Targeted Testing and Treatment of Latent Tuberculosis Infection

Text Only Version

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Slide 1: Targeted Tuberculosis (TB) Testing and Treatment of Latent Tuberculosis Infection

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Division of Tuberculosis Elimination

Slide 2: Targeted TB Testing and Treatment of Latent TB Infection

As TB disease rates in the United States decrease, finding and treating persons at high risk for latent TB infection (LTBI) has become a priority.

Targeted TB testing is used to focus program activities and provider practices on groups at the highest risk for TB.

Treatment of LTBI substantially reduces the risk that persons infected with M. tuberculosis will progress to TB disease.

Slide 3: Latent TB Infection (LTBI)

LTBI is the presence of M. tuberculosis organisms (tubercle bacilli) without signs and symptoms or radiographic or bacteriologic evidence of TB disease.

Slide 4: LTBI vs. Pulmonary TB Disease – 1

Latent TB Infection

Positive TST* or IGRA† result

Chest radiograph normal

Pulmonary TB Disease

TST or IGRA is usually positive

Chest radiograph is usually abnormal

*tuberculin skin test
† Interferon-Gamma Release Assay

Slide 5: LTBI vs. Pulmonary TB Disease – 2

Latent TB Infection

No symptoms or physical findings suggestive of TB disease

If done, respiratory specimens are smear and culture negative

Pulmonary TB Disease

Symptoms may include one or more of the following: fever, cough, night sweats, weight loss, fatigue, hemoptysis, decreased appetite

Respiratory specimens are usually culture positive (smear positive in about 50% of patients)

Slide 6: Targeted TB Testing

Essential TB prevention and control strategy

Detects persons with LTBI who would benefit from treatment

De-emphasizes testing of groups that are not at high risk for TB

Can help reduce the waste of resources and prevent inappropriate treatment

Slide 7: Treatment of LTBI – Milestones – 1

For more than 3 decades, an essential component of TB prevention and control in the United States has been the treatment of persons with LTBI to prevent TB disease.

Slide 8: Treatment of LTBI – Milestones – 2

1965: American Thoracic Society (ATS) recommends treatment of LTBI for those with previously untreated TB, tuberculin skin test (TST) converters, and young children.

1967: Recommendations expanded to include all TST positive reactors (≥ 10 mm).

Slide 9: Treatment of LTBI – Milestones – 3

1974: CDC and ATS guidelines established for pretreatment screening to decrease risk of hepatitis associated with treatment

Treatment recommended for persons ≤ 35 years of age

Slide 10: Treatment of LTBI – Milestones – 4

1983: CDC recommends clinical and laboratory monitoring of persons ≥ 35 who require treatment for LTBI

1998: CDC recommends 2 months of rifampin (RIF) plus pyrazinamide (PZA) as an option for HIV-infected patients (later changed)

Slide 11: Treatment of LTBI – Milestones – 5

2000: CDC and ATS issue updated guidelines for targeted testing and LTBI treatment1

9-month regimen of isoniazid (INH) is preferred

2-month regimen of RIF and PZA and a 4 month regimen of RIF recommended as options (later changed)

1 MMWR(http://wwwdev.cdc.gov/mmwr/preview/mmwrhtml/rr4906a1.htm) June 9, 2000; 49(No. RR-6)(http://wwwdev.cdc.gov/mmwr/preview/mmwrhtml/rr4906a1.htm)

Slide 12: Treatment of LTBI – Milestones – 6

2001: Owing to liver injury and death associated with 2-month regimen of RIF and PZA, use of this option de-emphasized in favor of other regimens2

2003: 2-month regimen of RIF and PZA generally not recommended — to be used only if the potential benefits outweigh the risk of severe liver injury and death3

2MMWR(http://wwwdev.cdc.gov/mmwr/preview/mmwrhtml/mm5034a1.htm) August 31, 2001; 50(34): 733-735(http://wwwdev.cdc.gov/mmwr/preview/mmwrhtml/mm5034a1.htm)

3MMWR(http://wwwdev.cdc.gov/mmwr/preview/mmwrhtml/mm5231a4.htm) August 8, 2003; 52(31): 735-739(http://wwwdev.cdc.gov/mmwr/preview/mmwrhtml/mm5231a4.htm)

