NGN NCLEX 2026 · VISUAL STUDY LIBRARY

INFECTIOUS DISEASE · DIAGNOSTICS

Tuberculin *Skin Test*

Mantoux / PPD · Two-Step · IGRA

A screening test for *exposure* to *Mycobacterium tuberculosis* — not a test for active disease. Reads **induration** (the bump), never erythema. Thresholds shift with the patient's risk profile, and the boards love to make you forget that.

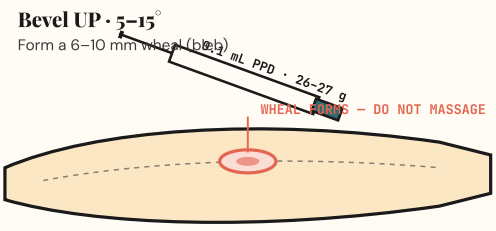
Route: Intradermal (ID)	Dose: 0.1 mL PPD	Read: 48–72 hrs	Measure: Induration in mm

0.1 mL	26–27g	5–15°	48–72 h
PPD DOSE, INTRADERMAL	NEEDLE GAUGE · ⅜–½ IN	BEVEL UP, ALMOST FLAT	WINDOW TO READ RESULT

1 Definition & Overview

WHAT IS THE MANTOUX TEST, REALLY?

- The **Mantoux tuberculin skin test (TST)** is an **intradermal injection of 0.1 mL of PPD** (purified protein derivative) into the **inner aspect of the forearm**, read at **48–72 hours**.
- A positive result means the body has **encountered TB antigen at some point** — it does **NOT** distinguish latent infection from active disease.
- Always follow a positive TST with a **chest x-ray ± sputum for AFB ×3** to rule in/out active pulmonary TB.
- Two alternatives exist: **IGRA blood tests** (QuantiFERON-TB Gold, T-SPOT.TB) — preferred for BCG-vaccinated clients and those unlikely to return for the read.



INTRADERMAL · INNER FOREARM · RAISED WHEAL

Note from Claude: Your uploaded project notes don't yet contain a TB skin test deck — content below is drawn from standard NGN NCLEX 2026 references (Saunders, ATI, Lippincott, CDC) and matches your existing library style.

2

The Immune Logic of the Test

WHY A BUMP MEANS EXPOSURE

The TST exploits a **Type IV (delayed) cell-mediated hypersensitivity reaction**. Memory T-cells from prior TB exposure recognize the injected protein and orchestrate localized inflammation — that firm bump (induration) is the antigen recall in action.

STEP 01

Inject PPD

0.1 mL of *M. tuberculosis* proteins placed into the dermis.

STEP 02

Antigen Presented

Local dendritic cells process & present PPD to T-cells.

STEP 03

Memory T-Cells Activate

If previously exposed, sensitized Th1 cells respond.

STEP 04

Cytokines Recruit

IFN-γ & TNF draw macrophages → local inflammation.

STEP 05

Induration Forms

Firm, palpable bump peaks at 48–72 hours.

KEY POINT

Induration ≠ Redness

Erythema is irrelevant. Only the **palpable, raised area** is measured in millimeters, across the forearm (transverse to long axis).

KEY POINT

Exposure ≠ Active TB

A positive TST tells you the immune system has seen TB. It cannot tell you if the organism is dormant (LTBI) or actively replicating in the lungs.

3 Procedure: Administration & Reading

EXACTLY WHAT THE NURSE DOES

Administering the PPD

- ✓ Verify no **prior positive TST** (do not repeat in known positives — risk of severe local reaction).
- ✓ Use a **tuberculin syringe**, **26–27 gauge**, **¼–½ inch** needle.
- ✓ Cleanse **inner (volar) forearm**, 2–4 inches below the antecubital space, with alcohol; allow to dry.
- ✓ Insert **bevel UP** at a **5–15° angle**, nearly parallel to skin.
- ✓ Inject **0.1 mL** intradermally — a **6–10 mm wheal (bleb)** should form.
- ✓ **Do not massage**; do not cover with a bandage. Circle the site with a pen.
- ✓ Document site, lot #, expiration, and time. Educate to return in **48–72 hours**.

