngson CC BY-SA 3.0 Pix4free.org

BACKGROUND AND SCOPE

Tuberculosis (TB) is caused by a bacteria called *Mycobacterium tuberculosis*. TB infections can remain dormant or latent in a person for many years. When active TB disease develops it can infect any part of the body, including the kidney, spine, and brain. When active TB disease develops in the lungs, upper airways or wounds it is contagious.

TB spreads through the air from a person with active TB disease to others. TB germs enter the air when a person with infectious TB disease of the lungs or throat coughs, speaks, or sings. People nearby may breathe in these germs and become infected. When that occurs, blood cells in the lung take up the germ allowing it to move through the blood to other parts of the body.









Not everyone infected with TB germs becomes sick. As a result, two TB-related conditions exist: latent TB infection (or inactive TB) and active TB disease. If treated properly the goal is curative. If not treated properly, TB disease can be fatal.

Those at risk for developing active TB disease include, but are not limited to:

- Recent infection, within 2 years
- Diabetes
- Smoking
- History of TB with inadequate or incomplete treatment
- People who were born in or who frequently travel to countries where TB disease is common, including Mexico, the Philippines, Vietnam, India, China, Haiti, Guatemala, and other countries with high rates of TB
- People with HIV

There are two forms of TB, and it is important to understand the difference.

	LATENT TB	ACTIVE TB
Description	In most people who breathe in TB germs and become infected, the body can fight the TB germs to stop them from growing. The TB germs become inactive, but they remain in the body and can become active at a later date.	People who develop active TB in their lungs or throat can be infectious and pass TB germs to their family, friends, and others around them. If TB settles in other parts of their body, such as kidneys or spine, they are not infectious.
Presence of Symptoms	They have no symptoms, and they do not feel sick.	 Will have symptoms that include: A bad cough that lasts 3 weeks or longer Pain in the chest Coughing up blood or sputum Weakness/fatigue Weight loss No appetite Chills/fever Night sweats









	LATENT TB	ACTIVE TB
Medication Use	May develop TB disease if they do not receive treatment.	They will need to take several medications a day when they start treatment.
	Treatment will consist of 1 medication for a period prescribed by the physician, but usually for only 3–4 months, depending on the medication used.	This can be for up to 6 months to over 2 years for drug resistant infections
	Treatment for latent TB is essential in controlling TB in the United States because it substantially reduces the risk that it will progress to active TB.	
Can they spread TB?	No, they CANNOT spread TB to others	Yes, the physician will tell them when they are no longer contagious to others.
Will they test positive?	Will have a positive TB blood test or skin test	Will have a positive TB blood test or skin test. Clinical criteria like a chest X-ray is used to diagnose active TB disease.
What type of precautions are indicated?	None	Residents with active pulmonary TB need to be in a special AIIR room and on airborne precautions until their treating physician has determined they are no longer contagious.

The public health department oversees the treatment of active TB disease, which is mandatory. Therapy for active TB disease must be directly observed, meaning that a health department worker or a nurse must see the patient take their medicine. This is to ensure that treatment is completed. The cost of medication is often covered by the health department.

Treatment for latent TB is encouraged but is not mandatory. Decisions about whether to treat latent TB should be made by the treating physician and the patient considering the patient's health status and their ability to complete treatment. Inadequate or incomplete treatment of latent TB can lead to drug-resistant TB.

The most important lesson learned through this is -TB is totally treatable, if the medication is taken as directed by the treating physician.

The goal of treatment for TB is curative. Therefore, following the physician's orders for 6–9 months may seem like forever; however, it will provide you with a chance of never having to deal with TB again in your lifetime.









SUGGESTIONS FOR PRACTICE AND RESOURCES

Testing

Each state has their own <u>**TB control program**</u>, which you are obligated to follow.

In general, there are **3 steps** that need to be followed when hiring new staff in the long-term care settings. They include:

- 1. Baseline Individual TB Risk Assessment
- 2. A symptom screen for TB that is repeated annually
- 3. A test for TB, which could be done via a skin test or a blood test.



TB Blood Tests

There are **2 blood tests** approved by the U.S. Food and Drug Administration and are available in the U.S. They are:

- QuantiFERON-TB Gold Plus
- T-SPOT.TB test (T-spot)

The **blood test** can be done at the health department, a doctor's office, or at an occupational health office. This requires only one lab draw, or a "one and done" testing.

