**Participant Workbook for the Online Childhood TB Training for Healthcare Workers Course**

.



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# Abbreviations

ART anti-retroviral therapy

CPT cotrimoxazole preventive therapy

CXR chest radiograph

DOT directly observed therapy

EPTB extra-pulmonary tuberculosis

FDC fixed-dose combination

HCW healthcare worker

HIV human immunodeficiency virus

IPT isoniazid preventive therapy

MDR-TB multi-drug resistant tuberculosis

NTP national tuberculosis program

PTB pulmonary tuberculosis

TB tuberculosis

TBM tuberculosis meningitis

TST tuberculin skin test

WHO World Health Organization

# Childhood TB for Healthcare Workers: An Online Course

The Union and the World Health Organization have developed a number of clinical aides and training tools to support and train healthcare workers at the primary and secondary care levels. This includes The Union’s **Desk-guide for the Diagnosis and Management of TB in Children** and the **Childhood TB for Healthcare Workers: An Online Course** that are freely available in different languages on the Union’s childhood TB learning portal - [**https://childhoodtb.theunion.org**](https://childhoodtb.theunion.org). These aim to equip the healthcare worker with the following competencies:

1. To understand the main features of the epidemiology of TB in children, including risk factors for infection and disease.
2. To develop the clinical skills to detect and diagnose TB in children in a resource-limited setting. This includes an understanding of which children might require referral to the next level of care while at the same time recognising the importance of outpatient assessment and follow-up in the diagnostic approach, as most children with TB do not require inpatient management.
3. To have knowledge of the national guidelines for the recommended regimens and dosages for the treatment of TB and for preventive therapy in children.
4. To recognise the importance of registering all children treated for TB with the NTP and to monitor treatment outcomes. To “know your epidemic” is a critical step in order to identify gaps, for procurement of diagnostics and TB drugs suitable for young children, for effective advocacy, and for investment and support to the health services.
5. To support the implementation of community-based contact screening and management.

**Online Course:**

Each section in this participant workbook corresponds to the 6 modules in the online course. Prior to starting the online course, please review the questions in this workbook. As you complete each module of the online course, complete and take notes in the corresponding section in this workbook.

## MCj02341340000[1]Module 1: Epidemiology

Questions:

1. Who reports TB cases in your programme?
2. Do you face any challenges with regards to reporting? If so, what are those challenges?
3. Do you have access to your programme data?
4. What percent of cases were in children in your setting last quarter?
5. Do you think your programme is over or underreporting cases?
6. Do you face any challenges in accessing accurate data about your programme’s TB cases? If so, what are those challenges?
7. What are some risk factors for exposure and infection in your setting?
8. What are some risk factors for disease in your setting (e.g. high rates of malnutrition)?
9. Note any questions that you have or areas which you do not understand related to the epidemiology of childhood TB in your setting:

## Module 2: Diagnosis MCj02341340000[1]

Questions

1. Who usually diagnoses TB in children in your setting? Who starts treatment and who follows up children with TB?
2. What are the referral pathways in your setting for children with a suspected TB diagnosis?
3. What diagnostic tests are available in your setting (e.g., chest radiograph, tuberculin skin test, sputum testing)?
4. Considering your setting and what you have learned from the course so far, what barriers can you identify that makes the diagnosis of TB in children difficult?
5. Last quarter, what percent of total cases of TB in children were pulmonary? Extra-pulmonary?
6. Note any questions that you have or areas which you do not understand related to the diagnosis of TB in children:

## Module 3: Treatment MCj02341340000[1]

Questions

1. How do your treatment guidelines compare to current WHO guidelines?
2. What fixed-dose combinations are available in your programme?
3. Who administers and supervises treatment in your programme?
4. Who completes the TB register? Who reports cases to the national TB programme?
5. What are some strategies you use to improve medication adherence?
6. Does your programme offer directly observed therapy?
7. Note any questions that you have or areas which you do not understand related to treatment of TB in children:

## Module 4: TB/HIV MCj02341340000[1]

Questions

1. What is the prevalence of HIV in your setting?
2. Does your programme offer HIV services?
3. If you diagnose TB and HIV at the same time, when do you start treatment for HIV?
4. Last year, what percent of children with TB had HIV in your programme?
5. Note any questions that you have or areas which you do not understand related to TB/HIV in children:

## Module 5: Prevention MCj02341340000[1]

Questions

1. What questions do you ask to ensure you identify all child contacts of TB cases?
2. Do you have any challenges when asking patients about TB contacts? What strategies do you use to identify contacts of TB cases?
3. Do you have a standardised recording and reporting system for isoniazid preventive therapy (IPT)?
4. Do you have any challenges with IPT? If so, what are those challenges?
5. What strategies do you use to increase adherence to IPT?
6. What are some feasible methods you can implement to prevent the spread of infection in your clinical setting?
7. Note any questions that you have or areas which you do not understand related to prevention of TB in children:

## Module 6: Practice MCj02341340000[1]

Questions

1. Note any questions that you have or areas which you do not understand in this online course:

# Facilitated Course

Use this section as a guide during the facilitated course. The general format for each section is as follows:

|  |  |
| --- | --- |
|  | **Learning Objectives/Expected Outcomes for Module** |
| http://eswt.net/wp-content/uploads/2011/06/roundtable.gif | **Discuss Setting-Specific Practices** |
| http://2.bp.blogspot.com/-gygvlpX4n-4/UVE5nVG-8rI/AAAAAAAACGw/-1Y7oc4Bg6Y/s1600/Question_mark.pnghttp://eswt.net/wp-content/uploads/2011/06/roundtable.gif | **Practice Cases/Exercises and Discussion Questions**  How do the cases from the module differ from cases seen in your setting? How are they similar?  Are there challenges faced in your setting that are not addressed in the cases? |
| http://funtech2000.files.wordpress.com/2012/09/communication.jpg | **Role-Play**  Role-play scenarios to “practice” important skills learned in the module |
|  | **Summary of Key Learning Points** |

