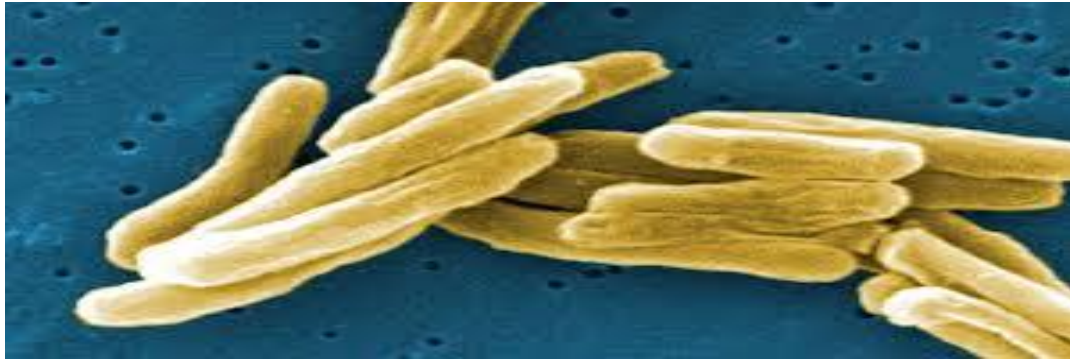




ESTADO LIBRE ASOCIADO DE
PUERTO RICO
Departamento de Salud



Certification Course

Tuberculin administration and test lecture



Estado Libre Asociado de Puerto Rico
Departamento de Salud
Secretaría Auxiliar para Reglamentación y
Acreditación de Facilidades de Salud
(SARAFS)

Who can obtain this certification?

WARNING

This course would be only given to:

- **Registered Nurses (associate or bachelor's)**
- **Doctor who have current professional license to date in Puerto Rico (Could be provisional or permanent)**

Students without a **professional license** in the fields above, practical nurses, phlebotomists or others health **professionals** are not eligible to take this course.

Who is required to obtain this certification?

This certification is required by the administrative order 201 for graduated nurses and doctors that are **administering** or reading tuberculin tests for health certificates.

Graduated nurses or doctors making this tuberculin test for other purposes should be properly trained by their employers, but should not have to complete this certification. This staff could complete the modules by auto-study in the web page of the Tuberculin Program.

Format of the Certification Course

The Certification **course** for the Administration and Lecture of the Tuberculine test is divided in two parts:

- **Part I: Theory Basis**

*Is completed through this module by auto-study. The participant should obtain **an** 80% or more in the **Theory Basis Test** for it to be able to continue to the next part. This test should be offer the same day as the Part II of the **course**, before the begining of the same.*

- **Part II: Execution and Practice**

Is completed through the classroom course of 4 hours. The participant should complete the practical exercises and obtain 80% or more in the test execution to be able to recieve this certification.

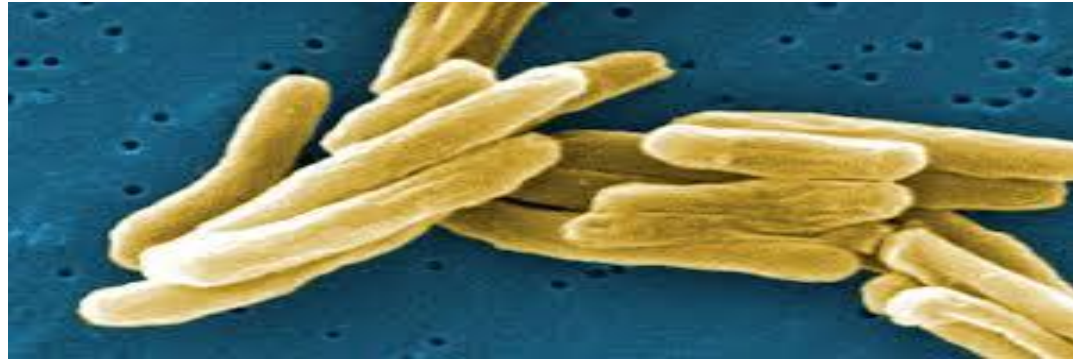
Requiemment to obtain the Certification

- Get 80% or more in the Theory Test
- Attend all components of Part II: Implementation and Practice
- Fill practical administration and reading exercises.
- Get 80% or better in the Test Run

Participants who meet these requirements will receive their certificates via email from the Program for the Control of Tuberculosis



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Part I: Theory Basis Certification Course Reading Administration and the Tuberculin test

Objectives

On completion of the course, participants will:

- Explain the basics about their patients Tuberculosis
- Identify groups at higher risk of becoming infected and developing active TB disease
- Understanding how to store and handle the PPD
- Understanding how it works and the tuberculin test used
- Answer frequently asked questions regarding the use of the tuberculin test