Slide 13: Treatment of LTBI – Milestones – 7

2011: CDC recommends 12-doses (3 months) of isoniazid (INH) and rifapentine (RPT) as an option equal to the standard 9-month INH regimen for certain groups*

2016: U.S. Preventive Services Task Force recommends testing for TB as a part of standard preventive care for certain at-risk groups**

*Recommendations for Use of an Isoniazid–Rifapentine Regimen with Direct Observation to Treat Latent Mycobacterium tuberculosis Infection

Slide 14: Identifying Risk Factors That Lead to Development of TB Disease

Slide 15: Persons at Risk for Developing TB Disease

Persons at high risk for developing TB disease fall into 2 categories:

Those who have an increased likelihood of exposure to persons with TB disease

Those with clinical conditions that increase their risk of progressing from LTBI to TB disease

Slide 16: Increased Likelihood of Exposure to Persons with TB Disease

Persons at risk for exposure to persons with TB disease include:

Close contacts to person with infectious TB

Residents and employees of high-risk congregate settings (e.g., correctional facilities, homeless shelters, health care facilities)

Recent immigrants from TB-endemic regions of the world (within 5 years of arrival to the United States)

Slide 17: Increased Risk for Progression to TB Disease – 1

Persons more likely to progress from LTBI to TB disease include:

HIV-infected persons

Those with a history of prior, untreated TB or fibrotic lesions on chest radiograph

Children ≤ 5 years with a positive TST

Slide 18: Increased Risk for Progression to TB Disease – 2

Persons more likely to progress from LTBI to TB disease include:

Underweight or malnourished persons

Substance abusers (such as smoking, alcohol abuse, or injection drug use)

Those receiving TNF-α antagonists for treatment of rheumatoid arthritis or Crohn's disease

Slide 19: Increased Risk for Progression to TB Disease – 3

Persons more likely to progress from LTBI to TB disease include:

Those with certain medical conditions such as:

Silicosis

Diabetes mellitus

Chronic renal failure or on hemodialysis

Solid organ transplantation (e.g., heart, kidney)

Carcinoma of head or neck

Gastrectomy or jejunoilial bypass

Slide 20: Testing for M. tuberculosis Infection

Slide 21: Testing for M. tuberculosis Infection

There are two testing methods available for the detection of M. tuberculosis infection in the United States:

Mantoux tuberculin skin test (TST)

Interferon-gamma release assays (IGRA)

These tests do not exclude LTBI or TB disease

Decisions about medical and public health management should include other information, and not rely only on TST or IGRA results

Slide 22: Mantoux Tuberculin Skin Test

Skin test that produces delayed-type hypersensitivity reaction in persons with M. tuberculosis infection

TST is useful for:

Determining how many people in a group are infected (e.g., contact investigation)

Examining persons who have symptoms of TB disease

Multiple puncture tests (e.g., Tine Test) are inaccurate and not recommended

Slide 23: Administering the TST

Inject 0.1 ml of 5 TU PPD tuberculin solution intradermally on volar surface of lower arm using a 27-guage needle

Produce a wheal 6 to 10 mm in diameter

[Image: Drawing of gloved hands holding a tuberculin syringe and injecting PPD into an arm. The drawing shows a discrete, pale elevation of the skin (wheal) has been formed.]

Slide 24: Reading the TST – 1

Measure reaction in 48 to 72 hours

Measure induration, not erythema

Record reaction in millimeters, not “negative” or “positive”

Ensure trained health care professional measures and interprets the TST

[Image: Drawing of a hand holding a TST ruler and measuring the diameter of an induration. Only the induration is being measured; this is the correct way to read the TST reaction.]

Slide 25: Reading the TST – 2

Educate patient and family regarding significance of a positive TST result

Positive TST reactions can be measured accurately for up to 7 days

Negative reactions can be read accurately for only 72 hours

Slide 26: TST Interpretation – 1

≥ 5 mm induration is interpreted as positive in

HIV-infected persons

Close contacts to an infectious TB case

Persons with chest radiographs consistent with prior untreated TB

Slide 27: TST Interpretation – 2

≥ 5 mm induration is interpreted as positive in

Organ transplant recipients

Other immunosuppressed patients (e.g. , those taking the equivalent of > 15 mg/d of prednisone for 1 month or those taking TNF-α antagonists)

Slide 28: TST Interpretation – 3

≥ 10 mm induration is interpreted as positive in

Recent immigrants

Injection drug users

Residents or employees of congregate settings

Mycobacteriology laboratory personnel

Slide 29: TST Interpretation – 4

≥ 10 mm induration is interpreted as positive in

Persons with clinical conditions that place them at high risk

Children < 4 years; infants, children, and adolescents exposed to adults at high-risk

Slide 30: TST Interpretation – 5

≥ 15 mm induration is interpreted as positive in

Persons with no known risk factors for TB.