## Module 1: Epidemiology

|  |  |
| --- | --- |
| **Learning objectives** | At the end of this module, participants will be able to:   * Identify and describe risk factors for TB exposure, infection, and disease * Identify populations at increased risk of TB infection and disease * Describe the epidemiology of paediatric TB in their setting * Describe the importance of reporting all TB cases * Accurately complete a TB register based on local case and outcome definitions and analyse data from a quarterly TB report   In this module, we have discussed the three epidemiological stages of TB – exposure, infection and disease, as well as specific risk factors that increase were also some discussions around routine data and how to apply certain concepts to better understand childhood TB epidemiology in your own setting. Lastly, we looked at global TB epidemiology, and factors that are associated with TB incidence. |

|  |  |
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| **Discuss setting-specific practices**  http://eswt.net/wp-content/uploads/2011/06/roundtable.gif | * Who is responsible for recording and reporting in your setting? |
| * Are there any challenges faced with regards to reporting? |
| * Do you have access to your data? At which level do you have access: primary healthcare facility, secondary healthcare facility, or the district level? |
|  | * Have a look at setting specific tools for TB: patient treatment cards, TB registers, and quarterly reports. Do they take age into account, enabling age disaggregated reporting? |
|  | * At what unit/level does reporting occur in your country: only at primary care level, at secondary or tertiary level? Do hospitals function as reporting units? And if not, what systems are relied upon to capture data from patients who are diagnosed in the hospital? |
|  | * Are patients with drug susceptible TB and drug-resistant TB captured in the same way? Or, are there different reporting mechanisms? |

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| **Practice Cases/Exercises and Discussion Questions**  **http://2.bp.blogspot.com/-gygvlpX4n-4/UVE5nVG-8rI/AAAAAAAACGw/-1Y7oc4Bg6Y/s1600/Question_mark.png** | |
| **Questions** | |
| Compare risk factors for TB exposure, infection, and disease | |
| 1. Explain how TB is transmitted to children |  |
| 2. Can you describe the community risk factors that affect a child’s risk of TB exposure and/or infection? |  |
| 3. Can you describe the factors relating to a TB exposure episode that affect a child’s risk of TB infection? Also discuss in which direction the factor will influence the risk of infection. |  |
| 4. Can you list the factors that will increase a child’s risk of disease progression following TB infection or exposure? |  |
| 5. What types of TB in children would be recognised as severe forms of TB disease? |  |
| 6. What factors can increase the risk of a child to develop severe  forms of TB disease? |  |
| 7. Can adults with extra-pulmonary TB transmit the disease to others? And do we need to screen their close contacts or start them on preventive therapy if they are eligible? |  |
| 8. Discuss different types of TB and how this affects the infectiousness of the source case. Also discuss the importance of screening other household members for TB, to identify any patient with undiagnosed TB |  |
| Data Interpretation | |
| 1. What are the three indicators that are useful for evaluating childhood TB data in any setting? |  |
| 2. In a high burden TB setting, what do you expect these to be? |  |
| 3. If you find unusual or unexpected findings in the reports, what factors should you consider? |  |
| Evaluation of setting specific routine data – if possible, evaluate most recent available quarterly reports from your setting for this activity.\*\*  \*\* If you are unable to find any setting specific routine data, you can either access your local data from the WHO website at the following web link (http://who.int/tb/country/data/download/en/) or use the following fictitious quarterly reports to answer the questions below. Keep your calculator at hand as you might need to use it for the calculations. | |
| 1. What percent of cases were in children in your setting in the previous quarter? |  |
| 2. Does the age ratio between 0-4 and 5-14 years old look acceptable? Why or why not? |  |
| 3. What proportion of children in each age category had extra-pulmonary TB? |  |
| 4. Do you think your data are accurately reflecting your burden of childhood TB? Or are you possible over or underreporting cases? |  |
| 5. Is the uptake of HIV testing acceptable? |  |

Fictitious Quarterly Reports

**Period 1: District health centre in Africa (high incidence of HIV)**

**Quarterly report for quarter 3, 2014.**



**Step 1**: Calculate the indicators in the table below from the data in the above report for Quarter 3, 2014.

|  |  |
| --- | --- |
| **Questions** | **Quarter 3 (2014)** |
| 1. Total adult TB case load |  |
| 2. Total number of children (0-14) |  |
| 3. Percentage child TB cases of total cases |  |
| 4. Proportion/ratio of children 0-4 vs. 5-15 |  |
| 5. Percentage of EPTB cases amongst children |  |
| 6. Uptake of HIV testing among TB cases |  |

**Step 2**: Answer the following questions interpreting the indicators you have calculated in the above table:

|  |  |
| --- | --- |
| **Questions** | |
| 1. Was the percentage of child TB cases in this centre acceptable? |  |
| 2. Does the ratio between 0-4 and 5-14 years old look acceptable? |  |
| 3. What proportion of children in each age category |  |
| 4. Do you think the data is accurately reflecting the burden of childhood TB in this district? |  |
| 5. Is the uptake of HIV testing acceptable? |  |

