Management of Tuberculosis Training for Health Facility Staff

A: Introduction
INTRODUCTION
Acknowledgements

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Introduction

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Introduction

What is tuberculosis?

Tuberculosis (TB) is a disease caused by an organism called *Mycobacterium tuberculosis*. These organisms are also known as tubercle bacilli. Usually they affect the lungs, in which case the disease is called pulmonary TB. Pulmonary TB is the most common type of TB worldwide. Symptoms of pulmonary TB include:

- cough,
- haemoptysis (spitting up blood),
- general symptoms such as weight loss, sweating, and tiredness,
- chest pain, and
- fever.

When a person with pulmonary TB coughs or sneezes, tubercle bacilli are spread into the air in tiny droplets. Other people can breathe in these droplets and become infected.

If TB affects organs other than the lungs (such as the lymph nodes, bones and joints, genitourinary tract, meninges, pleura, or intestines), it is called extrapulmonary TB. Patients with extrapulmonary TB are usually not infectious.

Importance of TB as a public health problem

The World Health Organization (WHO) declared TB a global emergency in recognition of the growing importance of TB as a public health problem. About one-third of the world’s population is infected with *M. tuberculosis*. Worldwide in 2000, there were about 8.7 million new cases of TB disease with 1.9 million deaths. *M. tuberculosis* kills more people than any other single infectious disease agent. Deaths from TB account for 25% of all avoidable deaths in developing countries.

Some 95% of TB cases and 98% of TB deaths occur in developing countries. Of cases in developing countries, 75% are in the economically productive age group (15–50 years old).

Once infected with *M. tuberculosis*, a person stays infected for life and may develop symptoms of TB disease at any time. However, among infected persons without HIV infection, only 1 in 10 (10%) will develop TB disease; most (90%) will remain healthy. The most important trigger for TB disease is weakening of the immune system.

Patients with weakened immune systems, such as those with HIV infection, are at greater risk of developing TB. In the year 2000, one-third of HIV-infected persons worldwide (about 13 million people) were also infected with *M. tuberculosis*. Of people infected with both HIV and *M. tuberculosis*, 50% will become sick with TB during their lifetime; 10% will become sick per year. Thus, the prevalence of HIV in a community has an important effect on the incidence of TB.
Without treatment, 50% of patients with pulmonary TB will die within 5 years, and 25% will remain sick with chronic, infectious TB. Another 25% will spontaneously recover and be healthy (due to strong immune defenses) but could become sick again at any time.

In this course, the terms “TB patients” and “TB cases” refer to patients in whom TB disease has been diagnosed. Methods of diagnosis will be discussed in module B: Detect Cases of TB.

The DOTS strategy

DOTS is the brand name of the internationally recommended strategy for TB control in response to this global emergency. DOTS has five key components:

- **Sustained political commitment** to increase human and financial resources and make TB control a nationwide priority integral to the national health system;

- **Access to quality-assured TB sputum microscopy** for case detection among persons presenting with, or found through screening to have, symptoms of TB (most importantly, prolonged cough);

- **Standardized short-course chemotherapy** for all cases of TB under proper case management conditions, including direct observation of treatment;

- **Uninterrupted supply of quality-assured drugs**;

- **Recording and reporting system enabling outcome assessment** of all patients and assessment of overall programme performance.

This course will focus on those components of the DOTS strategy that are carried out at the health facility level.

One of the most important components of DOTS is direct observation of treatment, which means that a health worker must watch a patient take each dose. Direct observation is important:

- to ensure that patients take the correct treatment regularly;

- to notice rapidly when a patient misses a dose, find out why, and solve the problem; and

- to monitor any problems that the patient may have with the disease, treatment, or other symptoms.
Purpose of this training course

This course has been designed for health workers who are responsible for detecting and managing patients with TB. These health workers may include health assistants, medical assistants, nurses, clinical assistants, clinicians, or physicians. Some may be private practitioners. Health workers may be male or female.

Health workers may work at health centres, hospital outpatient departments, dispensaries, or health posts. Throughout this course, the term “health facility” is used to include all types of health services that deliver outpatient care.

In most health facilities, TB control is part of general health care delivery. TB patients are received along with other types of patients. Improving TB management is part of improving health care in general.