Sections Module

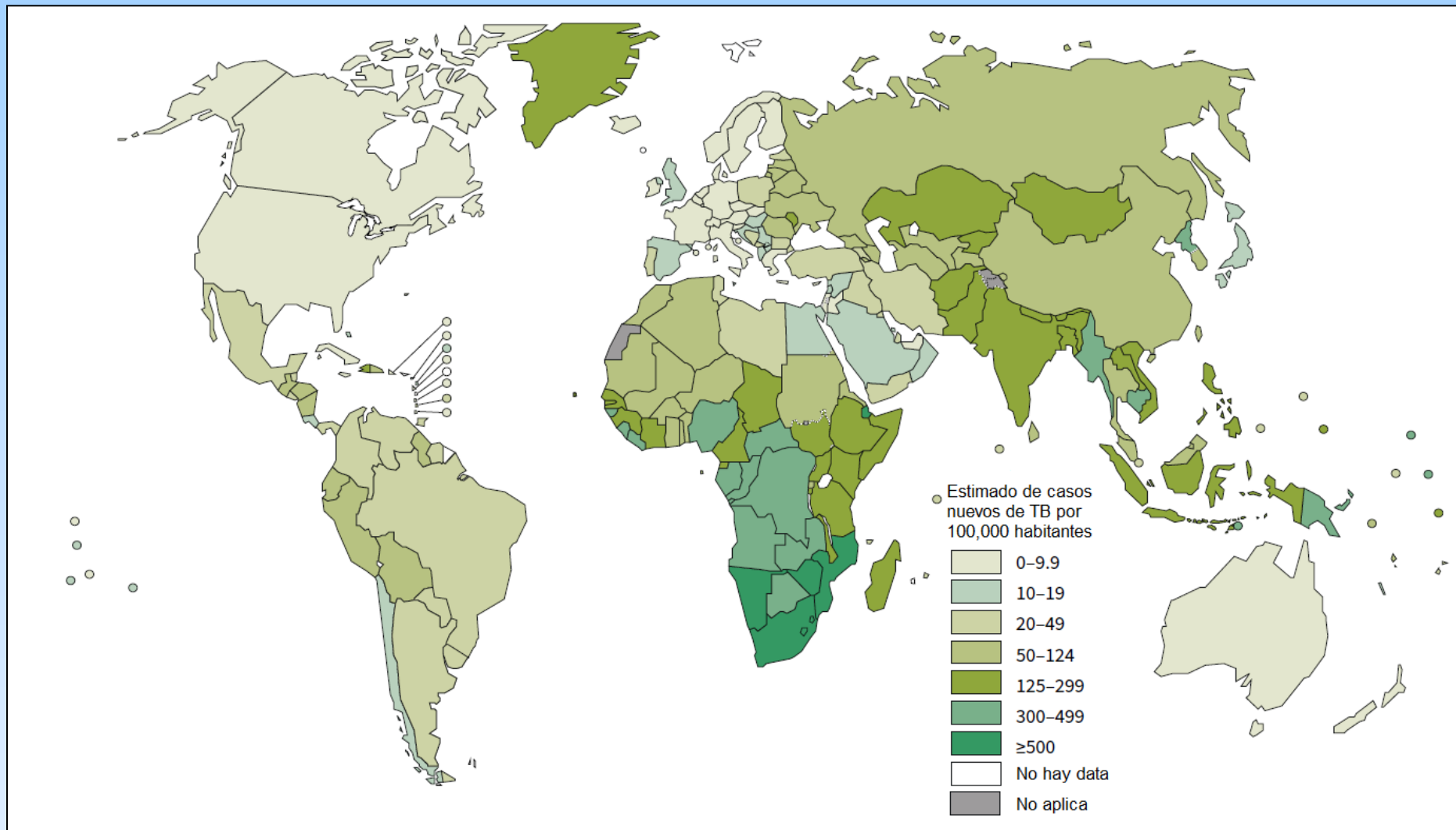
- I. Review of Tuberculosis
- II. Mandatory** notification
- III. Basic facts about the tuberculin test
- IV. FAQ: Using the tuberculin test

I. Review of Tuberculosis

Impact of Tuberculosis (TB) in the World

- ❑ The World Health Organization estimated that in 2013 there were in the world:
 - 9 million new cases of TB
 - 1.5 million deaths caused by TB
- ❑ An estimated 10-15000000 people are infected with the TB bacteria in the United States