**Period 2: Same district health centre in Africa (high incidence of HIV)**

**Quarterly report for quarter 3, 2015.**



**Step 3**: Calculate the indicators in the table below from the data in the above report for Quarter 3, 2015.

|  |  |
| --- | --- |
| **Questions** | **Quarter 3 (2015)** |
| 1. Total adult TB case load |  |
| 2. Total number of children (0-14) |  |
| 3. Percentage child TB cases of total cases |  |
| 4. Proportion/ratio of children 0-4 vs. 5-15 |  |
| 5. Percentage of EPTB cases amongst children |  |
| 6. Uptake of HIV testing among TB cases |  |

**Step 4**: Answer the following questions interpreting the indicators you have calculated in the above table:

|  |  |
| --- | --- |
| **Questions** | |
| 1. Was the percentage of child TB cases in this centre acceptable? |  |
| 2. Does the ratio between 0-4 and 5-14 years old look acceptable? |  |
| 3. What proportion of children in each age category |  |
| 4. Do you think the data is accurately reflecting the burden of childhood TB in this district? |  |
| 5. Is the uptake of HIV testing acceptable? |  |

**Step 5**: Further questions for discussion

|  |  |
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| **Questions** | |
| 1. What do you need to consider when comparing the two time periods? |  |
| 2. Are there challenges faced in your setting that are not addressed in the cases? |  |

## Module 2: Diagnosis

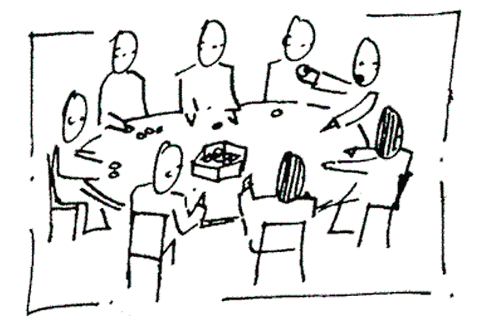
**Summary of Key Learning Points**

* TB is caused by *Mycobacterium tuberculosis*
* TB can be categorized into three stages: exposure, infection, and disease
* Not everyone who is exposed will become infected, and not everyone who becomes infected will develop disease
* Risk factors for exposure and infection include crowded living conditions, sharing a bed, living in a TB endemic area, poor ventilation, and regular contact with a source case with sputum smear positive pulmonary TB
* Risk factors for disease include recent exposure to TB, young age, and immunocompromising conditions including HIV infection, and malnutrition
* TB in children is an important contributor to the overall burden of TB and it impacts child health and survival
* Children account for approximately 10% of the burden of disease, but there is often under diagnosis and under reporting of childhood TB cases
* It is very important to report all cases of TB to the national TB programme
* Extrapulmonary TB is generally not transmissable to others

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| **Learning objectives** | At the end of this module, participants will be able to:   * Take a thorough history to identify risk factors for TB * Identify key components of the physical exam when evaluating a child for TB * Identify children who need to be referred for further evaluation * Use diagnostic tests as indicated to diagnose TB |

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| **Discuss setting-specific practices**  http://eswt.net/wp-content/uploads/2011/06/roundtable.gif | * Who usually diagnoses TB in children? Who starts treatment and who follows up children with TB? Have a discussion of what resources are available in your setting to diagnose and identify children with TB. |
| * What are the referral pathways in your setting for children with suspected TB? |
| * Considering your setting and what you have learned from the course, what barriers can you identify that makes the diagnosis of TB in children difficult? What solutions can you think of to resolve some of these issues? |

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| **Practice Case 1: Mia’s Case: Unconfirmed TB** | | |
| **http://2.bp.blogspot.com/-gygvlpX4n-4/UVE5nVG-8rI/AAAAAAAACGw/-1Y7oc4Bg6Y/s1600/Question_mark.png** | Mia is a 3-year-old girl who presents with symptoms consistent with acute onset pneumonia. She had a cough and fever for one week. She did not have any weight loss, but she had a history of contact with someone with TB (although not recent). Clinically, she had a high temperature, was breathing quite fast, had slight sub-costal retractions, and had crackles in the left lung base; a typical picture of acute pneumonia. | |
| **Questions** | | |
| 1. How would you manage her treatment and why? | |  |
| 2. What would you do if she did not respond to antibiotics in 2 weeks’ time and why? | |  |
| **Discussion Questions** | | |
| 1. How does this case from the module differ from cases you see in your setting? How is it similar? | |  |
| 2. Are there challenges faced in your setting that are not addressed in the cases? | |  |



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| **Practice Case 2: Sudeep’s Case: TB Meningitis (TBM) and Missed Opportunities for Diagnosis** | | |
| **http://2.bp.blogspot.com/-gygvlpX4n-4/UVE5nVG-8rI/AAAAAAAACGw/-1Y7oc4Bg6Y/s1600/Question_mark.png** | Sudeep is an 8-month-old boy who presents severely ill with a decreased level of consciousness, fever, and a strong TB contact history. Clinically, he has a high temperature, weight loss, and signs of TB meningitis. | |
| **Questions** | | |
| 1. How would you manage Sudeep’s treatment and why? | |  |
| 2. In the case study we are not given more information regarding Sudeep’s management at the hospital level. We presume that the hospital started TBM treatment immediately. What other treatment guidelines are important for the hospital management of TBM in your setting? | |  |
| 3. As the case study unfolds in the course we learn that there was evidence of weight loss at a previous visit to the clinic in Sudeep’s case however there is no evidence that a HCW noticed this or acted upon this red-flag finding. What could be done in your setting to ensure that red-flag signs such as weight loss are investigated for TB? | |  |
| 4. Could TBM have been prevented in this case? | |  |
| 5. What are some risk factors for severe disease? | |  |
| **Discussion Questions**  http://eswt.net/wp-content/uploads/2011/06/roundtable.gif | | |
| 1. How does this case from the module differ from cases you see in your setting? How is it similar? | |  |
| 2. Are there challenges faced in your setting that are not addressed in the cases? | |  |