This course will teach the skills and knowledge that health workers specifically need to detect cases of pulmonary TB, manage drug therapy for TB patients, inform patients about TB, and monitor the success of TB case detection and treatment at health facility level. The course will not teach basic medical techniques familiar to health workers, such as how to give injections or sterilize needles and syringes.

The course will not teach medical procedures used by clinicians to diagnose TB, manage severe side-effects, treat TB patients who have defaulted, or treat patients with chronic or multidrug-resistant TB (MDR-TB). For information on these procedures, physicians and other clinicians should refer to WHO treatment guidelines and appropriate references.¹

It is expected that participants in this course will implement the procedures taught. In order to implement these procedures, health facilities will need:

- supplies for collecting sputum samples (containers, labels),
- access to microscopy for examining sputum samples for TB,
- adequate supplies of anti-TB drugs, and
- standard TB forms and registers.

TB treatment regimens vary from country to country. Health facilities should, of course, use the specific treatment regimens recommended in their national guidelines. The general principles and practices taught in the course are applicable anywhere.

¹ Examples of references include:


Course methods and materials

This course uses a variety of methods and instruction, including reading, written exercises, discussions, role plays, demonstrations, and observations in a real health facility. Practice, whether in written exercises or role plays, is considered a critical element of instruction.

The complete training course includes the following modules (booklets containing units of instruction). Depending on the structure of your course, you may have been given some or all of these modules:

A: Introduction *(includes a glossary with definitions of terms that may be unfamiliar)*  
B: Detect Cases of TB  
C: Treat TB Patients  
D: Inform Patients about TB  
E: Identify and Supervise Community TB Treatment Supporters  
F: Manage Drugs and Supplies for TB  
G: Ensure Continuation of TB Treatment  
H: Monitor TB Case Detection and Treatment

If your course will include a field exercise to observe TB management at a health facility, you should have the booklet:

I: Field Exercise – Observe TB Management

In addition, you should have:

J: Management of Tuberculosis – Reference Booklet

The Reference Booklet contains important forms, worksheets, and summaries of procedures taught in the course. You can use this booklet as an on-the-job resource.

The course is designed for small groups of participants who are led and assisted by “facilitators” as they work through the course modules. The facilitators are not lecturers as in a traditional classroom. Their role is to answer questions, provide individual feedback on exercises, lead discussions, structure role plays, etc. For the most part, participants work at their own pace through the modules, although in some activities, such as role plays and discussions, the small group works together.

The modules may be used in several different ways:

- All of the modules may be completed in sequence without interruption, for example, in a 5-day training session.
- One module at a time may be used in a series of short training sessions, for example, one module per week.
- Selected modules may be used in a training session to teach specific needed skills.
- Modules may be used to train staff on the job for specific activities.
- Motivated health workers may work through modules on their own to teach themselves.
- Modules may be used a reference for staff in general health facilities.
Learning objectives

Each module will provide information and examples and allow you to practise certain skills necessary for detecting and managing TB cases and monitoring progress. Exercises are provided at the end of each module. The skills and information presented in each module are as follows:

**B: Detect Cases of TB**

- Procedures for detecting TB suspects
- How to use a *Register of TB Suspects*
- How to collect sputum samples
- How to use laboratory sputum results to identify TB cases
- Steps to inform TB suspects of results and begin additional care as needed
- How to check household contacts of TB cases

**C: Treat TB Patients**

- How to choose the appropriate treatment category
- How to determine where a patient will receive directly observed treatment
- How to prepare a patient’s *TB Treatment Card*, including specifying the treatment regimen and dose
- How and when to provide preventive therapy for household contacts of the TB patient
- How to give directly observed treatment and record it on the *TB Treatment Card*
- How to recognize side-effects and what to do
- How to determine when a patient is due for follow-up sputum examination
- How to decide, based on sputum results, the appropriate action needed
- How to determine treatment outcome

**D: Inform Patients about TB**

- Communications skills useful for informing patients
- How to inform the TB patient and family about TB and directly observed treatment (first meeting)
- Messages for the TB patient and family about TB and directly observed treatment
- How to continue informing the patient throughout treatment (subsequent meetings)
- Continuing messages for the TB patient about the treatment regimen (including the drugs, treatment schedule, side-effects, sputum examinations)
- Messages about HIV and TB, and pregnancy and HIV testing