Reading the Result

- ✓ Read between **48 and 72 hours** post-injection. Earlier or later readings are unreliable.
- ✓ **Palpate** the area with fingertips — locate the **edges of the induration**, not the redness.
- ✓ Measure the **transverse diameter** (across the long axis of the forearm) in **millimeters**.
- ✓ Record the **exact mm of induration** — never just "positive" or "negative."
- ✓ If **no induration**, document as **"0 mm."**
- ✓ Interpret using **risk-based thresholds** (see Section 4).

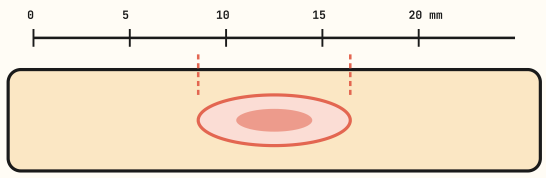
Two-Step Testing (Booster Phenomenon)

Used for **baseline testing in healthcare workers** and others who will be tested repeatedly. In older adults or remote exposures, a first TST may be falsely negative because immune memory has waned — but it *boosts* the memory response, so a later positive could be misread as a new conversion.

STEP	ACTION	IF RESULT
Step 1	Place PPD & read at 48–72 hrs	If negative → proceed to Step 2 in 1–3 weeks
Step 2	Place second PPD & read at 48–72 hrs	If positive → boosted reaction (old infection), **not** a recent conversion

4 Reading the Result · Risk-Based Thresholds

A "POSITIVE" DEPENDS ENTIRELY ON WHO THE PATIENT IS



Measure ACROSS the arm →
Palpate the firm edge. Ignore the pink halo.

INDURATION = PALPABLE, RAISED, FIRM AREA

≥ 5 mm POSITIVE if highest-risk

HIV-positive · recent **close contact** with active TB case · **fibrotic changes** on prior CXR consistent with healed TB · **organ transplant** recipient · **immunosuppressed** (prednisone ≥15 mg/day > 1 mo, TNF-α blockers, chemotherapy).

≥ 10 mm POSITIVE if moderate-risk

Recent **immigrants** (< 5 yrs) from high-prevalence countries · **IV drug users** · **healthcare workers** · **residents/employees** of congregate settings (prisons, shelters, LTC) · mycobacteriology lab staff · **children < 4 yrs** · diabetes, silicosis, CKD, leukemia, lymphoma, low body weight.

≥ 15 mm POSITIVE for everyone else

Persons with **no known risk factors**. Routine testing of low-risk individuals is generally discouraged.

- **Positive TST = exposure only.** Next step is **chest x-ray** to evaluate for active disease.
- **Negative TST does not rule out TB** in immunocompromised clients — they may be anergic.
- **BCG vaccine history** can cause false-positive TST. **IGRA** (blood test) is preferred — BCG does not affect it.

5 Priority Nursing Interventions

BEFORE · DURING · AFTER

BEFORE

Assess & Screen

- Ask about **previous positive TST** — do NOT retest.
- Ask about **BCG vaccination** (consider IGRA instead).
- Screen for **active TB symptoms**: cough > 3 wks, night sweats, hemoptysis, weight loss.
- Check **PPD expiration date** and protect vial from light.
- Verify **informed consent** per facility policy.

DURING

Administer Correctly

- **Intradermal** only — never SQ or IM.
- Inner forearm, **bevel up, 5–15°**.
- Form a **6–10 mm wheal**; if no wheal forms, the dose was too deep — repeat at a site ≥ 2 inches away.
- **No alcohol wipe** over the site after injection (don't disturb the wheal).
- Document site & teach return date.

AFTER

Read & Act

- Read at **48–72 hours**; **palpate** induration.
- Document **exact mm**; interpret per risk category.
- If positive → notify HCP; anticipate **chest x-ray ± sputum AFB × 3**.
- If active TB suspected → **airborne isolation**, **N95**, negative-pressure room.
- Report positive cases per **state public health** requirements.

6 Pharmacology Connection

PPD & THE DRUGS THAT FOLLOW A POSITIVE TEST

Purified Protein Derivative (PPD / Tubersol)

DIAGNOSTIC ANTIGEN

MECHANISM
Contains inactivated TB protein fragments. Triggers Type IV hypersensitivity in sensitized hosts.