Although skin testing programs should be conducted only among high-risk groups, certain individuals may require TST for employment or school attendance. Diagnosis and treatment of LTBI should always be tied to risk assessment.

Slide 31: Factors That May Cause False-Positive TST Reactions

Nontuberculous mycobacteria

Reactions caused by nontuberculous mycobacteria are usually £10 mm of induration

BCG vaccination

Reactivity in BCG vaccine recipients generally wanes over time; positive TST result is likely due to TB infection if risk factors are present

Slide 32: Factors That May Cause False-Negative TST Reactions -1

Anergy

Inability to react to a TST because of a weakened immune system

Usefulness of anergy testing in TST-negative persons who are HIV infected has not been demonstrated

Slide 33: Factors That May Cause False-Negative TST Reactions – 2

Recent TB Infection

Defined as less than 10 weeks after exposure

Very young age

Newborns (< 6 months)

Slide 34: Factors That May Cause False-Negative TST Reactions – 3

Live virus vaccination

For example, measles or smallpox

Can temporarily suppress TST reactivity

Overwhelming TB Disease

Poor TST administration technique

For example, TST injection too shallow or too deep, or wheal is too small

Slide 35: Boosting

Some people with LTBI may have a negative skin test reaction when tested years after infection because of a waning response.

An initial skin test may stimulate (boost) the ability to react to tuberculin.

Positive reactions to subsequent tests may be misinterpreted as new infections rather than “boosted” reactions.

Slide 36: Two-Step Testing – 1

A strategy to determine the difference between boosted reactions and reactions due to recent infection.

If 1st test positive, consider infected; if negative, give 2nd test 1–3 weeks later

If 2nd test positive, consider infected; if negative, consider uninfected

Use two-step tests for initial baseline skin testing of adults who will be retested periodically (e.g., health care workers).

Slide 37: Two-step TST Testing – 2

This is a diagram describing two-step TST testing. Administer a baseline skin test. If the reaction is positive, the person probably has TB infection; provide follow-up for positive TST and evaluate for LTBI treatment. If the reaction is negative, retest 1 to 3 weeks later. If the reaction to the second test is positive, it is considered a boosted reaction (due to TB infection that occurred a long time ago). Note: The person does have LTBI; a decision must be made whether to treat or not. Provide follow-up for positive TST and evaluate for LTBI treatment. If the reaction to the second test is negative, the person probably does not have TB infection. Repeat TST at regular intervals; a positive reaction could be due to a recent TB infection.

Slide 38: Interferon-Gamma Release Assays (IGRAs)

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Whole-blood test used to detect M. tuberculosis infection

Two U.S. Food and Drug Administration (FDA) approved IGRAs are commercially available in the U.S.:

QuantiFERON® -TB Gold-in-tube test (QFT-GIT)

T.SPOT®.TB test (T-Spot)

[Image: photo of QuantiFERON-TB Gold In-Tube test kit]

[Image: photo of T-Spot.TB test kit]

Slide 40: How IGRAs Work – 1

Blood test that measures and compares amount of interferon-gamma (IFN-g) released by blood cells in response to antigens

Entails mixing blood samples with antigens from M. tuberculosis and controls

Slide 41: How IGRAs Work – 2

Cells that recognize the antigen release interferon-g

Amount of interferon released in response to M. tuberculosis antigens is compared to amount released in response to other antigens

Slide 42: Administering IGRAs

Confirm and arrange for delivery of blood sample within specific time-frame to ensure viability of blood samples

Draw blood sample according to test manufacturer’s instructions

Schedule a follow up appointment to receive test results, medical evaluation and possible treatment if needed

Slide 43: Interpretation of IGRA Test Results

QFT-GIT test results are reported as positive, negative, indeterminate

T-Spot test results are reported as positive, negative, indeterminate, or borderline

