# Slide 1:

Medical Update

TB Technical Instructions for Panel Physicians: Implications for US-Practitioners

November 28, 2012

There is the logo of the New Jersey Medical School Global Tuberculosis Institute.

There is a photo of an immigration officer with an airplane in the background.

Sponsored by the New Jersey Medical School Global Tuberculosis Institute

# Slide 2:

# Objectives

## Upon completion of this seminar, participants should be able to:

## Describe the purpose and use of the TB technical instructions in the medical evaluation of persons emigrating to the United States (US)

## List the changes to the TB technical instructions to clarify their use in the examination of immigrants and refugees

## Explain how to implement the TB technical instructions to appropriately provide related medical consultation

## Apply the TB technical instructions to the medical follow-up of immigrants and refugees arriving in the US

# Slide 3:

# Faculty

## Phil Lowenthal, MPH

## Tuberculosis Control Branch

## California Department of Public Health

## Sundari Mase MD, MPH Field Services and Evaluation Branch Division of Tuberculosis Elimination Centers for Disease Control and Prevention

## Drew L. Posey, MD, MPH

## Immigrant, Refugee, and Migrant Health Branch

## Division of Global Migration and Quarantine

## Centers for Disease Control and Prevention

# Slide 4:

# Agenda

## Background and Overview of Technical Instructions

## —*Sundari Mase, MD, MPH*

## Implementation and Roll Out of Technical Instructions

## —*Drew Posey, MD, MPH*

## Case Presentations

## *Sundari Mase, MD, MPH*

## Discussion

# Slide 5:

# Why Were the Tuberculosis Technical Instructions (TI) Updated?1991 Versus Culture and Directly Observed Therapy Tuberculosis TI (formerly 2007 TB TI)

## Sundari Mase MD, MPH

## Medical Team Lead

## CDC/DTBE/FSEB

## Division of Global Migration and Quarantine/Division of TB Elimination

**Slide 6:**

Learning Objectives

After this session, you should be able to:

* Describe reasons for changing from 1991 to Culture and Directly Observed Therapy TB Technical Instructions (2007) TI
* List changes in Culture and Directly Observed Therapy TB technical Instructions (2007)

**Slide 7:**

# Background

## Each year, approximately 400,000 immigrants and 50,000 refugees enter the United States

## The Division of Global Migration and Quarantine (DGMQ) has regulatory authority to stipulate the requirements of the overseas medical examination via Technical Instructions

## The Bureau of Populations, Refugees, and Migration (BPRM) is the State Department bureau responsible for refugee resettlements

## BPRM has contracted the International Organization for Migration (IOM) to perform the medical screening for approximately 80% of the refugees.

## The initial Technical Instructions for Tuberculosis (TB TI) was issued in 1991

**Slide 8:**

# Rationale for Overseas Screening and Domestic Follow-up

## Overseas Panel Physicians screen TB suspects using DGMQ TIs

### Restrict entry of infectious TB cases

### Facilitate entry of the rest to allow U.S. entry, evaluation and treatment per ATS/CDC standards

## US Health Department follow-up evaluation and treatment of noninfectious cases is cost-effective

**Slide 9:**

# Background – Hmong Outbreak

## December 2003, the U.S. Department of State approved resettlement of over 15,000 Laotian Hmong refugees to the United States.

## Medical screening started in February 2004 and refugees began arriving June 2004

## January 2005

### CDC notified of 31 active TB cases in CA out of 5837 refugees (case rate = 700/100,000); 50% of culture confirmed cases (7) MDR-TB

### Resettlement halted

### Investigations Thailand and California

# Slide 10:

There is a photo of a refugee camp.

**Slide 11:**

# TB Technical Instructions (TI)

# Slide 12:

Table with title, 1991 TI

There are 2 columns; the left column is labeled as procedure and the right column is labeled as 1994 TB TI.

First row: The procedure is skin test (TST) and is not in the 1991 TB TI

Second row: The procedure is chest x-ray and in the 1991 TB TI it is for those greater than or equal to 15 years of age.

Third row: The procedure is laboratory and the 1991 TB TI has limited requirements.

Fourth row, the procedure is TB treatment and in the 1991 TB TI, DOT is not necessary.

**Slide 13:**

This is an algorithm titled 1991 TI: TB evaluation forapplicants greater than or equal to 15 years of age. It starts with performing a chest radiograph. If the chest radiograph shows inactive TB, the patient is considered as Class B2. He or she has travel valid for 6 months. If smears are negative then the patient is considered non-infectious and class B1. If the chest radiograph shows active TB, 3 AFB smears are done. If all of the smears are negative, the patient is considered to be non-infectious, class B1. If at least one smear is positive, the patient is considered to be infectious class A. There is a limited treatment requirement with no DOT and a class A waiver. If the chest radiograph shows no TB, the patient is in no class, and has travel valid for 12 months.

**Slide 14:**

# Technical Instruction Revision

## CDC began revising TB portion of 1991 TI in 2005

## Scientific literature reviewed

## Input from U.S. Tuberculosis Community (TB TI Working Group):

### Advisory Council for the Elimination of Tuberculosis (ACET)

### National Tuberculosis Controllers Association (NTCA)

### STOP TB USA

**Slide 15:**

# World-Wide TB Statistics

* 1/3 of world infected
* 9.3 million cases of active TB
* 138 million deaths

**Slide 16:**

World map titled, Estimated TB Incidence rates, 2010

There is a caption at the bottom of the picture that says: The boundaries and names shown and the designations used on this map do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city, or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted lines on maps represent approximate border lines for which there may not yet be full agreement.