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| **Practice Case 3: Ojore’s Case- The Role of TST and Bacteriologic Sampling** | | |
| **http://2.bp.blogspot.com/-gygvlpX4n-4/UVE5nVG-8rI/AAAAAAAACGw/-1Y7oc4Bg6Y/s1600/Question_mark.png** | Ojore is a 10-year-old boy who presents with the typical signs and symptoms of PTB that are usually seen in adults. His CXR shows cavities and he is able to give sputum for bacteriological testing that is Xpert MTB/RIF positive. | |
| **Questions** | | |
| 1. The TB contact history in this case is unclear and the clinic did not have TST available to help in the diagnosis. Would it have been helpful to have a TST result in this case? Why or why not? | |  |
| 2. Would you have collected a sputum specimen for Ojore? Why or why not? | |  |
| **Discussion Questions**  **http://eswt.net/wp-content/uploads/2011/06/roundtable.gif** | | |
| 1. How does this case from the module differ from cases you see in your setting? How is it similar? | |  |
| 2. Are there challenges faced in your setting that are not addressed in the cases? | |  |

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| **Role Play Scenarios**  http://funtech2000.files.wordpress.com/2012/09/communication.jpg | **Role Play 1: Unconfirmed TB in Young Children**  The patient is 2 years old, has a clinical picture of TB (weight loss, fever, and cough for 3 weeks), but there is no TB contact history. You were able to do a CXR that looked suggestive of TB but were not able to do a TST. The diagnosis is therefore “probable TB.” |
| Role of Healthcare Worker  http://www.flaticon.com/png/256/16746.png | * Counsel the caregiver of a patient that you want to start on TB treatment. |
| Role of Caregiver | * Ask the healthcare worker why treatment is necessary if the diagnosis is not confirmed. * Ask the healthcare worker to explain the risks and benefits of treatment. * Think about how the healthcare worker made you feel. Did you understand everything that was said to you? Did you have any unanswered questions? |
| Role of Observer | Evaluate and provide feedback on how the healthcare worker did the following:   * Established trust and rapport * Identified and addressed patient’s concerns * Exhibited confidence * Demonstrated professionalism * Used simple language and had clear explanations * Listened carefully * Exhibited non-judgmental behaviour |

**Summary of Key Learning Points**

* It is possible to make a clinical diagnosis of TB in children in the absence of diagnostic tests
* TST and CXRs can be helpful diagnostic tests, but they are not necessary to make a diagnosis
* The current bacteriologic tests are of limited value in children, and a negative test does not rule out TB. However, samples should be obtained for microbiological testing when possible
* Induced sputum or gastric aspiration/lavage are indicated and safe in younger children
* In older children, follow the adult algorithm for obtaining sputum and testing
* Xpert MTB/RIF can be a useful tool to confirm the diagnosis of TB and provide information about drug resistance

## Module 3: Treatment

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| **Learning objectives** | At the end of this module, participants will be able to:   * Identify treatment regimens for TB in children based on the severity of disease in the child, HIV prevalence in their setting, and isoniazid resistance in their setting * Identify methods to increase adherence to TB treatment * Communicate effectively with families the side effects of TB medications * Identify children who need to be referred for further evaluation |

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| **Discuss setting-specific practices**  http://eswt.net/wp-content/uploads/2011/06/roundtable.gif | * Review local treatment guidelines and compare to current WHO guidelines. |
| * Review local Fixed Dose Combination (FDC) formulations available for treatment |
| * Review local weight banded dosing charts if available |
| * Discuss roles and responsibilities of different HCW in the follow-up of patients (doctors, nurses, community healthcare workers, like DOTS workers - focus on who is responsible for doing and documenting all aspects of management) |
| * Discuss local practices of administering/supervising treatment– by caregiver, DOTS workers in the community, in clinic by pharmacy staff or nursing staff? |
| * Review local treatment cards and how to fill them in correctly |
| * Review local recording and reporting practices. Who is responsible? How is it monitored? |

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| **Practice Case 1: Weight-banded dosing of FDC formulations and follow-up.** | | |
| **http://2.bp.blogspot.com/-gygvlpX4n-4/UVE5nVG-8rI/AAAAAAAACGw/-1Y7oc4Bg6Y/s1600/Question_mark.png** | Chandni is a 2-year-old girl with PTB and weighs 13 kg. | |
| **Questions** | | |
| 1. What factors will you consider when choosing a regimen to start her on treatment? | |  |
| 2. How will you dose her with the available treatment options in your setting? | |  |
| 3. How will you plan to follow her treatment in your setting and how does it differ from the recommended follow-up in the course? | |  |
| 4. How will you know that she is responding to treatment? | |  |
| **Discussion Questions**  http://eswt.net/wp-content/uploads/2011/06/roundtable.gif | | |
| 5. How does this case from the module differ from cases you see in your setting? How is it similar? | |  |
| Are there challenges faced in your setting that are not addressed in the cases? | |  |