Note: Laboratory should provide both quantitative and qualitative results

Slide 44: Advantages of IGRAs

Requires a single patient visit to conduct test

Results can be available within 24 hours

Does not boost responses measured by subsequent tests

Prior BCG vaccination does not cause false-positive IGRA test result

Slide 45: Disadvantages/Limitations of IGRAs – 1

Errors in collecting and transporting blood, or in interpreting assays can decrease accuracy of IGRAs

Limited data on use of IGRAs to predict who will progress to TB disease in the future

Slide 46: Disadvantages/Limitations of IGRAs – 2

Tests may be expensive

Limited data on the use of IGRAS for

Children < 5 years of age;

Persons recently exposed to M. tuberculosis;

Immunocompromised persons; and

Serial testing

Slide 47: TB Test Selection

Slide 48: Selecting a Test to Detect TB Infection – 1

IGRAs are preferred method of testing for

Groups of people who have poor rates of returning to have TST read

Persons who have received BCG vaccine

TST is the preferred method of testing for

Children under the age of 5

Slide 49: Selecting a Test to Detect TB Infection – 2

Before initiating treatment for LTBI

Either TST or IGRA can be used without preference for other groups that are tested for LTBI

Routine testing with TST and IGRA is NOT recommended

Slide 50: Evaluation of Persons with Positive TB Test Results

Slide 51: Evaluation of Persons with Positive TB Test Results

This is a diagram explaining the evaluation of persons with positive TB test results. If a person has a positive test result for TB infection and TB disease is ruled out, consider the person for treatment of LTBI. If the person accepts and is able to receive treatment for LTBI, the clinician should develop a plan of treatment with the patient to ensure the patient's adherence. But if the person refuses or is unable to receive treatment for LTBI, then follow-up TSTs or IGRAs and serial chest radiographs are unnecessary; in that case, the clinician would educate the patient about the signs and symptoms of TB disease.

Slide 52: LTBI Treatment regimens

Slide 53: Initiating Treatment

Before initiating treatment for LTBI

Rule out TB disease by history, physical examination, chest radiography and, when indicated, bacteriologic studies

Determine prior history of treatment for LTBI or TB disease

Assess risks and benefits of treatment

Determine current and previous drug therapy

Slide 54: Treatment Regimens for Latent TB Infection

Drug(s)	Duration	Interval	Minimum Doses
Isoniazid (INH)	9 months	Daily	270
		Twice weekly	76
	6 months	Daily	180
		Twice weekly	52

Isoniazid (INH)and Rifapentine (RPT)	3 months	Once weekly	12
Rifampin (RIF)	4 months	Daily	120

Note: Rifampin (RIF) and Pyrazinamide (PZA) should not be offered to persons with LTBI. RIF and PZA should continue to be administered in multidrug regimens for the treatment of persons with TB disease.

Slide 55: Latent TB Infection Treatment Regimens – Isoniazid (INH) – 1

9-month regimen of isoniazid (INH) is one of the preferred regimens

6-month regimen is less effective but may be used if unable to complete 9 months

May be given daily or intermittently (twice weekly)

Use directly observed therapy (DOT) for intermittent regimen

Preferred regimen for children 2-11 years of age

Slide 56: Latent TB Infection Treatment Regimens – Isoniazid (INH) – 2

Doses

INH daily for 9 months - 270 doses within 12 months

INH twice/week for 9 months - 76 doses within 12 months

INH daily for 6 months - 180 doses within 9 months

INH twice/week for 6 months - 52 doses within 9 months

Slide 57: Latent TB Infection Treatment Regimens – Isoniazid (INH) and Rifapentine (RPT) – 1

3-month regimen of INH and RPT is an option equal to 9-month INH regimen for treating LTBI in certain groups, such as otherwise healthy people, 12 years of age and older, who were recently in contact with infectious TB or who had tuberculin skin test conversions or positive blood test for TB*

Must use directly observed therapy (DOT)

*Recommendations for Use of an Isoniazid–Rifapentine Regimen with Direct Observation to Treat Latent Mycobacterium tuberculosis Infection

Slide 58: Latent TB Infection Treatment Regimens – Isoniazid (INH) and Rifapentine (RPT) – 2

Not recommended for children younger than 12 years of age, HIV-infected people taking antiretroviral therapy, pregnant women, or women expecting to be pregnant within the 12-week regimen

INH and RPT once a week for 3 months - 12 doses within 4 months

Slide 59: Latent TB Infection Treatment Regimens – Rifampin

Rifampin (RIF) given daily for 4 months is an acceptable alternative when treatment with INH is not feasible.