Source: Global Tuberculosis Control 2011. WHO, 2011. Copyright WHO 2011. All rights reserved.

The map shows 0 to 24 estimated TB cases per hundred thousand in the United States, Canada, Mexico, Iceland, the Caribbean with the exception of the Dominican Republic, Australia, Saudi Arabia, Japan, Egypt, Chile, Uruguay, and most of Western Europe. There are 25 to 49 estimated cases per 100,000 in Latin America, Libya, Yemen, Brazil, Columbia, Venezuela, Paraguay, Portugal, Argentina, and Haiti. There are 50 to 99 estimated TB cases per hundred thousand in China, South Korea, Morocco, Algeria, Mali, Burkina Faso, Rwanda, Burundi, Ghana, Iraq, Uzbekistan, Sri Lanka, Brunei, Bosnia and Herzegovina, and Laos. There are 100 to 299 estimated TB cases per hundred thousand in Russian Federation, Senegal, Ghana, Cote d’Ivoire, Niger, Chad, Sudan, Eritrea, Ethiopia, Somalia, Uganda, Kenya, UR Tanzania, Madagascar, Malawi, India, Pakistan, Bangladesh, Nepal, Burma, Bhutan, Indonesia, Malaysia, New Guinea (Indonesia), Borneo, Vietnam, Philippines, Thailand, Kazakhstan, Mongolia, Tajikistan, Turkmenistan, Kyrgyzstan, and Afghanistan. There are greater than or equal to 300 estimated TB cases per hundred thousand in New Guinea, North Korea, Cambodia, Philippines, Djibouti, Togo, Mauritania, Central African Republic, Gabon, Congo, DR Congo, Angola, Zambia, Mozambique, Namibia, Botswana, Swaziland, Lesotho, South Africa, and Zimbabwe. There is no estimate of a case rate for Greenland.

**Slide 17:**

Bar and line graphs titled, Tuberculosis Cases, United States, 1993-2009.

The graph shows that US-born cases have declined between 1993-2009 from about 18,000 cases to about 4,000 cases. Foreign-born cases have fluctuated slightly but have been around 8,000 cases each year. The percent of total cases which are foreign-born has increased over time from about 30% to 60%.

# Slide 18:

# Vietnam Immigrant Study

## Performed on U.S. immigrant applicants using 1991 Technical Instructions AND TB cultures

## 1,179 abnormal chest radiographs

### 82 (7%) positive sputum smears

### 183 (15.5%) positive sputum cultures

## Sensitivity of 1991 Technical instructions

### 34%

## Missing ~ 2/3 of TB cases (culture as gold standard)

The footnote reads: Maloney SM, et al. Arch Intern Med 2006; 166:234-40.

# Slide 19:

# TI Revision Collaborators

## U.S. Department of State

## CDC Division of Tuberculosis Elimination (DTBE)

## U.S. Agency for International Development (USAID)

## International Organization for Migration (IOM)

## Ministries of Health

## Other countries performing overseas pre-immigration tuberculosis screening

## Panel physicians

## Applicants

There are logos of the United States Department of State, USAID, CDC, and IOM.

# Slide 20:

# Culture and DOT TB TI

Changes

## Tuberculin skin test or interferon gamma release assay (IGRA) in applicants 2-14 years of age in countries with World Health Organization (WHO)-estimated incidence rate of ≥20 per 100,000

### Country of examination

### CXR required if TST ≥ 10 mm or IGRA positive

## Three sputum cultures (and smears) required for applicant with abnormal chest radiograph

# Slide 21:

# Culture and DOT TB TI

Changes

## Drug susceptibility testing (DST) on positive cultures

## Directly observed therapy (DOT) according to ATS/CDC/IDSA guidelines for pansusceptible smear or culture-positive applicants

### Curry Center guidelines for drug-resistant TB cases

## Reduced validity period of medical examination

### 3 months if Class B1 TB or HIV

#### From date culture result reported

### 6 months otherwise

#### For No TB Class, or Class B2 or B3 TB

#### From date of physical examination

# Slide 22:

# Culture and DOT TB TI

## Children 10 years of age or less may travel while TB cultures are pending

### If do not meet specific criteria that correlate with infectiousness

### B1 TB classification

## Applicants who undergo TB treatment at a non-CDC approved site must

### Provide specific treatment documentation

### Wait 1 year post-treatment to undergo a repeat immigration medical examination

###

## **Slide 23:**

# No treatment equals no travel (Remain Class A for TB)

**Slide 24:**

# Culture and Directly Observed Therapy TB TI (formerly 2007 TB TI)WHO Incidence ≥20/100,000

# Slide 25:

# Algorithm titled: 2007 TB TI: Ages 2-14 WHO TB Incidence ≥20/100,000

If the patient is 2 through 14 years of age and you do a TST or IGRA and the result is a TST of less than 10 millimeters or IGRA is negative, there is no classification and the patient can travel within 6 months. If the TST is greater than or equal to 10 millimeters do a chest x-ray. If the chest x-ray is normal, the patient is considered class B2 and should have an LTBI evaluation and can travel within 6 months. Those who are HIV infected who have three negative smears and cultures are “no class” for TB and class B other, HIV infection. They must travel within 3 months of the date the culture result is reported.

If the chest x-ray is suggestive of TB, the patient has signs or symptoms of TB, or HIV infection, there should be three sputum smears and cultures for *Mycobacterium tuberculosis*. If there is at least one positive smear or culture, the patient has class A TB. If any of the smears cultures positive, then drug susceptibility testing should be performed on the positive culture and the patient would need to be treated according to ATS/CDC/IDSA guidelines by directly observed therapy until therapy is complete and then can travel within the three-month period. If all of the smears and cultures were negative, then the patient has class B1 TB and then could travel within the three-month period.