**E: Identify and Supervise Community TB Treatment Supporters**

- How to help the patient identify a community TB treatment supporter who is likely to be effective
- How to train and supply a community TB treatment supporter with drugs
- How to resupply the community TB treatment supporter with drugs and review the patient’s *TB Treatment Card* on a monthly basis
- Steps to take if the community TB treatment supporter does not collect the next month’s drugs
F: Manage Drugs and Supplies for TB

- How to ensure sufficient stock of drugs for TB patients
- How to plan for other needed supplies (such as sputum containers, syringes and needles, forms)
- Good drug management procedures for safekeeping the supply of anti-TB drugs

G: Ensure Continuation of TB Treatment

- How to coordinate medical referrals and ensure that the TB patient continues treatment
- How to coordinate transfer of a TB patient who is moving to another area
- How to arrange for TB patients to continue treatment when travelling
- How to conduct a home visit to a patient who misses a dose or fails to collect drugs for self-administration
- How to trace a patient who interrupts treatment
- How to plan so that health facility staff are able to conduct home visits and trace patients

H: Monitor TB Case Detection and Treatment

- Key indicators related to TB case detection and data needed to monitor these
- How to compile data on TB case detection at the health facility
- Key indicators related to TB treatment and data needed to monitor these
- How to compile data on TB treatment at the health facility
- How to calculate indicators
- How to analyse indicators
- How to plan appropriate actions to solve problems
Glossary

The definitions provided here refer to the use of terms in the content of this course and are not necessarily valid in other contexts.

accountable ......................responsible for taking direction from somebody, performing a task or activity, and reporting back. Community TB treatment supporters must be accountable to the health facility staff.

acid-fast bacilli
(AFB) ..........................bacilli that hold stain colour even after washing with acid. Tubercle bacilli are acid-fast bacilli.

adherence ...........................following a rule or procedure as directed. For example, for a TB patient, adherence means taking anti-TB drugs as scheduled. See also compliance.

anorexia ..............................loss of appetite.

bacilli ..........................rod-shaped bacteria.

bacillary load ..........................quantity of bacilli present (may reach over 100 million in a single cavity of the lung).

BCG ................................bacille Calmette-Guérin, vaccine against tuberculosis that reduces risk of disease by 50–80% when given before infection.

blister pack ..........................a special package in which capsules and pills are sealed between a plastic layer and a paper or foil layer. Usually pills/capsules for a certain time period (such as a day or a week) are sealed together in one package with directions for taking them printed on the paper or foil back. The pills/capsules can be pushed out of the package one at a time, as needed.

case of tuberculosis ..........a patient in whom tuberculosis has been bacteriologically confirmed or diagnosed by a clinician.

checking question ..........................a question asked after giving instruction, intended to check the learner’s understanding, so that more information can be given if needed.

chronic case ..........................a patient who is sputum-positive at the end of a re-treatment regimen.

compliance ..........................following a rule or procedure as directed. For example, for a TB patient, compliance means taking anti-TB drugs as scheduled.

comply ..........................to follow a rule or procedure as directed, for example, to take medicine as directed.
continuation phase ..........the phase of TB treatment after the initial phase. The continuation phase usually lasts 4–6 months, during which the TB patient takes fewer drugs either daily or intermittently. The continuation-phase regimen is intended to eliminate remaining tubercle bacilli and prevent relapse.

contact ..................................see household contact.

convert ..................................to change from sputum smear-positive to sputum smear-negative.

conversion ..................................changing from sputum smear-positive to sputum smear-negative. Sputum conversion is the best indicator that initial-phase TB treatment has been effective.

conversion rate ......................the proportion of new sputum smear-positive cases that are shown to be sputum smear-negative after 2 or 3 months of treatment.

culture ..................................a method of diagnosis involving growing bacteria in a special medium conducive to their growth.

cure (treatment outcome) ........a sputum smear-positive patient who is sputum smear-negative in the last month of treatment and on at least one previous occasion.

default ..................................to interrupt (or interruption of) TB treatment for 2 consecutive months or more.