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| **Practice Case 2: Challenges with adherence and poor treatment response** | | |
| **http://2.bp.blogspot.com/-gygvlpX4n-4/UVE5nVG-8rI/AAAAAAAACGw/-1Y7oc4Bg6Y/s1600/Question_mark.png** | Ojore is 10-year-old boy and weighs 24 kg. He has severe adult type PTB with cavities, and has problems with taking his medicine and is vomiting. | |
| **Questions** | | |
| 1. Suppose Ojore was adherent to his treatment but still did not improve clinically – how will you evaluate and manage this in your setting? | |  |
| 2. Ojore is Xpert MTB/RIF positive. Will you repeat bacteriological specimen testing during follow-up to monitor treatment response? | |  |
| 3. What do your local or WHO guidelines say about this? | |  |
| **Discussion Questions**  http://eswt.net/wp-content/uploads/2011/06/roundtable.gif | | |
| 1. How does this case from the module differ from cases you see in your setting? How is it similar? | |  |
| 2. Are there challenges faced in your setting that are not addressed in the cases? | |  |

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| **Role Play Scenarios**  http://funtech2000.files.wordpress.com/2012/09/communication.jpg | **Role Play 1: Starting Treatment** |
| Role of Healthcare Worker  http://www.flaticon.com/png/256/16746.png | * Counsel the caregiver of a patient that you want to start on TB treatment. * Explain how to prepare and administer the medications to a small child, explain what to do if the child vomits after the dose, discuss adverse effects, and explain when the caregiver should bring the child in for evaluation. * Bring FDC formulations, if feasible, and give practical advice on how to give medications and when to repeat dosages if the child vomits. |
| Role of Caregiver | * Think about how the healthcare worker made you feel. * Did you understand everything that was said to you? * Did you have any unanswered questions? |
| Role of Observer | Evaluate and provide feedback on how the healthcare worker did the following:   * Established trust and rapport * Identified and addressed patient’s concerns * Exhibited confidence * Demonstrated professionalism * Used simple language and had clear explanations * Listened carefully * Exhibited non-judgmental behaviour |

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| http://funtech2000.files.wordpress.com/2012/09/communication.jpg**Role Play Scenarios** | **Role Play 2: Adherence Counselling** |
| Role of Healthcare Worker  http://www.flaticon.com/png/256/16746.png | * Counsel an adolescent who refuses to take medication |
| Role of Adolescent | * Refuse to take medication because there are too many pills to take and you do not want to waste your time. You also do not like the idea of a healthcare worker watching take your medications. |
| Role of Observer | Evaluate and provide feedback on how the healthcare worker did the following:   * Established trust and rapport * Identified and addressed patient’s concerns * Exhibited confidence * Demonstrated professionalism * Used simple language and had clear explanations * Listened carefully * Exhibited non-judgmental behaviour |

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| **Role Play Scenarios**  http://funtech2000.files.wordpress.com/2012/09/communication.jpg | **Role Play 3: Adherence Counselling** |
| Role of Healthcare Worker  http://www.flaticon.com/png/256/16746.png | * Counsel a caregiver struggling to give medicines to a young child |
| Role of Caregiver | * You are concerned about the medications, how to give them easily, and the side effects. |
| Role of Observer | Evaluate and provide feedback on how the healthcare worker did the following:   * Established trust and rapport * Identified and addressed patient’s concerns * Exhibited confidence * Demonstrated professionalism * Used simple language and had clear explanations * Listened carefully * Exhibited non-judgmental behaviour |

**Summary of Key Learning Points:**

* Drug dosages are calculated as mg/kg. Children weighing above 25 kg can be treated with adult dosages and formulations
* Once you decide to start TB treatment in a child, it should be continued for the full 6 (or 12) months
* It is important to check the child’s weight at each follow-up visit and adjust the drug dosages accordingly
* Make the child and their parents/caregiver your partner in the management of the child. They have to understand the importance of treatment and feel comfortable to ask you any questions or raise any concerns they have
* Make sure to ask about side effects as well as adherence at each follow-up visit, and counsel the child/parent/caregiver at each follow-up visit
* Monitor for signs of treatment response. Any sign of treatment failure should prompt referral for more specialty care
* If you suspect drug-resistant TB, refer the child to the appropriate treatment facility
* All forms of extrapulmonary TB (EPTB) should be treated with 4 drugs during the intensive phase, except for peripheral lymph node TB, which can be treated with three drugs
* In addition to TB meningitis, TB of the joints and bones should also be treated for a total of 12 months
* All other forms of EPTB are treated for 6 months

## Module 4: TB and HIV

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| **Learning objectives** | At the end of this module, participants will be able to:   * Diagnose, treat, and manage TB in a child with HIV * Identify appropriate referral pathways for care in children with HIV * Recognize IRIS and refer children for further care as indicated |

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| **Discuss setting-specific practices**  http://eswt.net/wp-content/uploads/2011/06/roundtable.gif | * Are TB and HIV services integrated in your setting? To what extent are the services integrated? Please provide examples of integration. (Possibilities - same healthcare workers providing both services to services provided at different levels of care, i.e., HIV at hospital level and TB at primary care level) |
| * What is done in your setting if you diagnose HIV and TB at the same time in a child? When do you start HIV treatment? |
| * Briefly discuss paediatric HIV guidelines in your setting – what do the guidelines say about TB? Do the guidelines differ from what you learned in the course? From WHO guidelines? |
| * Briefly discuss the prevention of mother-to-child transmission of HIV (PMTCT) guidelines in your setting and the follow up of babies born to HIV-infected women (breastfeeding practices, HIV screening time points, and TB screening of children). |
| * Briefly discuss TB screening for pregnant women (especially HIV-infected women) in your setting. What are the consequences of TB in pregnancy for the mother and baby? |
| * Discuss how your setting does TB screening for family members (especially children) of HIV-infected patients. |