**Slide 26:**

# Algorithm titled: 2007 TB TI: Age > 15

For patients greater than or equal to 15 years of age, do a chest x-ray. If the chest x-ray is normal, the patient has no TB classification and can travel within 6 months. Those who are HIV infected who have three negative smears and cultures are no class for TB and class B other, HIV infection. They must travel within 3 months of the date the culture result is reported.

If the chest x-ray was suggestive of TB, the patient has signs or symptoms of TB, or HIV infection, there should be three sputum smears and cultures for *Mycobacterium tuberculosis*. If there is at least one positive smear or culture, the patient has class A TB. If any of the smears cultures positive, then drug susceptibility testing should be performed on the positive culture and the patient would need to be treated to ATS/CDC/IDSA guidelines by directly observed therapy until therapy is complete and then could travel within the three-month period. If all of the smears and cultures were negative, then the patient has class B1 TB and then could travel within the three-month period.

**Slide 27:**

# Algorithm titled: 2007 TB TI WHO TB Incidence ≥20/100,000

This slide show the algorithms from slides 25 and 26 combined on one slide.

**Slide 28:**

# Algorithm titles: Culture and Directly Observed Therapy TB TI (formerly 2007 TB TI)

If the TB rate is >20 per 100,000, persons 2- to 14 years of age, children between two and 14 would have TST or interferon gamma release assay; if it was positive then a chest x-ray.

If the patient was HIV infected or had TB signs or symptoms, he or she would get a chest x-ray and if it is abnormal, would have three sputum smears and cultures. If all smears and cultures are negative, the are Class B1, if one or more are positive, considered to be Class A and they’d have DOT, treatment under Directly Observed Therapy until cured. They could potentially qualify for a Class A waiver which when we listen to the cases I'll get into that.

# Slide 29:

# Culture and Directly Observed Therapy TB TI (formerly 2007 TB TI) Classifications

Table with 2 columns labeled Class and Status.

First row one reads class as no classification and status as normal.

Second row read class as A and status as tuberculosis disease.

Third row read class as B1 pulmonary and status as abnormal chest x-ray.

Fourth row reads class as B1 extrapulmonary and status as extrapulmonary tuberculosis.

Fifth row read class as B2 and status as LTBI evaluation.

Sixth row reads class B3 and status as contact evaluation.

**Slide 30:**

# DOT Definition

## DOT

### Is an adherence-enhancing treatment strategy

### Standard of care for TB treatment in which a trained health care worker monitors the TB patient as he takes each dose of anti-TB medication.

## Under the Culture and DOT TB TI, DOT must be administered when tuberculosis disease (Class A TB) is present.

### Smear or culture positive

### Clinical diagnosis (minority of cases)

# Slide 31:

# Table titled 1991 vs. Culture and DOT (2007) TB TI

# There are 3 columns labeled procedure, 1991 TB TI and 2007 TB TI

# Row 1: Skin test or IGRA is not in the 1991 TB TI. In the 2007 TB TI, it is for persons 2 through 14 years of age if the country TB rate is greater than or equal to 20 per 100,000

# Row 2: Chest x-ray in the 1991 TB TI is for persons greater than or equal to 15 years of age. In the 2007 TB TI it is for persons greater than or equal to 15 years of age or if the tuberculin skin test is greater than or equal to 10 millimeters or IGRA is positive

Row 3: For laboratory procedures, in the 1991 TB TI, smears were required and in the 2007 TB TI smears and culture and drug susceptibility testing are required.

Row 4: TB treatment in the 1991 TB TI is not required by DOT and in the 2007 TB TI it required is by DOT using US guidelines until therapy is completed.

Row 5: The validity period of the TB part of the exam is the 1991 TB TI is 6 months for class A or class B TB. In the 2007 TB TI validity is shorter.

**Slide 32:**

# Table titled 1991 vs. Culture and DOT (2007) TB TI: Classifications

# There are 3 columns labeled class, 1991 TB TI, and 2007 TB TI

Row 1: There is no classification if the evaluation is normal under both TB TIs.

Row 2: Class is A if there is tuberculosis disease under both TIs.

Row 3: Under the 1991 TB TI, class is B1 pulmonary if there is an abnormal chest x-ray and sputum smears are negative. Under the 2007 TB TI, class is B1 pulmonary if there is an abnormal chest x-ray and sputum smears and cultures are negative.

Row 4: Class is B1 extrapulmonary if there is extrapulmonary tuberculosis under both TB TIs.

Row 5: Under 1991 TB TI, class is B if there is inactive tuberculosis on chest x-ray. Under the 2007 TB TI, class is B2 if there is an LTBI evaluation.

Row 6: Under 1991 TB TI, class is B3 if there is old, healed tuberculosis. Under 2007 TB TI, class is B3 if there is a contact evaluation.