default (treatment outcome) ........a patient whose treatment was interrupted treatment for 2 consecutive months or more.

definite case of tuberculous disease ...............a patient with culture positive for the Mycobacterium tuberculosis complex. In countries where culture is not routinely available, a patient with two sputum smears positive for acid-fast bacilli (AFB) is also considered a definite case.

denominator .........................in a fraction, the number below the line.

diagnostic sputum smear examination ...............sputum smear examination done by microscope to diagnose pulmonary TB.

died (treatment outcome) ...............a patient who dies for any reason during the course of treatment.
directly observed treatment............................treatment observed by a health worker or a community TB treatment supporter. The health worker or community TB treatment supporter actually watches the TB patient swallow the drugs.

DOTS.............................................the internationally recommended control strategy for TB.

drug box.................................box that contains all the anti-TB drugs for a full treatment regimen for one patient.

drug resistance .....................adaptation of microorganisms so that they are not killed by a drug.

expired...........................................(in reference to a drug) past the date at which safety and effectiveness of the drug may become reduced. Expired drugs may be unsafe or ineffective and should be destroyed or returned to the district level store, or higher levels as appropriate.

expiry date .........................the date on which a drug expires, or becomes possibly less safe and effective.

extrapulmonary TB ........TB affecting organs other than the lungs, for example, lymph nodes, bones and joints, genitourinary tract, meninges, pleura, or intestines.

fixed-dose combination (FDC)...............................................two or more drugs combined in one pill or capsule, in specific dosages, to facilitate correct drug intake.

follow-up sputum smear examination ................sputum smear examination done by microscope to assess progress of TB treatment or prove cure (also called “control sputum smear examination”).

genitourinary tract........genital and urinary organs.

haemoptysis ......................spitting up blood.

heredity .........................genetic transmission of a quality or trait from parent to child.

household contact ..............someone who lives in the same dwelling with the TB patient (sleeps and eats at least one meal there per day).

incidence ...............................the number of new cases of a disease occurring in a defined population during a given time period.

indicator ...............................a measurable number, proportion, percentage, or rate that suggests, or indicates, the extent of a programme’s achievement or the level of some condition among the population.
**initial phase**
the first phase of TB treatment, usually lasting 2–3 months, during which the TB patient takes an intensive drug regimen (4–5 drugs daily). During this phase, sputum conversion usually occurs and clinical symptoms improve.

**intermittently**
as used in this course, 3 times per week. When treatment is taken intermittently, WHO recommends 3 times a week. Some countries use 2 times a week.

**jaundice**
yellow skin or eyes caused by damage or failure of the liver.

**MDR-TB**
multidrug-resistant TB. Active tuberculosis with bacilli resistant to at least rifampicin and isoniazid.

**meninges**
the membranes that envelope the brain and spinal cord.

**microscopy**
examination by means of a microscope.

**monitor**
to watch closely or check on a routine basis.

**mucopurulent**
containing both mucus and pus.

**Mycobacterium tuberculosis**
tubercle bacillus, that is, the bacillus that causes tuberculosis.

**nausea**
stomach upset, a feeling that one is about to vomit.

**new (type of patient)**
a patient who has never had treatment for TB or who has taken antituberculosis drugs for less than 1 month.

**numerator**
in a fraction, the number above the line.

**open-ended question**
a question that cannot simply be answered “yes” or “no” but requires further response. Questions that begin with “why,” “how,” etc. are open-ended.

**percentage**
a part of a whole expressed in hundredths. If 50% of a population is female, it means that 50 out of 100 people are female. The following examples show different ways of expressing the same meaning: 50% = 0.50 = 50/100; 4% = 0.04 = 4/100.

**pleura**
the membrane covering the lung and the wall of the chest cavity containing the lungs.

**prevalence**
the number of all cases of a disease existing in a defined population at a specific point in time or during a given time period.

**prognosis**
the predicted course that a disease will take; expectations for recovery or decline.
**proportion**.............................the relationship of a part to a whole, often written as a decimal fraction or percentage (for example, 0.17 or 17%).