In situations where RIF cannot be used (e.g., HIV-infected persons receiving protease inhibitors), rifabutin may be substituted.

RIF daily for 4 months - 120 doses within 6 months

Slide 60: Latent TB Infection Treatment Regimens for Specific Situations – HIV-Infected Persons

HIV-Infected Persons

Consult an expert in managing HIV and TB

INH daily for 9-mo, rather than 6-mo, is optimal: 270 doses within 12 months

RIF is generally contraindicated for persons taking protease inhibitors or delavirdine

Rifabutin with dose adjustments can sometimes be substituted for RIF

INH/RPT regimen not recommended for HIV-infected people taking antiretroviral therapy

Slide 61: Latent TB Infection Treatment Regimens for Specific Situations – Fibrotic Lesions

Persons with Fibrotic Lesions Suggesting Previous TB

Should be treated for LTBI if they have

A positive TST reaction (at least 5 mm) or IGRA result

No symptoms of infectious TB disease

No history of treatment for TB disease

Treat only after active disease excluded with sputum testing

Acceptable regimens include

9 months of INH

4 months of RIF (with or without INH)

3 months of INH and RPT (12-dose regimen)

Slide 62: Latent TB Infection Treatment Regimens for Specific Situations – Multidrug-Resistant TB

Contacts of Persons with Multidrug-Resistant TB

Consider risk for progressing to MDR disease before recommending LTBI treatment

When prescribing treatment for these contacts, consult an MDR TB expert

Slide 63: Latent TB Infection Treatment Regimens for Specific Situations - Pregnancy

Pregnancy and Breast-Feeding

9 months of INH daily or twice weekly; give with vitamin B6

If cannot take INH, consult with TB expert

Women at high risk for progression to TB disease should not delay LTBI treatment; monitor carefully

Breast-feeding not contraindicated

Slide 64: Completion of Therapy

Completion of therapy is based on the total number of doses administered, not on duration alone.

Slide 65: Management of Patient Who Missed Doses

Extend or re-start treatment if interruptions were frequent or prolonged enough to preclude completion

When treatment has been interrupted for more than 2 months, patient should be examined to rule out TB disease

Recommend and arrange for DOT as needed

Slide 66: Monitoring Drug Treatment

Slide 67: Clinical Monitoring – 1

Instruct patient to report signs and symptoms of adverse drug reactions:

Fever

Headache

Rash

Anorexia, nausea, vomiting, or abdominal pain in right upper quadrant

Fatigue or weakness

Dark urine

Persistent numbness in hands or feet

Slide 68: Clinical Monitoring – 2

Monthly visits should include a brief physical exam and a review of:

Rationale for treatment

Adherence with therapy

Symptoms of adverse drug reactions

Plans to continue treatment

Slide 69: Clinical Monitoring – 3

Incidence of hepatitis in persons taking INH is lower than previously thought (as low as 0.1%)

Hepatitis risk increases with age

Uncommon in persons < 20 years old

Nearly 2% in persons 50 to 64 years old

Risk increases with underlying liver disease or heavy alcohol consumption

Slide 70: Laboratory Monitoring – 1

Baseline liver function tests (e.g., AST, ALT, and bilirubin) are not necessary except for patients with risk factors:

HIV infection

History of liver disease

Regular alcohol use

Pregnancy or in early postpartum period

Slide 71: Laboratory Monitoring – 2

Repeat laboratory monitoring if patient has:

Abnormal baseline results

Current or recent pregnancy

High risk for adverse reactions

Symptoms of adverse reaction

Liver enlargement or tenderness during examination

Slide 72: Laboratory Monitoring – 3

Asymptomatic elevation of hepatic enzymes seen in 10%-20% of people taking INH

Levels usually return to normal after completion of therapy

Discontinue treatment if transminase level exceeds 3 times the upper limit of normal if patient has symptoms of hepatoxicity, and 5 times the upper limit of normal if patient is asymptomatic

Slide 73: Meeting the Challenge of TB Prevention

For every patient:

Assess TB risk factors

If risk is present, perform TST or IGRA

If TST or IGRA is positive, rule out TB disease

If TB disease is ruled out, initiate treatment for LTBI

If treatment is initiated, ensure completion

Slide 74: Additional Resources

Targeted Tuberculin Testing and Treatment of Latent Tuberculosis Infection. MMWR 2000; 49 (No. RR-6)(http://wwwdev.cdc.gov/mmwr/preview/mmwrhtml/rr4906a1.htm)

Recommendations for Use of an Isoniazid–Rifapentine Regimen with Direct Observation to Treat Latent Mycobacterium tuberculosis

Infection(http://wwwdev.cdc.gov/mmwr/preview/mmwrhtml/mm6048a3.htm?s_cid=mm6048a3_w)

CDC TB Website(http://wwwdev.cdc.gov/tb/default.htm)

Latent Tuberculosis Infection: A Guide for Primary Health Care Providers

Slide 75: Additional TB Guidelines Available Online

CDC's Morbidity and Mortality Weekly Report

http://www.cdc.gov/tb/publications/reportsarticles/mmwr/default.htm

American Thoracic Society

http://www.thoracic.org/statements/

U.S. Preventive Services Task Force

http://www.uspreventiveservicestaskforce.org/Page/Document/UpdateSummaryDraft/latent-tuberculosis-infection-screening

Bright Futures Recommendations for Pediatric Preventive Health Care

https://www.aap.org/en-us/Documents/periodicity_schedule.pdf

Slide 76: Case Studies

Slide 77: Case Study A (1)

Patient History

No symptoms of TB disease

Normal CXR, CBC, AST, and bilirubin

Slide 78: Case Study A (2)

Questions

What are this patient's risk factors for TB infection or disease?

Has the management of this patient to date been appropriate?

Slide 79: Case Study A (3)

Discussion of risk factors

Patient is a contact of an infectious TB case

Recent immigrant to the US from a country with a high prevalence of TB

If the patient had not been a contact, the recency of his immigration (less than 5 years) would have made him a candidate for TB testing, but the 5-mm reaction would not be considered positive

Slide 80: Case Study A (4)

Discussion of risk factors

Persons who immigrate from TB-endemic countries have increased rates of TB

Rates of TB approach those of their countries of origin for 5 years after arrival in the U.S.

These increased rates most likely result from recent M. tuberculosis infection in their native country

Slide 81: Case Study A (5)

Discussion of management

As a contact of an active TB case, 5 mm of induration is considered positive

This patient should have been treated for LTBI immediately after the first TST

Slide 82: Case Study B (1)

Patient History

24-year-old Asian female

Moved to U.S. from Philippines > 5 years ago

Plans to work in a correctional facility

TST result negative (0 mm) 1 year ago

TST for pre-employment physical = 26 mm of induration

CXR normal

No symptoms of TB disease

No known contact with a TB patient

Slide 83: Case Study B (2)

Questions

What are this patient's risk factors for TB infection or disease?

What is the appropriate management for this patient?

Slide 84: Case Study B (3)

Discussion of risk factors

Patient's TST converted from negative to positive (within a 2-year period)

TST conversion increases risk for progressing from LTBI to TB disease

Foreign-born status is less of a risk factor, i.e., she immigrated more than 5 years ago

Slide 85: Case Study B (4)

Discussion of management

Patient's TST conversion indicates failure to identify this person as high risk for recent exposure to TB

Patient may have had extended travel to her country of origin or other high-prevalence parts of the world

Patient is a recent converter and, as such, is a candidate for treatment of LTBI with INH

Slide 86: Case Study C (1)

Patient History

28-year-old Asian male

Moved to U.S. from China < 5 years ago

Received BCG vaccine in China as a child

QFT-GIT result = Positive

CXR normal

No symptoms of TB disease

Known contact with a TB patient

Slide 87: Case Study C (2)

Questions

What are this patient's risk factors for TB infection or disease?

What is the appropriate management for this patient?

Slide 88: Case Study C (3)

Discussion of risk factors

Positive QFT-GIT result suggests that M. tuberculosis infection is likely (result is not affected by prior BCG vaccination)

Recent immigrant to the US from a country with a high prevalence of TB

Foreign-born status is a risk factor, i.e., he immigrated < 5 years ago

Known contact with a TB patient

Slide 89: Case Study C (4)

Discussion of management

Patient recently immigrated from a TB endemic country, positive QFT-GIT result may be indicative of LTBI

Contact with a TB patient could have been source of infection

Should be treated for LTBI