**Slide 33:**

# Key Points to Remember

## The Culture and DOT TB TI are designed to:

### Improve overseas TB detection

### Decrease importation of TB into the U.S.

## Panel Physicians will be clearly informed by the Consular Section *before* the Culture and DOT TB TI (formerly 2007 TB TI) implementation begins in the country

### Implementation must be uniform

#### All components of TI

#### All panel physicians within country

#### All parties and agencies require notice

**Slide 34:**

# Culture and Directly Observed Therapy Tuberculosis Technical Instructions (formerly 2007 TB TI) can be found online at: http://www.cdc.gov/immigrantrefugeehealth/exams/ti/panel/tuberculosis-panel-technical-instructions/html

**Slide 35:**

# Acknowledgements

## Drew Posey, MD

## Mary Naughton, MD

## Courtney Godwin

# Slide 36:

# Thank You.

# Slide 37:

# Implementation & Roll Out of the Technical Instructions

## November 28, 2012

## Drew L. Posey, MD, MPH

## Team Leader, Medical Assessment and Policy

## Immigrant, Refugee, and Migrant Health Branch

## Division of Global Migration and Quarantine

## Centers for Disease Control and Prevention

**Slide 38:**

## Phased implementation plan based on:

### Number of immigrants and refugees arriving in U.S. from the country

### Country’s TB rate

### Country’s contribution to U.S. TB rate

## Benefits in country:

### Develops culture and DOT infrastructure

### Links panel physician programs with broader control efforts

## Benefits to the United States:

### Helps to lower TB rate, reduce transmission

## **Slide 39:**

# Legal Permanent Resident (LPR) Flow, United States, 1900 – 2011

## U.S. LPR (2011): 1,062,040

## Status adjusters: 481,948 (55%)

## Entrants (screened overseas for TB): 580,092 (45%)

## Entrants with a B classification: 22,215 (4%)

There is a graph showing years from 1900 to 2011 on the x-axis and numbers of people in millions from 0 to 2. In 1900 there were about .5 million legal permanent residents. In 1905 there were about 1.3 million legal permanent residents. In 1910 there were about 1 million legal permanent residents. In 1915 there were about 1.2 million legal permanent residents. In 1920 there were about .1 million legal permanent residents. Between 1920 and 1930 there were 2 peaks of legal permanent residents of about .8 and .7 million. Then the numbers drop to almost 0 in 1940. There is a steady increase from 1945 to about 1985 from 0 to .6 million then a sudden increase to 1.9 million in 1990. Then the numbers drop to about .6 million in 2000 and then up to 1.3 million in 2011. The source of this data is the US Department of Homeland Security.

## **Slide 40:**

# Scope of Implementation

## There are 369 panel sites located in 151 jurisdictions

## CDOT has been implemented in 64 jurisdictions

## 620 panel physicians world-wide

## CDC visits ~20 countries per year

The map shows the list of the panel sites which include:

|  |
| --- |
| * Buenos Aires, Argentina
 |
| * Baku , Azerbaijan
 |
| * Nassau and Grand Bahama, Bahamas
 |
| * Dhaka, Bangladesh
 |
| * Belize City, Belize
 |
| * St. George's and Paget, Bermuda
 |
| * Gaborone, Botswana
 |
| * Santa Cruz, Cochabamba, and La Paz, Bolivia
 |
| * Phnom Penh, Cambodia
 |
| * Yaounde, Cameroon
 |
| * Vancover, Toronto, and Montreal, Canada
 |
| * Santiago, Chile
 |
| * Beijing, Guangzhou, Fuzhou, and Shanghai , China
 |
| * Bogota , Colombia
 |
| * San Jose , Costa Rica
 |
| * Santo Domingo, Dominican Republic
 |
| * Guayaquil, and Quito Ecuador
 |
| * Cairo and Alexandria, Egypt
 |
| * San Salvador , El Salvador
 |
| * Addis Ababa , Ethiopia
 |
| * Paris , France
 |
| * Bakau , The Gambia
 |
| * Tbilisi, Georgia
 |
| * Accra , Ghana
 |
| * Guatemala City, Guatemala
 |
| * Georgetown, Guyana
 |
| * Port Au Prince, Haiti
 |
| * Comayaguela and Tegucigalpa Honduras
 |
| * Hong Kong, Hong Kong SAR
 |
| * Surat, Kolkata, Chennai, Ahmedabad, Hyderabad, Mumbai, New Delhi, Ludhiana, and Mohali, India
 |
| * Jakarta, Indonesia
 |
| * Dublin, Ireland
 |
| * Kobe City and Tokyo Japan
 |
| * Amman, Jordan
 |
| * Nairobi , Kenya
 |
| * Kuala Lumpur, Kuching, and Penang Malaysia
 |
| * Majuro, Marshall Islands
 |
| * Nouakchott, Mauritania
 |
| * Ciudad Juarez and Mexico City, Mexico
 |
| * Maputo, Mozambique
 |
| * Windhoek, Namibia
 |
| * Kathmandu, Nepal
 |
| * Amsterdam, Netherlands
 |
| * Managua, Nicaragua
 |
| * Lagos , Nigeria
 |
| * Manila, Philippines
 |
| * Kigali, Rwanda
 |
| * Dakar, Senegal
 |
| * Singapore, Singapore
 |
| * Bratislava, Slovakia
 |
| * Ljubljana, Slovenia
 |
| * Durban, Johannesburg, and Cape Town South Africa
 |
| * Seoul, South Korea
 |
| * Madrid, Spain
 |
| * Paramaribo, Suriname
 |
| * Kaohsiung, Feng Yuan City, and Taipei , Taiwan
 |
| * Dar es Salaam, Tanzania
 |
| * Bangkok, Thailand
 |
| * Istanbul and Ankara Turkey
 |
| * Kampala, Uganda
 |
| * Montevideo, Uruguay
 |
| * London, United Kingdom
 |
| * Ho Chi Minh City Vietnam
 |