Estimated incidence rate of TB in the World, 2013

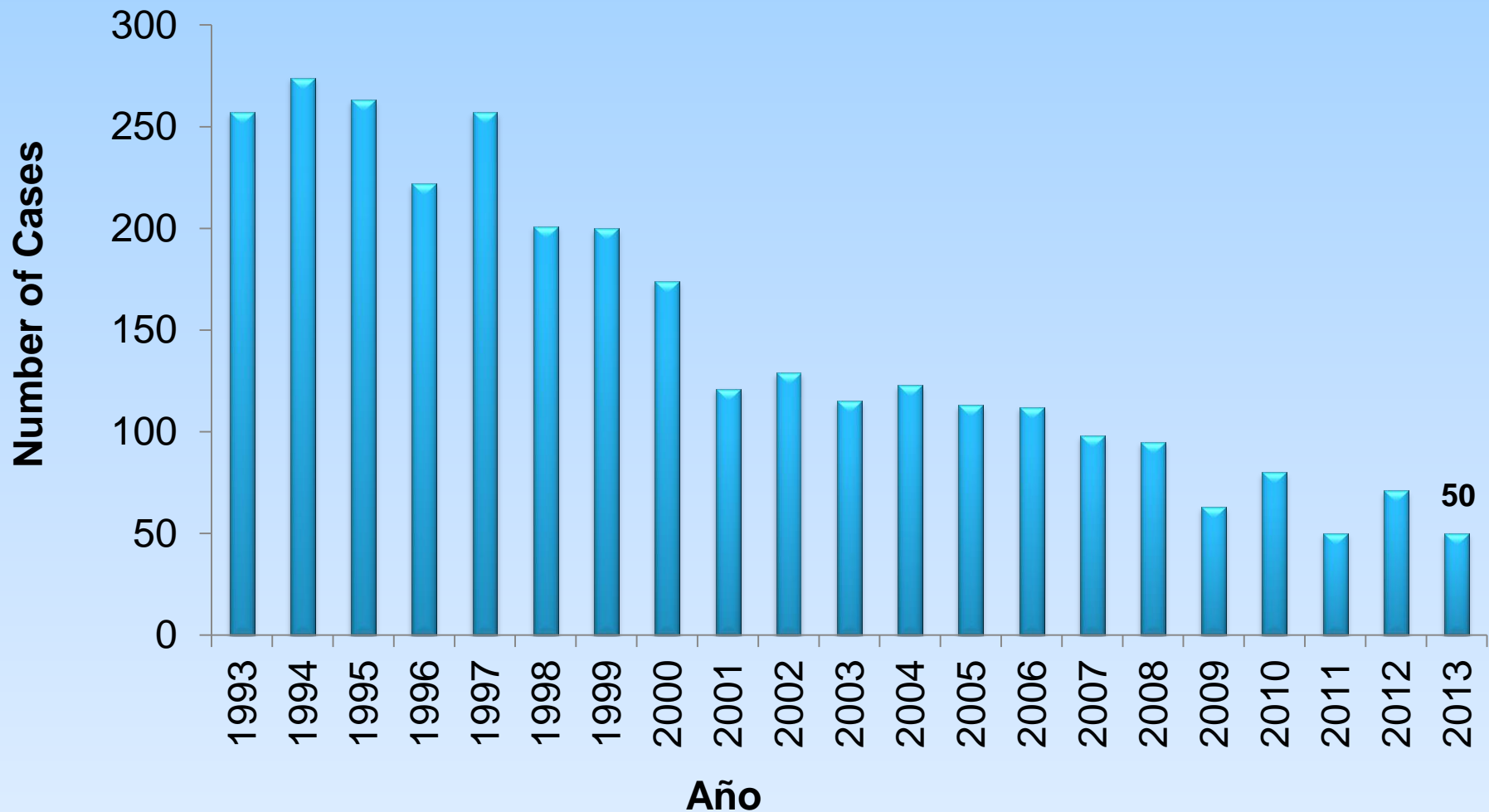


Fuente: Informe Mundial Sobre la Tuberculosis – 2014, Organización Mundial de la Salud

Impact of TB in Puerto Rico

- ❑ TB cases reported in the island have been declining over the years - but the TB still exists in Puerto Rico
- ❑ In 2013, the incidence of TB in Puerto Rico was 1.4 new / 100,000 cases.
- ❑ Although the incidence of TB in Puerto Rico currently is low, the constant movement of people in and out of the island, keeps us connected to the world - including areas with high incidence of TB.

TB cases reported in Puerto Rico, 1993-2013



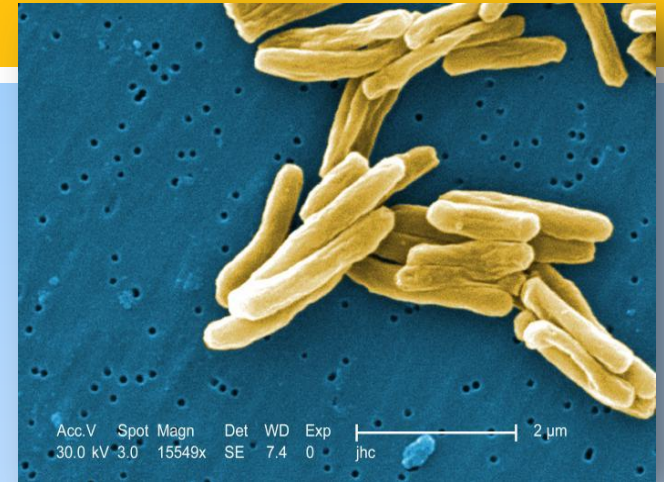
Source: 2013 Annual Report, Program for TB Control, Department of Health of PR

TB diagnostics Puerto Rico

- ❑ According to the TB has been declining on the island has been seen that health professionals have lowered their levels of suspicion surrounding this condition.
- ❑ This is worrying because:
 - Patients are not diagnosed until they are in the later stages of the disease
 - Patients are spending more time in transmitting the disease-free community
- ❑ Identify and report suspected cases of TB quickly it is critical to continue to control this disease in Cuba

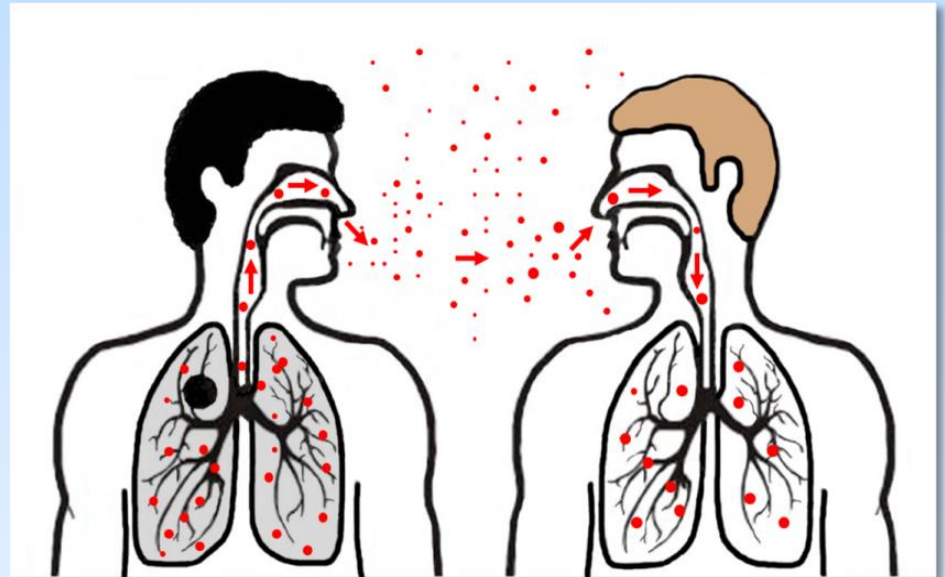
Tuberculosis is ...