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| **Practice Case 1: TB and HIV diagnosed at the same time** | | |
| **http://2.bp.blogspot.com/-gygvlpX4n-4/UVE5nVG-8rI/AAAAAAAACGw/-1Y7oc4Bg6Y/s1600/Question_mark.png** | Beko is a 4-year-old who was diagnosed with TB and HIV at the same time. Initially Beko responded well to treatment, but then started to deteriorate again | |
| **Questions** | | |
| 1. The WHO guidelines recommend that in cases where TB and HIV are diagnosed simultaneously, that TB treatment should be started first and the ARV treatment only after 2 weeks. Why is this recommended? | |  |
| 2. Would you do the same in your setting (i.e. not start TB treatment and ARV treatment together)? Also refer to the additional medications that were started – pyridoxine and cotrimoxazole preventive therapy. Do you do the same in your setting? | |  |
| 3. What anti-retroviral therapy (ART) regimens would be used in your setting and why? | |  |
| 4. How does the follow-up of HIV infected TB patients differ from HIV-uninfected TB patients? | |  |
| 5. Beko was treated for drug susceptible TB but did not improve – Discuss the different reasons for not responding to treatment. | |  |
| 6. How will you systematically go about confirming or ruling out these different diagnoses/reasons responsible for poor treatment response in a HIV infected TB patient, specifically focusing on referral and the role of special investigations | |  |
| 7. What is IRIS? | |  |
| 8. What are two kinds of IRIS? | |  |
| **Discussion Questions**  http://eswt.net/wp-content/uploads/2011/06/roundtable.gif | | |
| 1. How do the cases from the module differ from cases you see in your setting? How are they similar? | |  |
| 2. Are there challenges faced in your setting that are not addressed in the cases? | |  |

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| **Practice Case 2: Complicated HIV and disseminated TB** | | | |
| **http://2.bp.blogspot.com/-gygvlpX4n-4/UVE5nVG-8rI/AAAAAAAACGw/-1Y7oc4Bg6Y/s1600/Question_mark.png** | Imani is a two-year-old HIV-infected child already receiving ART that presents severely ill with possible miliary TB. | | |
| **Questions** | | | |
| 1. This case was referred for further investigation and management at a higher level of care. What do you think would happen at the referral hospital if the referral hospital were in your setting? | |  | |
| 2. Would there be an opportunity to refer this patient back to a primary care setting? How would this work in your area? | |  | |
| 3. Do you need to stop ARV treatment when starting TB treatment in a patient already known to have HIV infection and already on ARV treatment? Do we need to change the regimen? | |  | |
| 4. There were some indications that Imani may not have received adequate treatment for HIV potentially due to missed visits at the HIV clinic. (There may be poor adherence of ART for extended periods of time, or failure of the regimen). How would you explore and manage this in your setting? What other people should ideally be involved in her care? | |  | |
| 5. What multidisciplinary resources do you have in your setting? And how can you utilize other members of the team better to help with difficult cases such as this one? | |  | |
| **Discussion Questions**  http://eswt.net/wp-content/uploads/2011/06/roundtable.gif | | | |
| 1. How do the cases from the module differ from cases you see in your setting? How are they similar? | | |  |
| 2. Are there challenges faced in your setting that are not addressed in the cases? | | |  |

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| http://funtech2000.files.wordpress.com/2012/09/communication.jpg**Role Play Scenarios** | **Role Play 1: TB and HIV Diagnosed Simultaneously** |
| Role of Healthcare Worker  http://www.flaticon.com/png/256/16746.png | * Counsel a caregiver of a child who just had both TB and HIV diagnosed at the same time. Discuss pill burden, toxicity, IRIS and HIV and TB screening for the rest of the family. |
| Role of Caregiver | * Think about how the healthcare worker made you feel. * Did you understand everything that was said to you? * Did you have any unanswered questions? |
| Role of Observer | Evaluate and provide feedback on how the healthcare worker did the following:   * Established trust and rapport * Identified and addressed patient’s concerns * Exhibited confidence * Demonstrated professionalism * Used simple language and had clear explanations * Listened carefully * Exhibited non-judgmental behaviour |

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| **Role Play Scenarios**  http://funtech2000.files.wordpress.com/2012/09/communication.jpg | **Role Play 2: Repeat HIV PCR Testing in a Young Child** |
| Role of Healthcare Worker  http://www.flaticon.com/png/256/16746.png | * Counsel caregiver about doing a follow-up HIV PCR test on a young child with possible TB, who previously tested negative for HIV at birth. |
| Role of Caregiver | * Think about how the healthcare worker made you feel. * Did you understand everything that was said to you? * Did you have any unanswered questions? |
| Role of Observer | Evaluate and provide feedback on how the healthcare worker did the following:   * Established trust and rapport * Identified and addressed patient’s concerns * Exhibited confidence * Demonstrated professionalism * Used simple language and had clear explanations * Listened carefully * Exhibited non-judgmental behaviour |

**Summary of Key Learning Points:**

* If a child is diagnosed with both TB and HIV at the same time, TB treatment should be started immediately. HIV treatment should then be started approximately two weeks later
* All children with HIV and TB should start on cotrimoxazole preventive therapy
* It may be necessary to refer a child with HIV to a higher level of care if:
  1. There is diagnostic doubt about TB
  2. The child is very unwell
  3. The treatment regimen for either HIV or TB is complicated
  4. The child cannot tolerate treatment for HIV or TB
  5. The child is not responding to TB treatment
  6. There is any suspicion of drug-resistant TB or there is confirmed drug-resistant TB
  7. The child develops IRIS