# Slide 41:

# Implementation of CDOT TB Technical Instructions (2007-present)

## 64 countries now under CDOT TB TIs

### Currently, 77% of immigrant visa entrants screened under CDOT TB TIs

### 77% of U.S.-diagnosed foreign-born cases from countries where TB TI have been implemented

### 90% of persons with TB notifications are from countries where TB TI have been implemented

# Slide 42:

World map show countries with panel sites and countries from which applicants are coming. As of the writing of this text, all of the following countries can accept all applicants for screening:

|  |
| --- |
| * Argentina
 |
| * Azerbaijan
 |
| * Bahamas
 |
| * Bangladesh
 |
| * Belize
 |
| * Bermuda
 |
| * Bolivia
 |
| * Botswana
 |
| * Burundi
 |
| * Cambodia
 |
| * Cameroon
 |
| * Canada
 |
| * Central African Republic
 |
| * Chad
 |
| * Chile
 |
| * China
 |
| * Colombia
 |
| * Comoros Islands
 |
| * Costa Rica
 |
| * Dominican Republic
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| * Ecuador
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| * Egypt
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| * El Salvador
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| * Eritrea
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| * Ethiopia
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| * Equatorial Guinea
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| * France
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| * The Gambia
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| * Georgia
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| * Ghana
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| * Guatemala
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| * Guyana
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| * Haiti
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| * Honduras
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| * Hong Kong SAR
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| * Slovakia
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| * Slovenia
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| * Somalia
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| * South Africa
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| * South Korea
 |
| * South Sudan
 |
| * Spain
 |
| * Suriname
 |
| * Swaziland
 |
| * Taiwan
 |
| * Tanzania
 |
|
| * Thailand
 |
| * Turkey
 |
| * Uganda
 |
| * United Kingdom
 |
| * Uruguay
 |
| * Vietnam
 |

**Slide 43:**

# Site Visit Strategy

## Evaluate and teach panel physicians

## Inspect candidate laboratories

## Inspect candidate DOT sites

## Meet with tuberculosis officials

### National Tuberculosis Programs (NTP), etc.

## Educate Consular Section staff members

## Develop implementation plan

## Focused follow-up

# Slide 44:

# Laboratory Testing

There are 3 photos on this slide

Picture 1: Technician visually examining a specimen outdoors

Picture 2: BACTEC MGIT 960

Picture 3: A microscope and a laser printer on a desk.

**Slide 45:**

# Laboratory Challenges

## NTPs’ lack of requirements for cultures

## Lack of culture laboratories

## Lack of quality culture laboratories

## Lack of second line drug susceptibility testing (DST)

# Slide 46:

# Laboratory Capacity Building

## New laboratories

### China (5), India (5), Kenya, Malaysia, Mexico, Nepal, Thailand (2), Vietnam

## Greatly expanded laboratories

### Dominican Republic, Ethiopia, Ghana, India (2)

## Laboratories performing 2nd line DST

### China (Guangzhou), Kenya, Mexico, Nepal, Thailand, Vietnam

**Slide 47:**

# TB Treatment Programs

Picture 1: Man drinking a glass of water from the plastic cup and standing inside a slatted wooden structure

Picture 2: Three men standing at a desk pointed at entries in a handwritten record book.

# Slide 48:

# Treatment Challenges

## DOT may not exist

## First-line therapy

### NTP adherence to 8-month regimen (no longer recommended by WHO)

## Second line drugs

### Limited manufacturers

### Limited supplies of quality-assured drugs

### Some drugs very expensive

### Some countries have import restrictions

## MDR TB expertise lacking, GLC issues

# Slide 49:

# Linkages

## Public-private partnerships

### Dominican Republic

#### Treatment coordination

#### Training of NTP staff

### International Organization for Migration (IOM)

#### Addis Ababa and Ho Chi Minh City

##### Assists with importation of 2nd line drugs

#### Nairobi

##### Close cooperation with NTP

## Specimen testing for local NGOs

### Mexico

#### Cultures for Project Juntos

## Engagement with global tuberculosis community

### IOM

#### TB Reach awards to increase MDR TB capacity in Ethiopia, Thailand

#### Participation in tuberculosis meetings in Geneva

## Intergovernmental coordination

### Nepal

#### Camp-wide tuberculosis program managed by IOM

## NTP played leadership role with implementation

### El Salvador

# Slide 50:

# Education Program

## Basic tuberculosis education

### Regional Training and Medical Consultation Centers (RTMCC) “Clinical Intensive” courses

#### Attended by >50 panel physicians since 2009

## Training Summits – 9 beginning 2008

### International Panel Physicians Association partnership

### Cellestis co-sponsor

## Webinars

### Seven conducted beginning 2010

### Accessible through LinkedIn

## Panel Physicians Portal: http://www.cdc.gov/panelphysicians/index.html

## Online training modules

## Consular training

# Slide 51:

# Blank world map titled Regional Panel Physician Trainings, 2008-2012 –Countries Represented.

# Slide 52:

World map titled Regional Panel Physician Trainings, 2008-2012 –Countries Represented. 2008. The countries Mexico, Egypt, Jordan, Syria, and Iraq are colored red.

**Slide 53:**

World map titled Regional Panel Physician Trainings, 2008-2012 – Countries Represented. 2009. The countries Mexico, Egypt, Jordan, Syria, Australia, China, India, Nicaragua, Ethiopia, Uganda, Tanzania, Kenya, Haiti, Philippines, Vietnam, Cambodia, Thailand, and Iraq are colored red.

**Slide 54:**

World map titled Regional Panel Physician Trainings, 2008-2012 – Countries Represented. 2010. The countries Canada, Mexico, Egypt, Jordan, Syria, Australia, China, India, Pakistan, Afghanistan, Nicaragua, Ethiopia, Uganda, Tanzania, Kenya, Haiti, Philippines, Vietnam, Cambodia, Thailand, Brazil, Peru, Ecuador, Colombia, Cote d’Ivoire, Ghana, Guinea, Nigeria, Cameroon, and Iraq are colored red.