- ❑ A serious infectious disease
- ❑ Caused by the *Mycobacterium tuberculosis*
- ❑ It usually affects the lungs, but can develop in other parts of the body or disseminated disease
- ❑ It is preventable and curable



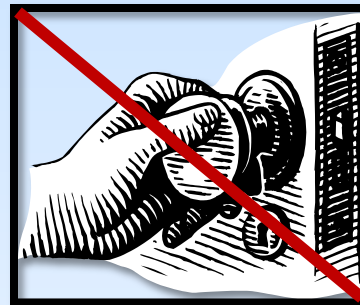
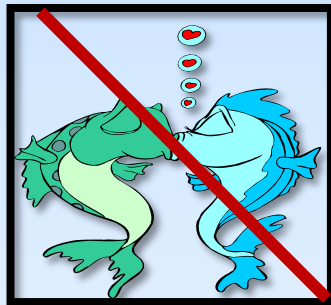
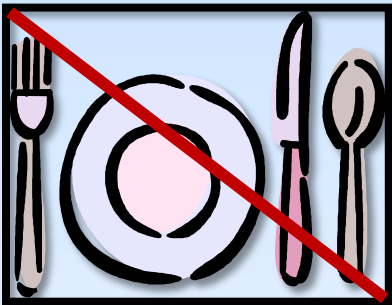
TB transmission

- ❑ TB is transmitted through the air by tiny particles called droplet nuclei
- ❑ These particles carry the TB bacteria and are generated when a person is sick with active infectious TB coughs, sneezes, speaks or sings
- ❑ A person becomes infected when you inhale these particles and the TB bacteria make their way into the lungs



TB transmission

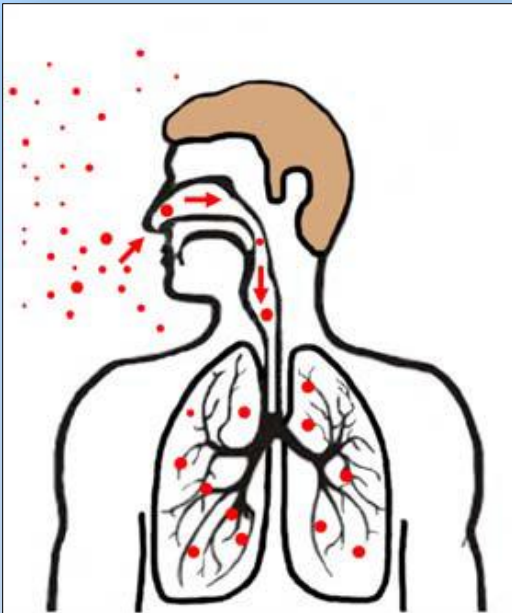
- ❑ TB is **not** spread by contact with surfaces or fluids:
- ❑ Touching or shaking hands
- ❑ Hugging, kissing or having sex
- ❑ Sharing food or personal effects
- ❑ Touching things someone with TB



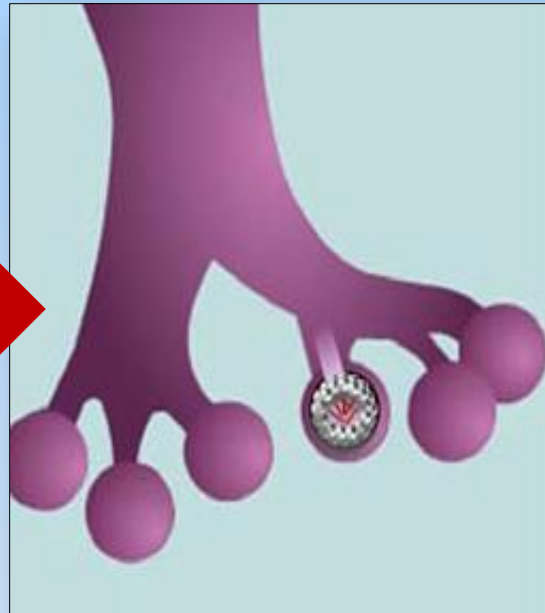
Factors determining likelihood of transmission

Susceptibility	Immune status of the exposed individual
Infectiousness	Amount of bacteria that a person with active TB is infectious expelling air
Ambient	Concentration of bacteria in the air, ventilation, size of space
Exhibition	Proximity, frequency and duration of exposure

