Disclaimer

This presentation is produced by McGill International TB Centre solely for educational purposes. This presentation content is intended to train health care providers to perform Tuberculin skin testing. It is not proposed for use by non-healthcare professionals.

This presentation is protected by copyright law. It is a free presentation for clinical use only and is not to be sold or marketed under any circumstances. McGill International TB Centre does not approve or endorse any products, services or methods showed in this presentation, and the presentation should not be cited in any way that would imply such approval or endorsement.

The McGill International TB centre is not responsible for any misuse, injury and/or damage to persons or property or financial obligations that occur due to the use of the information provided. By using this presentation, you acknowledge and agree to the terms of this disclaimer policy. We reserve the right to modify these terms and policies.
Training slides for Tuberculin Skin Testing (TST)

Saeedeh Moayedi-Nia, Chantal Valiquette, & Dr. Dick Menzies

McGill International TB Centre

Thanks to Linette McElroy Hawkes for helping to develop slides
Purpose of the TST:

- To identify who is infected with M. tuberculosis
- Helpful to predict future risk of developing active TB and to identify who will benefit from treatment of latent TB infection (LTBI)

Definitions:

- Tuberculin Skin Test (TST): any test where tuberculin is injected into the skin (Heaf, Tine, Mantoux)
- Mantoux: the WHO recommended technique or method of administering a TST
- Purified Protein Derivative (PPD): the tuberculin material that is injected into the skin when doing a TST
Contraindications for TST

**DO NOT** administer TST if:

- Prior **DOCUMENTED** positive TST
- Prior **SEVERE** reaction or **ALLERGY** to TST (necrosis, blistering, ulceration)
- Prior **DOCUMENTED** treatment for active TB
- Prior **DOCUMENTED** treatment for Latent TB Infection
- Aged under 6 months
- Vaccinated with live virus vaccine such as the measles, mumps, and rubella (MMR) vaccine **within past month** (can interfere with cell mediated response to PPD)
**TST can be given to:**

- Persons with prior BCG vaccination
- Persons with a common cold or **OTHER MILD ILLNESS**
- Women who are pregnant or breastfeeding
- Persons immunized with **ANY vaccine ON THE SAME DAY** as the TST.
- Persons immunized with inactivated vaccines such as Hepatitis A vaccines
- Persons who report an **UNDOCUMENTED** prior positive TST (unless blistered), or undocumented prior treatment for latent TB infection
- Persons taking any medications (including systemic corticosteroids)
Check Tuberculin solution in vial and confirm the following:

- Product name
- Expiry date
- Discard date – **discard if vial has been in use for more than 1 month**
- Label newly opened vials with discard date (**1 month after opening**) (L) - the LOT # (E) - expiration date
Tuberculin material (PPD)  
Storage & Handling

– Store in a refrigerator at +2ºC to +8ºC (+35ºF to +46ºF) and protect from direct light e.g. sunlight. Do Not freeze

– Use a refrigerator appropriate for storing tuberculin, vaccines, and medications (not one used to store food)

– Monitor refrigerator temperature

– Place large container of water in the refrigerator to keep temperature stable when the refrigerator is opened.
Tuberculin (PPD) Storage & Handling

⚠️ Discard tuberculin that has been exposed to freezing temperatures (0°C = 32°F or lower) or has been stored above 8°C (46°F)

⚠️ When opening a new vial of tuberculin, label the vial with the date after which it should be discarded (one month after opening)

⚠️ Dispose of opened vials with no discard date

⚠️ **DO NOT** store tuberculin in the door of the refrigerator

⚠️ **DO NOT** store with other vials that could be mistaken for tuberculin
Transport of Tuberculin (PPD)

- Use insulated storage containers with ice packs to transport PPD

⚠️ **DO NOT place tuberculin vials in direct contact with ice packs**

- Maintain tuberculin between +2°C and +8°C (+35°F to +46°F) during transportation
- Keep the storage container closed as much as possible
- Keep a thermometer in the storage container with the tuberculin
- Check temperatures periodically to ensure cold chain is maintained
- Keep a log of which tuberculin lots were taken to which site
Preparing to give a TST

Supplies you will need:

• Tuberculin material (PPD)
• Sterile 1ml TB syringe (27G x 1/2 needle)

⚠️ Do not use Insulin syringe. Any other 1 ml syringe could be used.