**Slide 55:**

World map titled Regional Panel Physician Trainings, 2008-2012 – Countries Represented. 2011. The countries Russia, Argentina, Venezuela, Guatemala, El Salvador, Honduras, Costa Rica, Panama, Indonesia, Malaysia, Japan, South Korea, the United Kingdom, Finland, Borneo, Sweden, Canada, Mexico, Egypt, Jordan, Syria, Australia, China, India, Pakistan, Afghanistan, Nicaragua, Ethiopia, Uganda, Tanzania, Kenya, Haiti, Philippines, Vietnam, Cambodia, Thailand, Brazil, Peru, Ecuador, Colombia, Cote d’Ivoire, Ghana, Guinea, Nigeria, Cameroon, and Iraq are colored red.

**Slide 56:**

World map titled Regional Panel Physician Trainings, 2008-2012 – Countries Represented. 2012. The countries Russia, Argentina, Venezuela, Guatemala, El Salvador, Honduras, Costa Rica, Panama, Indonesia, Malaysia, Japan, South Korea, the United Kingdom, Finland, Belarus, Latvia, Austria, Slovakia, France, Lithuania, Borneo, Sweden, Canada, Mexico, Egypt, Jordan, Syria, Australia, China, India, Pakistan, Afghanistan, Nicaragua, Ethiopia, Uganda, Tanzania, Kenya, Haiti, Philippines, Vietnam, Cambodia, Thailand, Brazil, Peru, Ecuador, Colombia, Cote d’Ivoire, Ghana, Guinea, Nigeria, Cameroon, and Iraq are colored red.

**Slide 57:**

# RTMCC ConsultationsOctober 1, 2010 – September 30, 2012

# Cooperative agreement

* SNTC led effort to develop system
* RTMCC also provided
	+ Printed materials for summits

# MDR TB expert to Lima and Istanbul summits

# There is a table listing countries with number of consultations and number specifically for MDR TB and XDR TB.

Row 1: Burma has had 1 consultation and 0 for MDR and XDR TB.

Row 2: Cameroon has had 2 consultations and 0 for MDR and XDR TB.

Row 3: Ethiopia has had 7 consultations with 1 for MDR and 0 for XDR TB.

Row 4: Haiti has had 2 consultations and 0 for MDR and XDR TB.

Row 5: Japan has had 1 consultation and 0 for MDR and XDR TB.

Row 6: Kenya has had 1 consultation with 1 for MDR and 0 for XDR TB.

Row 7: Mexico has had 3 consultations with 1 for MDR and 0 for XDR TB.

Row 8: Nepal has had 7 consultations with 3 for MDR and 1 for XDR TB.

Row 9: Philippines has had 3 consultations and 0 for MDR and XDR TB.

Row 10: Russia has had 2 consultations with 2 for MDR and 0 for XDR TB.

Row 11: Thailand has had 10 consultations with 7 for MDR and 1 for XDR TB.

Row 12: Vietnam has had 6 consultations with 4 for MDR and 0 for XDR TB.

The total number of consultations is 53 with 20 for MDR TB and 2 for XDR TB.

# Slide 58:

# Evaluation and Monitoring

## Follow-up visits when needed

## ACET/NTCA evaluations

### 2007 – IOM Thailand

### 2008 – Manila, Philippines

### 2009 – IOM Nepal

### 2010 – Ho Chi Minh City, Vietnam

### 2012 – Santo Domingo, Dominican Republic

# Slide 59:

Bar graph titled: Saint Luke’s Extension Clinic (SLEC)
FY 2007 (52,530 applicants, 1991 TB TI) vs. FY 2008 (41,793 applicants, 2007 TB TI)

The number of applicants with pulmonary TB with the 2007 Technical Instructions is 505 versus 291 with the 1991 Technical Instructions

There were 102 smear and culture positive patients with the 2007 Technical Instructions versus 95 with the 1991 Technical Instructions.

There were 93 smear positive and culture negative patients with the 2007 Technical Instructions versus 75 with the 1991 Technical Instructions.

There were 306 smear negative and culture positive patients with the 2007 Technical Instructions versus 0 with the 1991 Technical Instructions.

There were 4 smear negative and culture negative patients with the 2007 Technical Instructions versus 0 with the 1991 Technical Instructions.

With the 1991 Technical Instructions, there were 121 smear negative patients with no culture done. There were no such patients with the 2007 Technical Instructions.

The TB case detection rate with the 1991 TB TI was 554 per 100,000 versus 1,208 per 100,000 with the 2007 TB TI.

# Slide 60:

# Bar graph titled CDC Immigration Requirements: Reduced TB Importation – California

This shows B1 and B2 arrivers from Mexico using the 1991 TB TI and B1 arrivers from Philippines and Vietnam using the 2007 TB TI. The TB notification in arrivals fluctuated slightly between the years 2000 and 2006 between 2000 and 2400 persons. It rose to about 2800 in 2007 and 2008 and then increased again to about 3000 in 2009 and then 2010.

The percent of these notifications reported as TB cases remained steady between 2002 and 2005 at about 4 percent. It peaked in 2006 at around 5.4 percent. Then the percentage of TB case dropped to about 1.5 percent in 2008, 1 percent in 2009 and was at 1.5 percent in 2010.

# Slide 61:

# Progress in Prevention: TB in MN

## Since implementation of the new TB technical instructions in 2007, and gradual expansion worldwide, the number of TB cases in MN among newly arrived refugees and immigrants has dropped significantly:

## The percent diagnosed at less than 12 months in 2008 was 20% versus 12% in 2010 with a 40% decrease.

## The percent diagnosed at 1 to 2 years in 2008 was 23% versus 9% in 2012 with a 61% decrease.

##

## The source for this information is the MDH Disease Control Newsletter. Volume 39, Number 1, January through August, 2010.