**pulmonary TB**.............................tuberculosis affecting the lungs.

**pulmonary tuberculosis–sputum smear-positive** (PTB+).............................1. two or more initial sputum smear examinations positive for acid-fast bacilli (AFB), or
   2. one sputum smear examination positive for AFB plus radiographic abnormalities consistent with active pulmonary tuberculosis as determined by a clinician, or
   3. one sputum smear examination positive for AFB plus sputum culture positive for *Mycobacterium tuberculosis*.

**pulmonary tuberculosis–sputum smear-negative** (PTB–).............................a case of tuberculosis that does not meet the above definition for smear-positive tuberculosis.

**radiographic abnormalities**........................abnormalities that appear in X-rays.

**rate**.................................a measure of the frequency of some event in a defined population during a given time period, expressed, for example, as 1.5 per 100 000. Rates may also be expressed as decimal fractions (for example, 0.25) or as percentages (for example, 25%).

**referral**..............................sending a patient to another health facility or to a clinician. Patients may be referred for diagnosis, initiation of treatment, or special care/hospitalization for complications, toxicity, etc.

**regimen**..............................a plan of treatment specifying which drugs are to be given and the dose, frequency, and duration of treatment with each drug.

**relapse (type of patient)**........a patient previously treated for TB who has been declared cured or treatment completed, and is diagnosed with bacteriologically positive (smear or culture) tuberculosis.

**reserve stock**.........................extra stock kept by the health facility to ensure adequate supplies even if there is increased use or a delay in drug delivery.

**scanty**.................................result of examination of a sputum sample when fewer than 10 acid-fast bacilli are observed.

**side-effect**............................a secondary and usually adverse effect of a treatment or drug.

**specimen**..............................sample, a small amount (e.g. urine, sputum) to be tested.

**sputum**.................................matter ejected from the lungs through the mouth.
sputum smear microscopy …………………… examination of sputum with a microscope to determine whether acid-fast bacilli are present.

sputum smear-negative cases …………………… pulmonary TB patients whose sputum does not contain enough tubercle bacilli to be detectable by microscopy.

sputum smear-positive cases …………………… pulmonary TB patients whose sputum contains tubercle bacilli that are detectable by microscopy.

stock card ……………………………… a card kept with each drug and drug strength in the storeroom. The stock card is updated whenever drugs are received or dispensed, so that it always shows the actual balance in stock.

TB suspect ……………………………… any person who presents with symptoms or signs suggestive of tuberculosis, in particular, cough of long duration (2 weeks or more).

transfer ……………………………… as used in this course, changing a TB patient’s treatment facility when that patient moves.

transfer in (type of patient) ……………… a patient who has been transferred from another TB register to continue treatment.

transfer out (treatment outcome) ………… a patient who has been transferred to another recording and reporting unit and for whom the treatment outcome is not known.

treatment after default (type of patient) ………… a patient who returns to treatment, positive bacteriologically, following interruption of treatment for 2 months or more.

treatment after failure (type of patient) ………… a patient who is started on a re-treatment regimen after having failed previous treatment.

treatment completed (treatment outcome) ………… a patient who has completed treatment but who does not meet the criteria to be classified as a cure or a failure.

treatment failure (treatment outcome) ………… a patient who is sputum smear-positive at 5 months or later during treatment. Also an initially sputum smear-negative patient who becomes sputum smear-positive at 2 months.

treatment success …………………… an indicator calculated by adding the number or proportion of patients cured to those who completed treatment.
treatment supporter ..........a trained and supervised community member who directly observes a TB patient’s treatment. When it is not convenient for a patient to visit the health facility during regular hours, a community TB treatment supporter may be selected to directly observe a patient’s treatment at a more convenient place and time.

tuberculin test ................intradermal injection of 0.1 ml of tuberculin (protein extracted from TB bacilli). The test indicates TB infection but not disease. In an individual infected with TB, a hardening of the skin can be observed at the injection site in 48–72 hours.

tuberculosis (TB) ...............a disease caused by the organism Mycobacterium tuberculosis. Not everyone infected with M. tuberculosis develops symptoms of TB disease, which may include cough, haemoptysis, chest pain, weight loss, and tiredness (in pulmonary TB). In this course, TB refers to TB disease rather than the infection without disease.

tubercle bacilli .................bacilli that cause tuberculosis (Mycobacterium tuberculosis).
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