• Disposable plastic gloves
• Alcohol Swabs
• Gauze- if necessary, to remove any blood after injection
• Sharps disposal container
Administering the TST
A. PREPARE TUBERCULIN MATERIAL (1/2)

- Clean the top of the vial with alcohol swab; allow to air dry

⚠️ **DO NOT** use water to clean the top of the Vial

- Draw up slightly more than **0.1 mL** of Tuberculin material into the syringe

- Hold syringe upright, tap lightly to remove air bubbles- 0.1 ml of material should remain in the syringe
A. PREPARE TUBERCULIN MATERIAL (2/2)

- Return tuberculin to the refrigerator immediately (within 2 minutes)

Note: Draw up the solution no more than 20 minutes before administering the injection - Carefully recap the syringe after preparation and protect it from direct light

⚠️ **DO NOT** preload syringes for later use as the potency of the tuberculin is diminished if in the syringe for more than 30 minutes

⚠️ **DO NOT** prepare the syringe in front of children or people who do not like needles
B. Prepare the Patient

- Confirm with the patient that there are no contraindications to TST
- Seat patient comfortably and support their arm on a desk or a chair arm pad
- Children must be seated on a parent’s lap and be held by parent quite securely, with elbow supported
- Explain the procedure
- Ensure the patient knows **they must return to have the test read 48 hours later** (72 hours is acceptable if the patient can’t come at 48 hours)

⚠️ **DO NOT** hold or support the patient's arm during injection.

⚠️ **DO NOT** use any anesthetic creams on the TST site (can interfere with response to tuberculin)
C. Prepare the Injection Site

- Use the inner aspect of either forearm
- Select a spot approximately one third of the way down the arm from the elbow

- If neither forearm is suitable, use the outside of the forearm or upper arm, and record the location used in the patient's chart

⚠️ AVOID abrasions, swelling, lesions, rashes, burns, eczema
D. Injecting the Tuberculin (1/2)

1) Clean the injection site with an alcohol swab and let dry

⚠️ **Do not** use water to clean the injection site

2) Position the needle bevel up
   (the bevel is the hole)

3) Hold the skin of the inner aspect of the forearm taut

4) Lay needle almost flat on the arm

5) Insert needle intra-dermally. Stop once the bevel of the needle is covered

⚠️ **DO NOT** aspirate
D. Injecting the Tuberculin (2/2)

6) Inject Tuberculin **slowly** (If tuberculin leaks during injection, move needle slightly further into skin and continue)

7) After injection wait for 2-3 seconds then withdraw the syringe gently

8) Do not recap the used needle and dispose of it in a sharps container

9) Make sure patient is feeling well after the injection. Vasovagal reactions (fainting) can occur
Troubleshooting

• NO wheal or wheal less than 6 mm:
  – Tuberculin material injected too deeply
  – Excessive leakage of tuberculin
  – Poor skin turgor (e.g. the elderly)

• If there is no wheal **BUT** you are confident TST was given properly – there is no need to repeat it

• If you think the injection was not given properly – then repeat the TST immediately. Use the other forearm or inject at least 5 cm from original site.

• **If the test has to be repeated**, record the problem with the initial injection, and where the first and second injections were given and note which one should be read.