# Slide 62:

# Impact on US Domestic Tuberculosis Control

## Cost Savings to US domestic programs

## Diagnose ≈1,000 applicants each year in Culture and DOT TB programs

## If 4% MDR TB: 40 MDR TB patients yearly

## Cost of treating cases in United States

### Pansusceptible: ≈$13,000(this information is from Holland, et al, in American Journal of Respiratory and Critical Care Medicine from 2009. Volume 179 pages1055-1060)

### MDR TB: $50,000 - >$500,000

## Savings to US health departments

### $13 Million - >$30 Million

## **Slide 63:**

# TB TI Implementation Closeout

## One global standard for screening requirements

## Complete gains in US TB control among foreign-born

## CDC leadership in global tuberculosis control

## Closeout strategy for all programs to be screening by October 1, 2013 (FY 2014)

# Slide 64:

# Culture and DOT TB TI Deadline

## Department of State cable issued August 30, 2012

## Panel physicians worldwide should

### Begin screening according to the CDOT TB TI as soon as able

### No later than October 1, 2013

There is a picture of the cable with the stated information.

# Slide 65:

# Selection of October 1, 2013

## Provides concrete end to implementation plan

## Achievable, given progress that has been made thus far

## Provides implementing countries 12 months to transition (at time of announcement)

## Beginning of a new fiscal year for the U.S. government

# Slide 66:

# FY 2013 Plans

## Aggressive travel schedule for remaining countries

### Immigrant or refugee volume

### Tuberculosis burden

## Training activities to help remaining countries

### Webinars

### Panel physicians portal

### Atlanta training summit March 4-8, 2013

# Slide 67:

# Electronic Disease Notification (EDN)

## Regulatory responsibility for DGMQ to provide information to receiving health departments (HD) of arriving aliens with a notifiable condition

## An electronic system to fulfill this DGMQ regulatory responsibility

## Replaces paper-based Immigrant and Migrant Populations (IMP) system

## Provide HD access to recorded DS Form information and all scanned overseas DS Forms

## Provide HD with an electronic system to record and evaluate outcome of domestic follow up evaluations

# Slide 68:

# Pictorial diagram of the EDN system.

Begins with a globe labeled as overseas. Beneath the globe is a photo of a stethoscope labeled as overseas screening and a form labeled as overseas forms. There is a vertical line to the right of these pictures which is labeled Quarantine Stations and EDN-IOM interface. Arrows going from the globe, stethoscopes and form reach over onto the right side of the slide. On the other side of the line is another globe with the United State map on it and a United State flag next to it. Below this globe is a collection of pictures including a computer monitor, keyboard, laptop computer, an envelope, the FedEx Express logo. These are labeled as Data Entry Center CDC HQ –Atlanta. Above is a title EDN-Data Entry. Next to these pictures is a picture of a building that says Health Dept. on it. It is labeled as Local/State Health Departments. Above the health department picture is a title, EDN-WEB. Between the data entry and health department pictures are 2 arrows going back and forth between the pictures.

**Slide 69:**

Civil Surgeon Technical Instructions

## Dr. Mary Naughton led effort to revise

### Input from Division of Tuberculosis Elimination (DTBE)

### Input from U.S. tuberculosis community

## Important changes

### Requirement for mycobacterial cultures

### Updated guidance regarding latent *Mycobacterium tuberculosis* infection (LTBI)

## Delays implementing from United States Customs and Immigration Services (USCIS) resolved

## New civil surgeon technical instructions become effective May 1, 2008

# Slide 70:

# Thank You

For more information please contact Centers for Disease Control and Prevention

1600 Clifton Road, NE, Atlanta GA 30333

Telephone: 1-800-CDC-INFO (232-4636)/TTY: 1-888-232-6348

Email: CDCinfo@cdc.gov

Web: www.cdc.gov

## National Center for Emerging and Zoonotic Infectious Diseases

## Division of Global Migration and Quarantine

**Slide 71:**

# Case Presentations

## Sundari Mase MD, MPH

## Team Lead for Medical Affairs Division of Tuberculosis EliminationCenters for Disease Control and Prevention November 28, 2012

# Slide 72:

# Case # 1

## 32 year old VM female; visa applicant. No prior history of TB

## No signs/symptoms of TB

# Slide 73:

Chest x-ray with right upper lobe disease and infiltrate in right lower lobe.

# Slide 74:

# Case # 1

## AFB smear and culture positive x 3 – 10/12, 10/13 and 10/14/11

## Referred to panel site hospital for TB treatment by DOT

## Started on standard four drug regimen 10/26/11

# Slide 75:

# Case # 1

## DST for 1st-line drugs showed resistance to INH and SM, susceptibility to Rifampin, Ethambutol and PZA

## INH stopped 12/14/11

## Persistent positive cultures x 5 months

# Slide 76:

# 1 - What would be your next step(s)?

## Repeat first-line DST

## Repeat first- and perform second-line DST

## 1& 2 and start expanded MDR regimen

## 1& 2 and perform PCR-based test looking for mutations conferring resistance

# Slide 77:

# 1 - What would be your next step(s)?

## Repeat first-line DST

## Repeat first- and perform second-line DST

## 1& 2 and start expanded MDR regimen

## 1& 2 and perform PCR-based test looking for mutations conferring resistance

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# Slide 78:

# Case # 1

## Hain Genotype MTBDR plus Assay performed and shows INH and RIF resistant mutations 1/31/12

## Repeat first-line DST shows resistance to INH and SM, susceptibility to Rifampin, Ethambutol and PZA

# Slide 79:

# Case # 1

## Question through panel site consultation system: what should be the clinical approach given discordant phenotypic and genotypic susceptibility results in a patient with treatment failure?