- Positive blood test means that you have been infected with TB germs. Additional testing is necessary to determine whether you have latent or active TB.
- Negative blood test means that your blood did not react to the test, and you likely do not have TB infections.

These blood tests are the recommended TB test for:

- People who have received the bacille Calmette-Guerin (BCG) TB vaccine
- People who have a difficult time returning for a second appointment to look for a reaction to the TB skin test

TB Skin Test

A TB skin test is generally done by the nursing department upon hire. It is also known as the <u>Mantoux skin test</u>. This is done intradermally, injections done to deep or too shallow can result in incorrect results. Tuberculin purified protein derivative (PPD) is injected intradermally, a small, raised wheal should form, which generally absorbs rather quickly. After 2–3 days (48–72 hours), this must be read. If there is an induration, which is a hard, raised, area at the site of injection, it will be considered positive. No induration will be considered negative. Some duration after a TB skin test, gently palpate the injection site with your fingertips to locate the edges of the firm, raised area (induration), and measure the widest diameter of that area across the forearm using a ruler, ensuring you









Mantoux Tuberculin Skin Test



ADMINISTRATION

To determine if a skin test should be administered, conduct a risk assessment for each patient that takes into consideration recent exposure to TB disease, clinical conditions that increase the risk for TB disease if infected, and the program's capacity to deliver treatment for latent TB infection.

Locate and clean injection site



- 2 to 4 inches below elbow joint
 - Place forearm palm side up on a firm, well lit surface
 - Select an area free of barriers to placing and reading (e.g., scars, sores)
 - Clean the area with an alcohol swab

2 Prepare syringe



- Check expiration date on vial and ensure vial contains tuberculin (5 TU per 0.1 ml) • Use a single-dose tuberculin
- inch, 27-gauge needle with a short bevel Fill the syringe with 0.1 ml

syringe with a 1/4 - to 1/2-

of tuberculin

3 Inject tuberculin





Insert slowly, bevel up, at a 5- to 15-degree angle







seen just below skin





If not, repeat test at a site at least 2

Record information

1. Inspect

Record all information required for documentation by your institution (e.g., date and time of test administration, injection site location, lot number of tuberculin)

RFADING

The skin test should be read between 48 and 72 hours after administration. A patient who does not return within 72 hours will probably need to be rescheduled for another skin test.



2 Palpate induration



Use fingertips to find margins of induration

3 Mark induration



• Use fingertip as a guide for marking widest edges of induration across forearm

4. Measure induration (not erythema)



Place "0" ruler line inside left dot edge

Read ruler line inside right dot edge (use lower measurement if between two gradations on mm scale)

5 Record measurement of induration in mm

- If no induration, record as 0 mm
- Do not record as "positive" or "negative"
- Only record measurement in millimeters (mm)

INTERPRETATION

Skin test interpretation depends on two factors:

- Measurement in millimeters (mm) of the induration
- Person's risk of being infected with TB and progression to disease if infected

The three cut points below should be used to determine whether the skin test reaction is positive. A person with a positive reaction should be referred for a medical evaluation for latent TB infection and appropriate follow-up and treatment if necessary. A measurement of 0 mm or a measurement below the defined cut point for each category is considered negative.

Induration of ≥5 mm is considered positive in

- People living with HIV
- Recent contacts of people with infectious TB disease
- People who have fibrotic changes on a chest radiograph
- Patients with organ transplants
- Other immunosuppressed patients (e.g., patients on prolonged therapy with corticosteroids \geq 15 mg per day of prednisone or those taking TNF- α antagonists)

Induration of ≥10 mm is considered positive in

- People born in countries where TB disease is common, including Mexico, the Philippines, Vietnam, India, China, Haiti, and Guatemala
- People who misuse drugs and alcohol
- People who live or work in high-risk congregate settings (e.g., nursing homes, homeless shelters, or correctional facilities)*
- Mycobacteriology laboratory workers
- People with certain medical conditions that place them at high risk for TB (e.g.,silicosis, diabetes mellitus, severe kidney disease, certain types of cancer, or certain intestinal conditions)
- Children younger than 5 years of age
- Infants, children, and adolescents exposed to adults in high-risk categories

Induration of ≥15 mm is considered positive in

- People with no known risk factors for TB
- * For employees who are otherwise at low risk for TB and who are tested as part of an infection control screening program at the start of employment, a reaction of \geq 15 mm is considered positive. Some health care workers participating in an infection control screening program may have had an induration > 0 mm that was considered negative at baseline. If these health care workers have an increase in induration size upon subsequent testing, they should be referred for further evaluation.