## Module 5: Prevention

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| **Learning objectives** | At the end of this module, participants will be able to:   * Describe the methods used to prevent TB in children * List the potential adverse effects associated with BCG vaccination * Identify groups for which preventive therapy is recommended * Identify methods used to prevent the spread of TB |

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| **Discuss setting-specific practices for prevention**  http://eswt.net/wp-content/uploads/2011/06/roundtable.gif | * How are contacts of TB patients currently being identified in your setting – are you using an active or a passive contact tracing model? Are contacts identified at the household level, or only through questions to the TB case? And how do you currently ensure that all contacts are informed and screened for TB? |
| * Are there other preventive therapy regimens besides 6 months of IPT that are being used in your setting? |
| * Are there clear guidelines in your setting to explain roles and responsibilities related to tracing, screening and follow up of child TB contacts? |
| * What definition of a household contact is used in your setting? How common is it that multiple unrelated families might share a house or a plot? And if it is common, are questions asked to identify children outside of the immediate family of the TB case who might be in close contact with the case? |
| * Is BCG immunisation used as a strategy to prevent childhood TB in your setting? What is vaccine coverage? At what age is BCG usually given? |
| * If there is a high burden of adult MDR-TB cases in your setting, are there any guidelines on how to manage children exposed to MDR TB? |
|  | * How is contact management and preventive therapy documented in your setting? Do you have any structured tools in place to record preventive therapy delivery? How is this process monitored and reported? |

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| **Discuss setting-specific practices for infection control**  http://eswt.net/wp-content/uploads/2011/06/roundtable.gif | * Are basic infection control measures implemented in healthcare facilities in your setting and if so, what are they? What facilities or clinical settings are regarded as settings where children might have a high risk of exposure to TB? Discuss firstly how patients and their children are protected, and then how healthcare workers are protected. |
| * Which children with TB that require hospitalisation are at particular risk of transmitting TB to other children in the hospital ward? What do you do to reduce this risk? |
| * A mother with TB has a sick newborn or infant who requires inpatient care. How do you reduce the risk of that mother transmitting TB to other sick infants while caring for her baby? |
| * Are TB patients informed about basic infection control principles that they could implement at home? Is there any opportunity (for example, home visits) where the messages about infection control could be reinforced, and the entire household could be educated? |

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| **Practice Case 1: Contact Screening** | |
| **http://2.bp.blogspot.com/-gygvlpX4n-4/UVE5nVG-8rI/AAAAAAAACGw/-1Y7oc4Bg6Y/s1600/Question_mark.png** | Lamin is a 33-year-old male patient diagnosed with sputum smear positive TB at his local clinic. Trainees were presented with all the people Lamin is regularly in contact with, and decisions had to be made based on assessing the individual scenario of each contact. |
| |  |  |  |  |  | | --- | --- | --- | --- | --- | | Contact | Age | Relationship to Index Case | TB Symptoms | HIV Status | | Adama | 32 years | Wife | No | Infected | | Backary | 8 years | Son | Yes | Uninfected | | Bai | 4 years | Daughter | No | Uninfected | | Ebrima | 8 months | Daughter | No | Uninfected | | Loli | 8 years | Resides in same building, Cared for by index case | No | Infected | | Sainey | 2 years | Resides in same building, Cared for by index case | Yes | Uninfected | | Foday | 7 years | Visitor | No | Uninfected | | |

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| **Questions** | | | |
| 1. What are the four key things that you need to consider when evaluating all contacts exposed to a person with infectious TB? | | |  |
| 2. What factors do you need to consider when assessing the degree of exposure and therefore risk of TB infection for the contacts? | | |  |
| 3. How will your approach differ between 4-year-old, asymptomatic, and HIV negative Bai and 2-year-old Sainey, who is also HIV negative but presented with possible TB symptoms? | | |  |
| 4. Sainey was treated at the clinic with antibiotics, and returned to you for follow up one week later. All his symptoms resolved, and he is clinically asymptomatic at this visit. What would your next action be in terms of Sainey’s health care? | | |  |
| 5. How will your approach differ between Foday (7-years-old, HIV uninfected, and asymptomatic) and Loli (8-years-old, HIV-infected, and asymptomatic)? | | |  |
| 6. At the first follow up visit, 8-month-old Ebrima’s mother reported that she (Ebrima) developed possible TB symptoms. What action would you take? | | |  |
| * 7. After 2 months of IPT, Loli’s family move to another house, and she is no longer in contact with Lamin. Her mother asks you whether she needs to continue or stop IPT. What do you tell her? | | |  |
| 8. After you have discussed the implications of TB exposure in children, Lamin tells you that his cousin and her 10-month-old baby girl stayed with them for the preceding 6 months. They moved out of the household into their own house two weeks before the TB diagnosis. While they were staying with them, Lamin was looking after the baby during the day as her mother was working. What do you need to tell Lamin about the risk for this child? Does this baby still need to be screened and given IPT, as they did not stay in the household anymore when Lamin was diagnosed with TB? | | |  |
| 9. What would you do if Adama (Bai’s mother) tells you that they do not want their child to start/continue IPT? | | |  |
| 10. What questions should we ask to make sure we identify all at risk contacts after diagnosing an infectious TB case? If a patient is working, they might spend substantial time with colleagues, who might be at risk. If they are a teacher, or working at a school for young children, what should you advise them? And what further steps need to be taken if a TB patient is working with or around young children? | | |  |
| **Discussion Questions**  http://eswt.net/wp-content/uploads/2011/06/roundtable.gif | | | |
| 1. How does this case from the module differ from cases you see in your setting? How is it similar? | |  | |
| 2. Are there challenges faced in your setting that are not addressed in the cases? | |  | |
| **Practice Case 2: Infection Control Counselling** | | | |
| **http://2.bp.blogspot.com/-gygvlpX4n-4/UVE5nVG-8rI/AAAAAAAACGw/-1Y7oc4Bg6Y/s1600/Question_mark.png** | Lily has just been diagnosed with sputum smear-positive TB, and has four children living with her. She also has a 9-month old daughter that she is still breastfeeding. | | |
| **Questions** | | | |
| 1. Can Lily continue breastfeeding? What would you advise her? | |  | |
| 2. What can Lily do in her household to reduce the risk of transmission to the other household members? | |  | |
| 3. Relating to infection control, what are the important principles of TB that you need to educate Lily about? | |  | |
| 4. As Lily is still infectious at the moment, what factors inside the clinic can help reducing the chance of her infecting other patients or health care workers inside the clinic? | |  | |
| **Discussion Questions**  http://eswt.net/wp-content/uploads/2011/06/roundtable.gif | | | |
| 1. How do the cases from the module differ from cases you see in your setting? How are they similar? | |  | |
| 2. Are there challenges faced in your setting that are not addressed in the cases? | |  | |