# Slide 80:

# 2- What would be your next step?

## Continue current regimen based on phenotypic results

## Add moxifloxacin to the first-line regimen

## Treat with an MDR TB regimen

# Slide 81:

# 2- What would be your next step?

## Continue current regimen based on phenotypic results

## Add moxifloxacin to the first-line regimen

## Treat with an MDR TB regimen

Font for third bullet text is red.

# Slide 82:

# Case # 1

## Even with phenotypic evidence of RIF sensitivity, genotypic evidence of resistance has compromised RIF in this case

## Obtain second-line DST

## Treat with MDR TB regimen (late generation FQ, kanamycin/amikacin, Eto, CS, PZA)

# Slide 83:

# Case # 1

## Molecular testing for fluoroquinolones and aminoglycosides

## May consider using rifampin but not counted as an integral part of regimen

## Monitor sputum monthly and screen for adverse reactions to second line agents

## Call back if needed

# Slide 84:

# Case # 2

## 31 year-old female US immigrant visa applicant diagnosed with smear negative, culture positive INH resistant pulmonary tuberculosis

# Slide 85:

Chest x-ray showing right lower lobe effusion.

**Slide 86:**

Case # 2

## Started on Rifampicin 450mg, Pyrazinamide 1250mg and Ethambutol 800mg once daily on November 2, 2011

## Nausea after 2 weeks, but did not report her symptoms until after 33 doses

## SGPT done was 35x the upper normal limit

# Slide 87:

# 3 - What would be your next step?

## Stop medications

## Continue medications and follow clinically for jaundice

## Consult expert

**Slide 88:**

# 3 - What would be your next step?

## Stop medications

## Continue medications and follow clinically for jaundice

## Consult expert

Font for first bullet text is red.

# Slide 89:

# Case # 2

## Medications stopped

## Once LFTs nml, Rifampicin 300mg, Pyrazinamide 750mg and Ethambutol 600mg once daily started

## SGPT after 2 weeks was elevated at 4.5x the upper normal limit

## What regimen should be used now?

# Slide 90:

# Case # 2

## Concerned about the 300 mg/day dose of rifampin

## With INH resistant disease we do not want to underdose the rifampin and risk the development of rifampin resistance as well.

# Slide 91:

# Case # 2

## Challenge her with rifampin 450 mg/day and EMB 15 mg/kg/day

## If LFTs remain normal, do not start PZA

## Add moxi 400 mg qd

## Repeat DST to ensure no further acquired resistance

# Slide 92:

# Case # 3

## 2 year old Chinese adoptee diagnosed with scrofula in Henan Province in mid-December 2009

## Hospitalized for TB treatment

## No evaluation for pulmonary TB

## US-adoptive parents arranged for panel site evaluation

# Slide 93:

# Case # 3

## January 4, 2010 TST 16 mm, lymphoid tuberculosis of left cervical lymph node

## CXR performed

## Gastric aspirates collected January 7-9, 2010

## Child returned to Henan Province and a hospital there to continue treatment for scrofula

# Slide 94:

Chest x-ray showing a possible left upper lobe infiltrate, some left lower lobe disease, and some calcified mediastinal nodes.

**Slide 95:**

Lateral view of the x-ray in slide 94 with similar findings.

# Slide 96:

# Case # 3

## All three gastric aspirates were smear-negative but culture-positive

## DST results demonstrated resistance to HREZS

## Performed twice to verify results

**Slide 97:**

# 4 - What would be your next step(s)?

## Stop first-line drugs

## Obtain second-line DSTs

## Start expanded MDR TB regimen

## Refer back to panel site

## 1, 2, 3 & 4

**Slide 98:**

# 4 - What would be your next step(s)?

## Stop first-line drugs

## Obtain second-line DSTs

## Start expanded MDR TB regimen

## Refer back to panel site

## 1, 2, 3 & 4

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**Slide 99:**

# Case # 3

## Completed the initiation phase of TB treatment at the hospital in Henan Province in mid-February

## Re-evaluated at panel site 2/25/10

### Weight 9.5 kg

### Two red, swollen left supraclavicular lymph nodes 3cm×9cm and 2cm×1cm

### Asymptomatic per adoptive family

## CXR obtained 2/25/10

**Slide 100:**

Chest x-ray showing left lobe disease and abnormalities.

**Slide 101:**

Lateral view of the chest x-ray shown in slide 100 with same findings.

**Slide 102:**

# Case # 3

## Second-line DST ordered

## Placed on:

### Amikacin 15mg/kg/d,

### Levofloxacin 10mg/kg/d

### Para-Aminosalicylate 200mg/kg/d

### Prothionamide 10mg/kg/d

### Linezolid 10mg/kg/q8h

**Slide 103:**

# Case #3

## Head CT and LP (4 WBC, 100% lymphs) normal

## Gastric aspirate smear on March 9, 2010 positive (4/100 field)

## Still asymptomatic

## Accepted by receiving U.S. county

**Slide 104:**

# 5 - Would you grant a waiver for immigration?

## Yes

## No

## Don’t know

**Slide 105:**

# 5 - Would you grant a waiver for immigration?

## Yes

## No

## Don’t know

# Font for first bullet text is red

# Slide 106:

# Case # 3

## Patient was granted class A waiver and immigration to the U.S. was expedited

## The reason for granting the waiver was to ensure best treatment for the patient

## Questions?

**Slide 107:**

# Discussion Session

**Slide 108:**

## *Thank you for your participation!!*