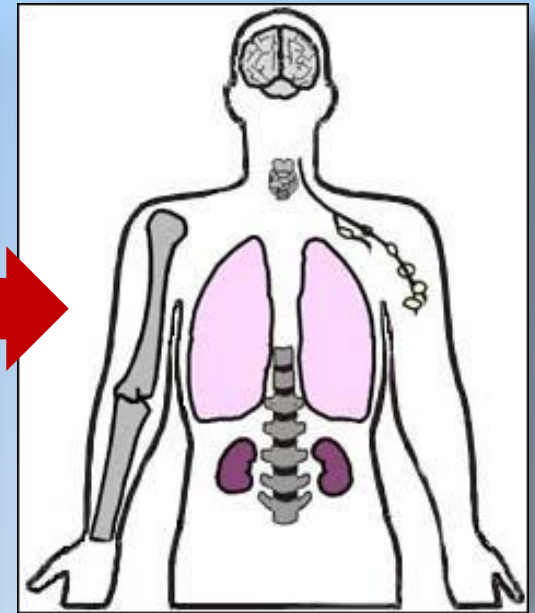
TB pathogenesis



Inhaled TB bacteria travels to the lung

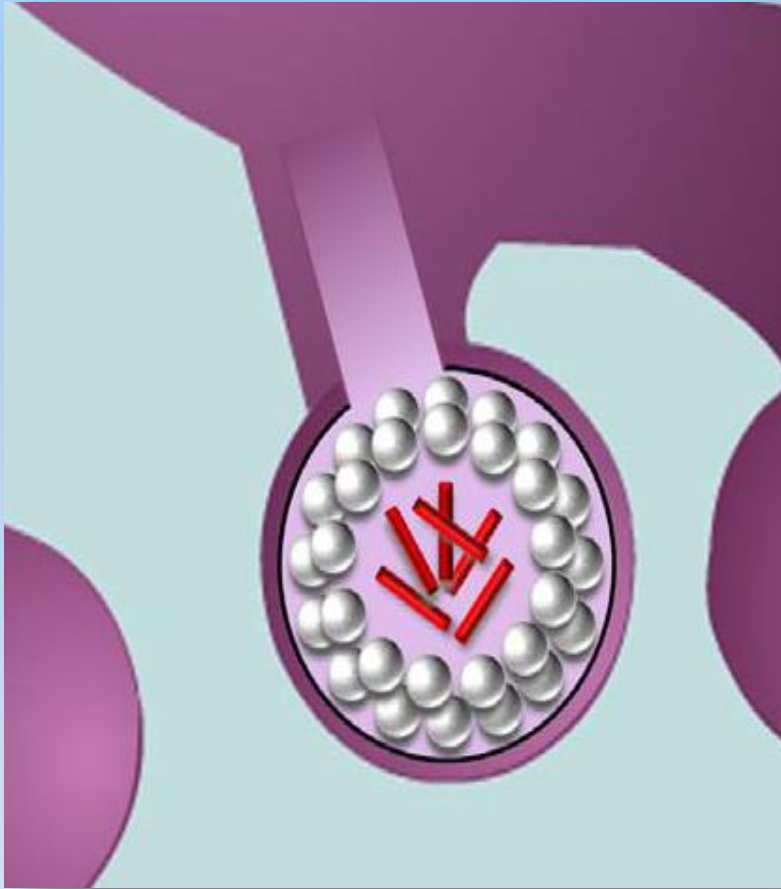


TB bacilli multiply in the Pulmonary alveolar



Small amounts of bacilli are spread by body

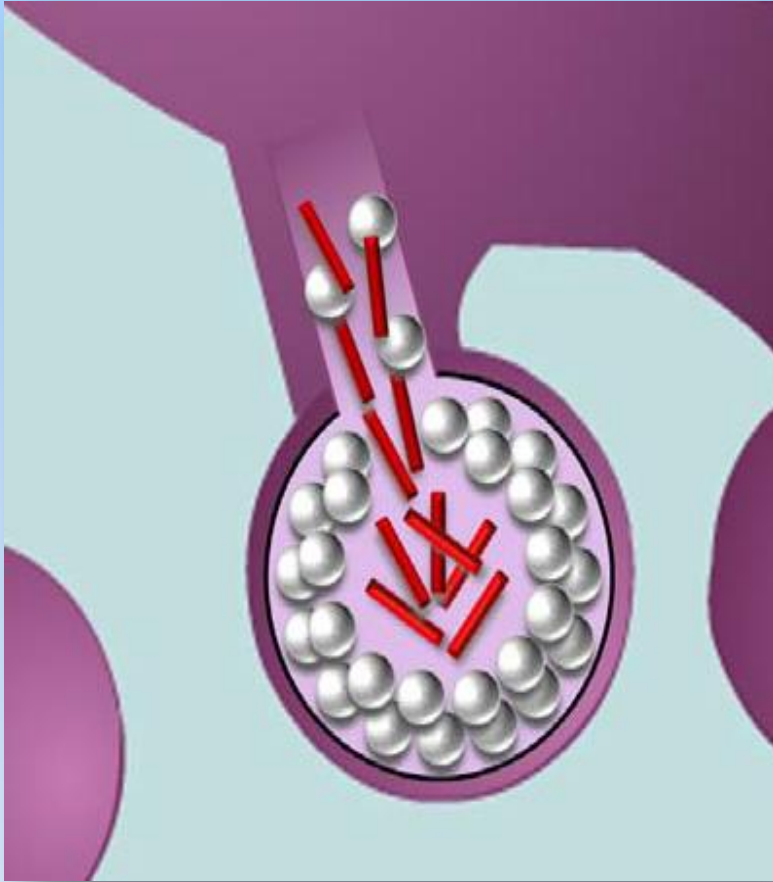
TB pathogenesis



From 2-8 weeks macrophages create a barrier around the TB bacilli. This barrier keeps the bacilli controlled or "asleep".

This is known as **latent TB infection**

Patogénesis de TB



If the immune system can not control the bacilli, the bacilli begin to multiply rapidly. This can occur in different parts of the body.

This is known as:

Disease

Active TB

LATENT INFECTION

Few TB bacteria are alive but inactive

You can not transmit the bacteria to others

You do not feel sick, but you can get sick in the future if your body stops controlling bacteria

Usually you have a positive tuberculin skin test or blood

Normal chest radiography

Preventive treatment is recommended to reduce the chance of developing active disease

It is not case of TB

ACTIVE DISEASE

It has many bacteria in your body and are active

You could spread the bacteria to others

You may feel sick and have symptoms

Usually you have a positive tuberculin skin test or blood

X-ray may be abnormal, if the disease is affecting the lungs

You need treatment for active disease

It is case of TB

Symptoms of the active disease

General symptoms

Fever, tiredness, fatigue, night sweats, weight loss without apparent cause, loss of appetite

Pulmonary

Prolonged cough (3 weeks or more), hemoptysis, trouble breathing, chest pain

Extra-pulmonary

It depends on the affected organ



People at higher risk of becoming infected with TB

- ❑ People with recent, prolonged and frequent contact with someone with active infectious TB
- ❑ People who recently migrated (last 5 years) from countries where there are many TB
- ❑ People visiting countries / areas where there are many TB - or receive visits from people from these areas
- ❑ People living or working in high-risk locations gathered, such as:
 - foster long-term care
 - correctional facilities
 - lodging

People at higher risk of **developing** active TB

- ❑ People infected with HIV
- ❑ Children under 5 years
- ❑ People with a history of TB that was not treated or was treated inappropriately
- ❑ People who have conditions, are in treatment or taking medicines that weaken the **immunologic system**
- ❑ People who smoke, intravenous and / or injecting drug use alcohol excessively
- ❑ Malnourished or low weight

Evaluation process for TB

❑ A medical evaluation for TB must include:

1. **Medical record**
2. **Physical exam**
3. **Screening (tuberculin or blood)**

❑ The assessment of people with positive screening results or clinical suspicion of TB should include:

1. **Chest X-ray**
2. **bacteriological tests**

Program for Tuberculosis Control



- ❑ Seven pulmonary clinics around the island offering
 - Assessments for people with positive screening tests
 - Treatment / monitoring for people with latent TB infection or active
 - Contact Research
- ❑ Consulting clinic for free, confidential health care providers
- ❑ More information: www.salud.gov.pr