SIDE EFFECTS
Mild itching/induration at site; rare ulceration; rare anaphylaxis in highly sensitized patients.

NURSING
Refrigerate (2–8 °C). Protect from light. Use within 30 min of drawing up.

CONTRAINDICATIONS
Known prior positive reaction; severe blistering reaction history; active TB.

Isoniazid (INH)

FIRST-LINE · LTBI

USE
Latent TB infection (LTBI) — 6–9 months. Active TB regimen (RIPE).

ADVERSE
Hepatotoxicity; **peripheral neuropathy** (give **vitamin B6 / pyridoxine**).

TEACHING
Empty stomach. Avoid alcohol. Report jaundice, dark urine, RUQ pain.

MONITOR
Baseline & periodic **LFTs**.

Rifampin

FIRST-LINE · ACTIVE TB

USE
Component of RIPE for active TB.

ADVERSE
Orange-red body fluids (urine, sweat, tears — harmless). Hepatotoxicity. Stains soft contacts.

TEACHING
Empty stomach. Reduces effectiveness of **OCPs** — use backup contraception.

MONITOR
LFTs; many drug interactions (CYP450 inducer).

Pyrazinamide (PZA)

FIRST-LINE · ACTIVE TB

USE
Component of RIPE — first 2 months.

ADVERSE
Hepatotoxicity; **hyperuricemia** → gout flare; photosensitivity.

TEACHING
Drink plenty of water; protect skin from sun.

MONITOR
Uric acid, LFTs.

Ethambutol

FIRST-LINE · ACTIVE TB

USE
Component of RIPE.

ADVERSE
Optic neuritis → red-green color blindness, decreased visual acuity.

TEACHING
Report any vision change immediately.

MONITOR
Baseline & monthly **visual acuity** and color discrimination.

7

NCLEX Test Traps ⚠

WHERE STUDENTS LOSE POINTS

TRAP	RIGHT ANSWER
Measuring the area of **redness** on the forearm and recording it as a positive result.	Measure **induration only** — the firm, palpable, raised area. Redness alone is meaningless.
Recording a 12 mm reading as "positive" without considering risk category.	"Positive" is **risk-based**: ≥5 mm in HIV/immunosuppressed, ≥10 mm in healthcare workers, ≥15 mm in low-risk clients.
Concluding active pulmonary TB from a positive PPD alone.	A positive TST signals **exposure**. Confirm with **chest x-ray** and **sputum for AFB × 3**.
Reading the test at 24 hours because the patient is leaving town.	Read between **48–72 hours**. Earlier or later readings are unreliable. If patient cannot return, use **IGRA**.
Repeating a TST on a client who states a prior positive result.	Do **NOT** retest known positives — risk of severe local reaction. Obtain **chest x-ray** instead.
Assuming a BCG-vaccinated client with a positive PPD has TB exposure.	BCG can cause **false-positive TST**. Use **IGRA** — it is unaffected by BCG.
Giving the PPD **subcutaneously** — "It's just a little injection."	**Intradermal only**. SQ administration invalidates the test; document and re-administer at a new site.

8 Patient & Family Education

WHAT TO TEACH BEFORE THEY LEAVE THE CLINIC

About the Test Itself

- ✓ **Return in 48–72 hours** to have the test read — not earlier, not later.
- ✓ Do **not scratch, rub, cover, or apply lotion** to the site.
- ✓ The site may itch or look slightly red — that is normal.
- ✓ Showering and bathing are fine; just **don't scrub** the area.
- ✓ Notify the clinic if the site **blisters, ulcerates, or develops severe swelling**.

If the Result Is Positive

- ✓ Positive means your body has been **exposed** to TB — it does **not necessarily** mean you are sick or contagious.
- ✓ You will need a **chest x-ray** and possibly sputum testing.
- ✓ If treatment is prescribed (INH or RIPE), **take every dose as directed**, often for 6–9 months.
- ✓ Avoid **alcohol** during treatment due to liver risk.
- ✓ Report **yellow eyes/skin, dark urine, vision changes, numbness/tingling**.
- ✓ You will **never need another TST** — future screening uses chest x-ray or IGRA.