6 mm bleb and no leakage
Post TST Site Care

⚠️ **DO NOT** rub the injection site
⚠️ **DO NOT** cover site with a bandage
⚠️ **DO NOT** mark site with a pen/marker

Tell the patient:

– Normal activities can continue (shower/bath)

⚠️ **Do not** scratch the site

⚠️ **Do not** apply any anti-itch creams to site

– If there is itching or swelling, apply cold compresses

– Remind the patient that if the reaction is severe (with blistering), they should keep it clean and cover it with dry and clean bandage to prevent scratching

– **Remind the patient they need to come back in 48 hours (2 days) to have the TST read!**
Include the following information:

- Name & signature of person administering test
- Dose of Tuberculin administered
- Date & time TST administered
- Site of injection (e.g. right forearm)
- Any leakage
- Tuberculin manufacturer
- Lot number & expiration date
Reading the TST
Reading a TST

- Must be read by a trained professional at the TB clinic

⚠️ **DO NOT accept self-read TST results (even for healthcare workers!)**
- TST must be read **48 hours** after it is given. (72 hours is acceptable if the patient cannot come at 48 hours)
- **If not read within a maximum of 72 hours**, repeat TST on other arm

What should be measured?

**A: Induration** is a palpable, raised, hardened area or swelling; mark and measure induration

**B: Erythema** is redness; **DO NOT** mark or measure erythema.

If patient has a severe reaction with blistering, keep it clean and cover it with dry and clean bandage to prevent scratching. **Record in their medical chart (log book) that a severe reaction occurred. **DO NOT apply any cream**
How to read a TST?(1/2)

You will need to be in a well-lit area with a ballpoint pen and a ruler (with millimetre demarcations). A caliper-type ruler is recommended but a small flexible ruler can be used.

A. Seat patient comfortably with the arm supported. Patient’s arm should be resting on a flat surface, slightly flexed at elbow

B. Explain the procedure

C. Palpate TST site with your fingertips (induration might not be visible)
D. If induration is present, move the tip of a ballpoint pen at a 45° angle laterally toward the edges of the induration. Stop when you feel the edge of the induration and the pen won’t move forward anymore. (Ballpoint Pen Method)

E. Repeat on the opposite side of the induration.
F. Measuring a TST reaction

Measure distance between pen marks (diameter of induration) across the forearm – the transverse diameter

53 mm, caliper-type ruler  15 mm, caliper-type ruler  20 mm, caliper-type ruler

G. Document TST Reading

- Name & signature of person reading test
- Date & time test read
- Result of induration (in mm), and specify if any blistering
- Provide a record of the TST result to the patient
Do Not pull skin during marking or measurement.

Do Not hold or support the patient's arm during reading.
Do Not move the tip of pen at a 90° angle laterally toward the edges of induration.

Do Not mark the induration parallel to the long axis of the forearm.
**Do Not** use the middle of the ruler to make the measurement.

**Do Not** measure the induration parallel to the long axis of the forearm. (Measure the **TRANSVERSE** diameter).
Referral for medical evaluation
Referral Criteria – who needs medical evaluation to exclude active TB, and consider LTBI treatment

- This depends on the clinical situation and your national guidelines. Check your national guidelines, and insert as appropriate here.

- As examples only:
  - Usually, for contacts, the criterion is 5mm
  - Usually, for HIV infected, the criterion is 5mm
  - For many other indications – 10mm

For more information about interpretation of a positive TST, you can look at the online TST interpreter: http://www.tstin3d.com
Referral for Medical Evaluation

• Tell the patient:
  – Where they need to go for appointment (give them date, time and address in writing)
  – What to bring (e.g. health card, proof of insurance)
  – Fasting is **NOT** required
  – Cost and method of payment; if there is no cost to the patient, emphasize this - it could improve attendance!

• Give to the referral institution:
  – Information about all the contacts who are referred (names, test results and contact info: addresses, cell phone numbers)
  – Ensure that the referral institution has a mechanism to contact patients who do not keep their appointments.
Acknowledgments

Special thanks to:

Zhiyi Lan
Federica Fregonese
Olivia Oxlade
Linette McElroy
Mei-Xin Ly