II. MANDATORY notification

Administrative Order 302

- ❑ It states that TB is a reportable disease in Puerto Rico
- ❑ All healthcare and laboratory is responsible for notifying the Tuberculosis Program:
 - Suspected or confirmed cases of active TB
 - Positive screening tests (tuberculin tests or blood tests)

Process for reporting suspected cases / confirmed TB

DEPARTAMENTO DE SALUD, SECRETARIA AUXILIAR DE SALUD FAMILIAR, SERVICIOS INTEGRADOS Y PROMOCION DE LA SALUD
 OFICINA CENTRAL PARA ASUNTOS DEL SIDA Y ENFERMEDADES TRANSMISIBLES (OCASET)
 PROGRAMA PARA EL CONTROL DE LA TUBERCULOSIS
 P. O. BOX. 70184, SAN JUAN, P.R. 00936, Tel. 787-274-5553 Fax. 787-274-5559

INFORME INICIAL DE CASO SOSPECHOSO (Categoría V) o CONFIRMADO (Categoría III)

Apellidos: _____ Nombre: _____

14 Dirección: _____
 Pueblo: _____ Código Postal: _____ Teléfono: _____

No. Expediente: _____ No. Seguro Social: _____
 Hospital Clínica Oficina Privada Otro

8 Nacimiento: ____/____/____ **14** Casos con 14 años o Menos:
 Fuera de PR o EU por más de 2 meses: Sí No Lugar: _____
 Guardián¹ PR EU Otro: _____ Guardián² PR EU Otro: _____

9 Sexo: M F **10** Étnico: Hispano No Hispano **11** Raza: Blanco Negro Asiático Índio Nativo EU **12** Nacido: EU PR (un padre PR o ciudadano de EU) PR (padres no PR ni ciudadanos de EU) Otro: _____ **13** Entrada a PR o EU: ____/____/____ (mes/año)

15 Estatus de Inmigración al Entrar: N/A Visa de Inmigrante Visa de Estudiante Visa de Empleo Visa de Turista Visa de Familia/Prometido Refugiado Asilado Otro Rechusa Contestar/Desconoce

7 Diagnóstico Previo: No Sí Año: ____/____/____ **15** Al Momento del Diagnóstico: Vivo Muerto
 Relacionada a TB: Sí No Fecha de Muerte: ____/____/____ (mes/día/año)

16 Lugar de la Enfermedad: Pulmonar Pleural Extrapulmonar: _____

Toma de Espudo: ____/____/____ #ID. _____ Toma de Otra Muestra: ____/____/____ : ____/____/____ #ID. _____

17 Baciloscopia: Positivo Negativo No Hecha **19** Baciloscopia: Positivo Negativo No Hecha
18 Cultivo: Positivo Negativo No Hecha Otra **20** Cultivo: Positivo Negativo No Hecha Otra
 Reporte de Cultivo: ____/____/____ Reporte de Cultivo: ____/____/____
 Nombre de Laboratorio: _____ Nombre de Laboratorio: _____

22a Radiografía Inicial: ____/____/____ **22b** CT/Otro Inicial: ____/____/____ **23** Tuberculina: ____/____/____
 Normal Anormal (TB) No Hecha Normal Anormal (TB) No Hecha Positiva Negativa No Hecha
 Cavitaria No Cavitaria Cavitaria No Cavitaria Cavitaria No Cavitaria No Hecha
 Evidencia de TB miliar: No Sí Evidencia de TB miliar: No Sí Lectura ____ mm

25 Razón Primaria de Evaluación: Síntomas Radiografía anormal (TB) Investigación de contactos Pruebas en actividades/Grupo de alto riesgo Trabajador de la salud Prueba para empleo Examen de inmigración Laboratorio incidental


26 Prueba de VIH: Negativo Positivo Rechusa No Ofrecida En Espera **29** Cuidado Prolongado: No Clínico Hospitalario Residencial Mental Rehabilitación (droga/alcohol) Otro
 Fecha: ____/____/____ **30** Empleo en: Salud Penal Migratorio Otro Retirado Desempleo
 No Búsqueda de Empleo (estudiante, ama de casa, incapacitado)

27 Deambulante: No Sí **31** Usuario DI: No Sí **32** Otras Drogas: No Sí **33** Alcoholismo: No Sí
28 Penal: No Federal Estatal Juvenil Otra: _____
 Bajo custodia de inmigración: No Sí