9

Memory Boosters

MNEMONICS & PATTERN RECOGNITION

5 · 10 · 15

The 5 · 10 · 15 Ladder

- **5 mm — Sick (HIV) & Close contacts.** Immune systems can't mount a big reaction, so a small bump means a lot.
- **10 mm — Special populations.** Immigrants, IV drug users, healthcare workers, kids < 4, chronic disease (DM, CKD, silicosis).
- **15 mm — Standard risk.** Healthy adults with no known exposure.

RIPE

RIPE — Active TB First-Line Drugs

- **R**ifampin — orange body fluids · CYP inducer · empty stomach
- **I**soniazid (INH) — neuropathy → give B6 · hepatotoxic · empty stomach
- **P**yrazinamide — hyperuricemia (gout) · hepatotoxic · photosensitivity
- **E**thambutol — **E**yes (optic neuritis · color blindness)

PPD

PPD — Procedure Memory

- **P**oint of needle UP (bevel up, 5–15°)
- **P**alpate induration — not the redness
- **D**ocument exact **mm** and read between 48–72 hrs

BCG

BCG = "Blame Childhood Globally"

- BCG vaccine is given in many countries outside the US to prevent severe childhood TB.
- Can cause **false-positive PPD** for years afterward.
- **Switch to IGRA** (QuantiFERON) — it doesn't react to BCG.

10

NCJMM Clinical Judgment Scenario

SIX-STEP FRAMEWORK · NGN STYLE

Case: A 34-year-old nurse who recently emigrated from the Philippines is hired at a new hospital. She received the **BCG vaccine** as a child. As part of pre-employment screening, a two-step TST is placed. At 72 hours, the nurse reads **12 mm of induration**. The new hire reports a 4-week dry cough she attributes to allergies, denies fever, but notes she has lost 6 lb in the last month "without trying." Vital signs: T 99.1 °F · HR 96 · RR 20 · SpO_2 97 % · BP 118/74.

1

Recognize Cues

Relevant: 12 mm induration · BCG history · healthcare worker · 4-week cough · 6-lb unintentional weight loss · low-grade temp · recent immigrant from high-prevalence country.

2

Analyze Cues

12 mm is positive for healthcare workers and recent immigrants (≥10 mm threshold). BCG can cause false positives, but the cough + weight loss + low-grade temp raise concern for **active pulmonary TB**, not merely vaccine reaction.

3

Prioritize Hypotheses

#1 Active pulmonary TB (symptoms + positive TST + risk profile) > LTBI > BCG-related false positive. The active-TB hypothesis drives the safety response.

4

Generate Solutions

Place in **airborne isolation** with negative-pressure room · staff wear **N95** · obtain **chest x-ray** · collect **sputum for AFB × 3** (early-morning specimens) · consider **IGRA** to bypass BCG confounder · notify employee health and public health.

5

Take Action

FIRST: Implement airborne precautions and don N95 before further patient contact. Then notify the HCP, arrange chest x-ray, and initiate sputum collection. Hold from patient-care duties until active TB is ruled out.

6

Evaluate Outcomes

Chest x-ray clear + 3 negative AFB sputum smears → likely LTBI → start **INH** (with B6) for 6–9 months and remove isolation. Positive CXR/AFB → confirmed active TB → begin **RIPE**, maintain isolation until smear-negative ×3 and clinically improving.

11

Quick Comparisons

TST VS IGRA · LTBI VS ACTIVE TB

	TST (MANTOUX/PPD)	IGRA (QUANTIFERON · T-SPOT)
Type	Intradermal skin test	Blood test (single venipuncture)
Visits	Two (placement + reading 48–72 hrs)	One
BCG interference	YES — false positives	NO — unaffected by BCG
Best for	Children, screening programs	BCG-vaccinated, unlikely-to-return clients
Result	mm of induration	Positive / Negative / Indeterminate

	LATENT TB INFECTION (LTBI)	ACTIVE TB DISEASE
Symptoms	None	Cough > 3 wks, fever, night sweats, weight loss, hemoptysis
TST / IGRA	Positive	Usually positive (may be negative if anergic)
Chest X-Ray	Normal (may show old granuloma)	Infiltrates, cavities, often upper lobes
Sputum AFB	Negative	Positive
Infectious?	NO	YES — airborne isolation, N95
Treatment	INH 6–9 months (or alternatives)	RIPE × 2 mo, then INH + Rifampin × 4 mo