All U.S. health care employees should have baseline TB screening, including an individual risk assessment which is necessary for interpreting any test result. For the risk assessment form see: https://www.cdc.gov/tb/topic/infectioncontrol/ pdf/healthCareSettings-assessment.pdf.

For additional information see: Tuberculosis Screening, Testing, and Treatment of U.S. Health Care Personnel: Recommendations from the National Tuberculosis Controllers Association and CDC, 2019 at https://www.cdc.gov/ mmwr/volumes/68/wr/mm6819a3.htm.

Note: Reliable administration and reading of the tuberculin skin test involves standardization of procedures, training, supervision, and practice. Always follow your institution's policies and procedures regarding infection control, evaluation, and referral. Also remember to provide culturally appropriate patient education before and after administration, reading, and interpretation of the skin test.

For more information on tuberculosis, visit www.cdc.gov/tb.

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are only measuring the induration and not the redness. CDC has a video on administering the Tb skin test with a demonstration at 17:00 min into the YouTube video on how to read the results and avoid making mistakes.

- Positive skin test means that the person has been infected with TB germs. Additional testing will need to be done to determine if it is latent or active TB*.
- Negative skin test means that there was no reaction to the test, and that latent or active TB is not likely.

If a test is positive, the staff will need to be seen by a physician to be cleared to work.

Each facility is required to have a Tuberculosis Control Program in place that is in line with the state specific Tuberculosis Control Program for long-term care.

John Hopkin's states, "The U.S. is seen as a global leader in the fight against tuberculosis, leading the charge in research and development. Even among other Western countries, TB rates in the U.S. have historically been very low. Yet for two years in a row now, rates of tuberculosis in the U.S. have increased." An outbreak, as seen in Kansas, is a real signal of deteriorating capacity. Therefore, we must all be aware, and vigilant in our efforts to recognize and reduce incidents of TB in our facilities.

Preparation

If your state requires it, including TB in infection control plan can be a first step in preparing for any potential exposure.

TB_Exposure_Plan.pdf

Appendix B. Tuberculosis (TB) risk assessment worksheet

Resources

CDC. 2021. Questions and Answers about Tuberculosis. Retrieved from https://www.cdc.gov/tb/media/Question_Answers_About_TB_English.pdf CDC. 2023. Clinical Testing Guidance for Tuberculosis: Health Care Personnel. https://www.cdc.gov/tb/healthcare-settings/hcp/screening-testing/?CDC_AAref_Val=https://www.cdc.gov/tb/healthcarepersonnel-fag.htm

CDC. 2021. Core Curriculum on Tuberculosis: What the Clinician Should Know. Retrieved from core-curriculum-on-tuberculosis.html

CDC. 2023. What you Need to Know about Tuberculosis. Retrieved from https://www.cdc.gov/tb/communication-resources/tuberculosis-fact-sheet.html

CDC. 2024. TB Programs. https://www.cdc.gov/tb/php/tb-programs/index.html

CDC YouTube video on administering and reading the skin TB test at https://www.youtube.com/watch?v=Qzt-qGgglo0

John Hopkins. August 2022. The Other Pandemic: Why TB Deserves Your Attention. Retrieved from https://publichealth.jhu.edu/2022/the-other-pandemic-why-tb-deserves-your-attention

John Hopkins. February 2025. What the Tuberculosis Outbreak in Kansas Means for Public Health. Retrieved from https://publichealth.jhu.edu/2025/tuberculosis-in-kansas-the-larger-picture

Kansas Department of Health and Environment. January 2025. Current Tuberculosis Outbreak in Kansas City, Kansas Metro. Retrieved from https://www.coronavirus.kdheks.gov/CivicAlerts.aspx?AID=1436

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