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| **Role Play Scenarios**  http://funtech2000.files.wordpress.com/2012/09/communication.jpg | **Role Play 1: Explanation of preventive therapy to a mother whose child you are starting on IPT following household TB exposure**  Bai is the 4-year-old daughter of Lamin, who has been diagnosed with smear positive TB the previous week. She is HIV negative, has no symptoms or signs of TB on history or clinical examination, but due to her close contact with Lamin you would like to start her on IPT. |
| Role of Healthcare Worker  http://www.flaticon.com/png/256/16746.png | Counsel Bai’s mother regarding Bai’s risk for TB, explaining the need for preventive therapy, as well as treatment considerations and follow up.   * Risk of disease following exposure * Duration of treatment * How to give medication, and when to repeat dosages if Bai has vomited * Explain side effects of the drugs, and also important side effect symptoms that parents need to be aware of to identify early complications (specifically relating to hepatotoxicity) * Follow up – adherence and duration |
| Role of Caregiver | * Ask the provider why your child needs medication since she does not have TB. * Ask about the risks and benefits of preventive therapy. * Ask about treatment duration, and side effects. |
| Role of Observer | Evaluate and provide feedback on how the healthcare worker did the following:   * Established trust and rapport * Identified and addressed patient’s concerns * Exhibited confidence * Demonstrated professionalism * Used simple language and had clear explanations * Listened carefully * Exhibited non-judgmental behaviour |

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| **Role Play Scenarios**  http://funtech2000.files.wordpress.com/2012/09/communication.jpg | **Role Play 2:**  **Essential components that need to be addressed at follow-up visits of patients on preventive therapy** |
| Role of Healthcare Worker  http://www.flaticon.com/png/256/16746.png | Adama and Bai are returning for Bai’s first follow up visit, 4 weeks after you started her on IPT.   * What do you need to ask Adama at this visit? * Has Bai developed any symptoms of TB? * Have they been experiencing any problems relating to administration of the medication? * Is she experiencing any side effects of the medication? * Participants need to be specific – not ask just about side effects, but ask about nausea, vomiting and abdominal pain. * Infection control also needs to be addressed. Counselling of a TB case about infection control measures in the household |
| Role of Caregiver | * Answer the healthcare worker’s questions and respond with concerns if the answers give reason to do so. |
| Role of Observer | Evaluate and provide feedback on how the healthcare worker did the following:   * Established trust and rapport * Identified and addressed patient’s concerns * Exhibited confidence * Demonstrated professionalism * Used simple language and had clear explanations * Listened carefully * Exhibited non-judgmental behaviour |

**Summary of Key Learning Points:**

This module covered a wide spectrum of TB prevention activities including BCG vaccination and isoniazid preventive therapy (IPT), as well as infection control measures in the household and the clinic.

* BCG vaccination can protect young children from the most severe forms of TB
* The BCG vaccine should be given to babies at birth. It is very safe, but in some rare situations can cause minor side effects
* After someone is diagnosed with TB, contact tracing should be carried out
* Contact tracing identifies family members/contacts that have already developed active TB and it identifies family members/contacts that would benefit from IPT, which significantly reduces the risk of developing TB disease
* Any contact who has symptoms or signs of TB should be referred for evaluation at the clinic
* Clinically well contacts who are less than 5 years of age or any well contacts who are HIV-infected, regardless of age are eligible for IPT
* After a patient has been diagnosed with TB disease, it is important to educate the family on infection control in the house. This includes keeping windows open as much as possible, sleeping in a separate bed for the first two weeks of treatment and avoiding crowded places.
* Infection control in the clinic is also important and includes opening windows, having outdoor waiting areas, separating people coughing from other people waiting for treatment (especially people who are very vulnerable to TB such as young children and HIV-infected persons), and wearing an N95 respirator when seeing patients who are coughing
* Patients with EPTB should may also have PTB and should be evaluated for this.

## Module 6: Practice/Conclusion

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| **Practice Cases and Discussion Questions**  **http://2.bp.blogspot.com/-gygvlpX4n-4/UVE5nVG-8rI/AAAAAAAACGw/-1Y7oc4Bg6Y/s1600/Question_mark.png**  http://eswt.net/wp-content/uploads/2011/06/roundtable.gif | How do the cases from the module differ from cases you see in your setting? How are they similar?  Are there challenges faced in your setting that are not addressed in the cases? |