1. Immediately call to 787-765-2929, ext 3861 or epidemiology technician in your region

2. Send Case Cover Sheet (see next) by fax - completely fills the Tuberculosis Control Program

Reporting process for Positive screening tests

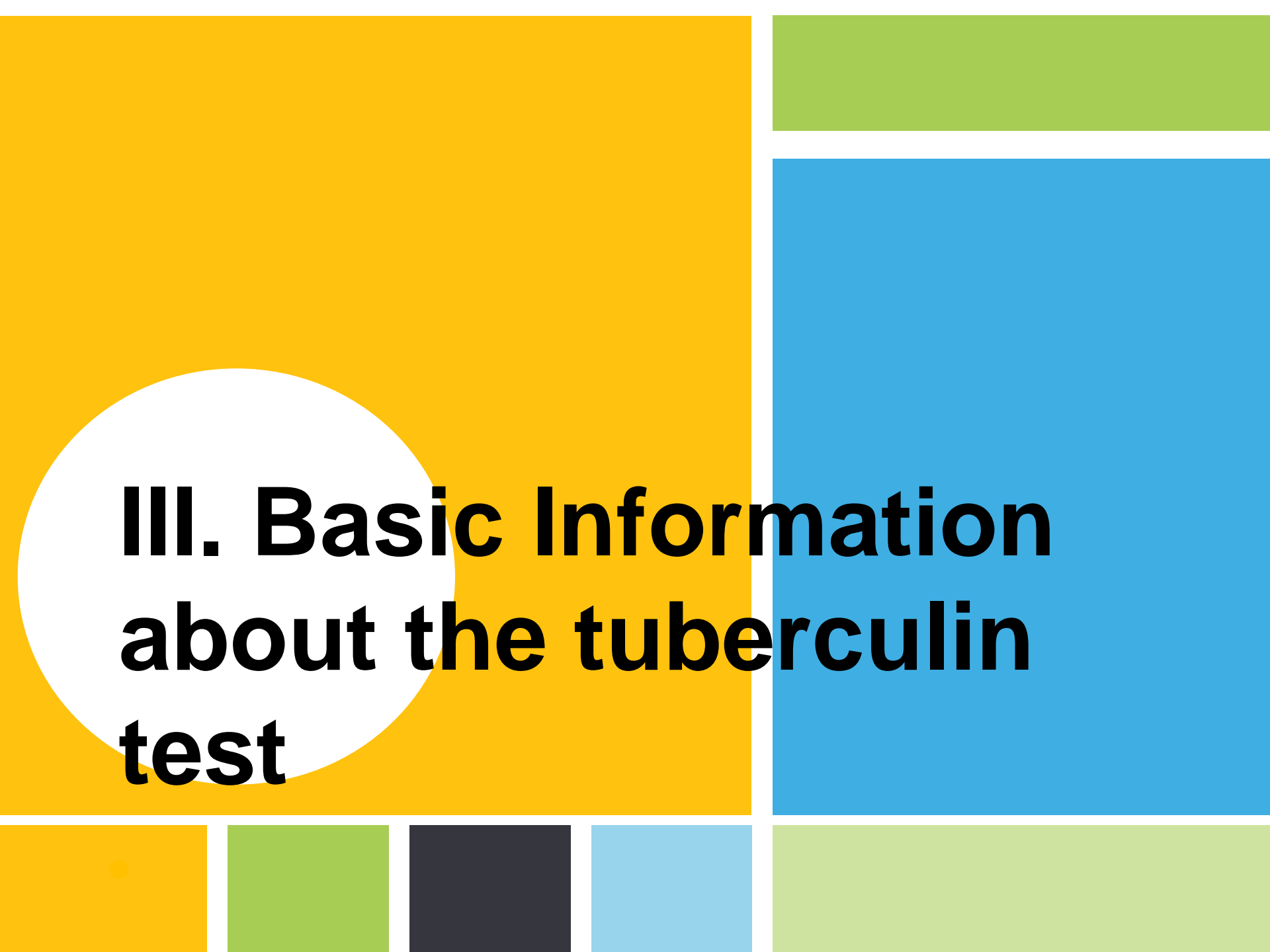

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 Departamento de Salud

PROGRAMA PARA EL CONTROL DE LA TUBERCULOSIS
INFORME DE PRUEBAS DE TUBERCULINAS E IGRAS POSITIVAS

Información del Paciente		
Nombre:		Fecha de Nacimiento: _____ Edad: _____ <small>Mes / Día / Año</small>
Sexo: <input type="checkbox"/> F <input type="checkbox"/> M	Estado Civil:	Núm. Teléfono: () -
Ocupación:	Lugar de Trabajo o Estudio:	
Dirección Postal:		Código de Área:
Dirección Física:		Código de Área:
Vacuna BCG: <input type="checkbox"/> SI <input type="checkbox"/> NO	País de Nacimiento:	Nombre de Padre o Guardián (para menores de 18 años):
Tipo de Prueba Realizada: <input type="checkbox"/> PPD <input type="checkbox"/> IGRA (Quantiferon TB Gold)		
Fecha Aplicación PPD: _____ <small>Mes / Día / Año</small>	Fecha Lectura PPD: _____ <small>Mes / Día / Año</small>	Fecha Aplicación: _____ <small>Mes / Día / Año</small> Resultado IGRA(Quantiferon TB Gold): <input type="checkbox"/> Positivo <input type="checkbox"/> Negativo
Lectura PPD (en mm): _____		
¿Se refirió paciente para placa de pecho? <input type="checkbox"/> SI <input type="checkbox"/> NO		¿Se comenzó paciente en tratamiento preventivo? <input type="checkbox"/> SI <input type="checkbox"/> NO
¿Se refirió paciente a otra facilidad? <input type="checkbox"/> SI - Especifique cual: _____ <input type="checkbox"/> NO		
Marque Factores de Riesgo, si alguno: <input type="checkbox"/> Contacto con Paciente Infeccioso (2 años o menos) <input type="checkbox"/> Nacido/Visita País de Alta Incidencia <input type="checkbox"/> VIH / SIDA <input type="checkbox"/> Diabetes <input type="checkbox"/> Cáncer <input type="checkbox"/> Sistema Inmunosuprimido <input type="checkbox"/> Uso de Drogas <input type="checkbox"/> Consumo Excesivo de Alcohol <input type="checkbox"/> Deambulante <input type="checkbox"/> Peso Corporal Debajo de lo Normal <input type="checkbox"/> Otro - Especifique: _____		
Información de Profesional que hace Referido		
Nombre de Profesional que hace Referido:		Núm. Licencia Profesional:
Agencia/Clinica:	Núm. Teléfono: () -	Correo Electrónico:
Dirección:		Código de Área:

PO Box 70184 San Juan, PR 00936-8184 - Tel. (787)765-2929 ext. 3861 - Fax (787)274-5559

Send Report Sheet tuberculin test or IGRA (see next) the Tuberculosis Control Program in 5 days



**III. Basic Information
about the tuberculin
test**

Screening

- ❑ There are two tests for exposure to TB bacteria in a person:
 - Tuberculin skin test (called PPD)
 - Blood Test Determination of Interferon Gamma Release (IGRA, for its acronym in English)
- ❑ These tests do not indicate whether a person has active TB disease or when a person is infected with bacteria
- ❑ A negative result on these tests should not be used alone to rule out a diagnosis of TB. It is necessary to assess the whole picture of the patient.

TST

- ❑ This is accomplished by administering an **intra**dermal injection of **0.1 ml of a purified protein derivative** (PPD, for its acronym in English)
 - It is containing **5 tuberculin units**
 - The injection is given into the **volar surface of the forearm or above**
- ❑ The only test reading is based on a reaction of induration
- ❑ The reaction should be read between **48 and 72 hours** after administration of tuberculin by a trained registered nurse or physician trained

How the tuberculin test work?

- ❑ Induces a delayed hypersensitivity reaction at the cellular level
- ❑ The PPD contains antigens that activate T cells, if they have been in contact with bacteria of *M. tuberculosis*
- ❑ Activation of these cells produces an **induration** in the skin where the test is administered
 - Erythema (red area) does not indicate that a person has been exposed to the bacteria of *M. tuberculosis*

Storage and handling of PPD

- ❑ Keep refrigerated at temperatures of 35 ° - 46 ° F (2 ° - 8 ° C)
- ❑ Keep away from light
 - It is recommended that the bottles are kept within their own cartons when not in use to avoid exposure to light in and out of the fridge.
- ❑ Write date and initials to open a vial
- ❑ Discard after 30 days of open (manufacturing guidelines)
- ❑ Vacuum the PPD in the syringe immediately before injection
 - Amounts of PPD can stay attached to the syringe whether they are served with anticipation, affecting the doses tested

Factors that may affect the outcome of a tuberculin test

- ❑ Recent infection with *M. Tuberculosis* mycobacterium
 - Taking 2-8 weeks for the immune system to react to PPD
 - Recently infected people may have a false-negative result to the tuberculin test
- ❑ Infection with other mycobacteria that are not *M. tuberculosis*
 - Infection with other mycobacteria can produce false-positive results
- ❑ Human errors in handling the PPD, management, reading or interpretation of the test

Factors that may affect the outcome of a tuberculin test

- ❑ **Allergy** (the inability of immune system to produce a reaction)
 - People with weakened immune systems may have a false-negative

- ❑ **Live virus vaccines**
 - (Eg, MMR, oral polio, chickenpox, yellow fever, oral typhoid)
 - The test should be administered the same day or 4 weeks after these vaccines

IGRA blood test

- ❑ Based blood sample test that serves as an alternative to the tuberculin test
- ❑ It just requires a visit to the patient
- ❑ Available through some hospitals and private laboratories and requires that the patient is willing to afford
- ❑ **Its** costs varies between \$ 80 - \$ 250, depending on the region of the Island
- ❑ Trade names: QuantiFERON® and T-Spot®



IV. FAQs: Using the tuberculin test

Is the tuberculin test safe for pregnant women?

YES

- The tuberculin test is safe and reliable in pregnant women.
- The test can be administered throughout pregnancy.

Is the tuberculin test safe for infants and children?

YES

- The tuberculin test is safe and reliable in infants and children.
- Because your immune system, usually infants under 6 months do not have a reaction to the test.

A person with a positive tuberculin test, can still go to work?

It Depends

- If a person has a positive tuberculin but no symptoms, you may continue to attend school / work.
- If a person with a positive tuberculin test has symptoms, you should not return to school / work until it has ruled out a diagnosis of active TB disease.

A person who has had TB, can again re-infected or sick with TB?

YES

- People do not develop immunity to TB infection or disease have had in the past.
- Treatment for latent infection or active TB disease does not protect against future re-infection with mycobacteria.
- Whenever a person is exposed to someone with active TB disease are at risk of re-infected and sick with TB.

Can tuberculin test be repeated to a person who has already had a positive result?

YES

- Repeat the tuberculin test people who have had a previous positive result is not harmful
- It is not necessary to repeat the test if:
 - The person has documentation of their positive previous result, or
 - if a doctor can document a positive previous result
- If no documentation or confirmation of a positive preliminary results, should repeat the test

If a person does not want the tuberculin test, I can make a chest X-ray?

No

- ❑ A chest X-ray can not be used to replace a screening test because these tests measure different things.
 - Chest plates only indicate whether a person has an active lung disease, not whether a person is infected with TB bacteria.

- ❑ The chest X-ray should only be used for people with medical documentation or confirmation:
 - positive screening test,
 - prior treatment for latent TB infection or disease, or
 - severe allergy to tuberculin test (if the person has no documentation describes a severe reaction but no retest)

What happens if a person says he is allergic to the tuberculin test?

- ❑ Ask the person:
 - Do you have documentation that allergic reaction?
 - What happened the last time you got proof?
- ❑ People allergic to the tuberculin test reactions are rare. Reactions of redness, itching and / or induration at the test area are considered typical.
- ❑ If the person describes a typical reaction as described above, orient and repeat the test.
- ❑ If the person provides documentation or describe a severe systemic allergic reaction or not retest.

Is there a vaccine againsts TB?

YES

- ❑ Yes the **vaccine** is called Bacille de Calmette-Guérin(BCG)
- ❑ This **vaccine** is **administered** as a rutinary vacine to infants/kids in countries with a high incidence of TB.
 - It helps protects kids of more severe forms of TB
 - Its not used on the United States or Puerto Rico
- ❑ The effectiveness is diferent and it decresses through time. People vaccinated with BCG could be infected with the TB bacteria and develop the disease

Can the Tuberculin test be use with a person with the BCG Vaccine?

Yes

- ❑ The tuberculine test **could be used** in people vaccinated with the BCG
 - Not every person with the BCG Vaccination have positive results with the tuberculin test.
- ❑ Usually an adult with the BCG have a postive result with the tuberculin test, is concider infected with the bacteria.



**End of Module:
Part I : Theory**

Next Step...

- ❑ Congratulations you have completed the first step towards your certification!
- ❑ Please Call 787-765-2929 extension 4751 for any question related to the information provided in this module.