

CLINICAL DECISION-MAKING FOR DRUG-RESISTANT TUBERCULOSIS (DR TB)

(Course leaders: Lut Lynen & Bouke De Jong)

GENERAL DESCRIPTION

Drug-resistant tuberculosis (DR TB) is an important challenge for clinicians. With the introduction of molecular diagnostic tests, such as the Xpert MTB/RIF assay and Line Probe Assays, the notification of DR TB is increasing and the time to diagnosis can be shortened, allowing earlier treatment initiation. Shorter treatment regimens of nine months duration are now also recommended by WHO, thus simplifying treatment for patients and National TB Programs alike. Newly updated WHO guidelines give a prominent role to new and repurposed drugs, such as bedaquiline, linezolid and clofazimine. Clinicians require training in the use of these new diagnostic tools and in making informed choices for treatment initiation and monitoring and in adequate and timely clinical decision making. Moreover, there is a need to contextualize generic guidelines making them applicable to local settings.

This blended course offers interdisciplinary and interactive training on clinical aspects of DR TB diagnosis and care. It consists of a seven-week online training (8 hours/week) followed by ten days face-to-face.

NUMBER OF CREDITS

5 ECTS

CONTENT

The following subjects will be addressed:

- epidemiology of DR TB in the participant's setting
- identification of persons to be evaluated for DR TB
- diagnosis of DR TB using phenotypic and genotypic methods
- dealing with discordant diagnostic test results
- DR TB classification
- activity and therapeutic efficacy of the different TB drugs and regimens
- criteria for choosing the most appropriate treatment regimen, with a special focus on the short treatment regimen
- clinical-decision making, and the concept of treatment threshold
- design of treatment regimens for patients with adverse drug events and/or resistance to one or more DR TB drugs
- management of DR TB patients with co-morbidities
- monitoring of treatment effectiveness (including efficacy and tolerance), surveillance of drug-resistance
- DR TB care program implementation, including new drugs and regimens

During the online part the case studies are provided by the course faculty. During the F2F part, case studies are provided by the faculty and the participants.

Online module (includes a break of 2 weeks):

- 7 weeks address the following subjects:
 - Epidemiology of DR TB in the participant's setting (1 week)
 - Phenotypic and genotypic diagnostic tests for DR TB (2 weeks)
 - Drugs and regimens for DR TB treatment (2 weeks)
 - Clinical decision making in DR TB (2 weeks)
- Each week contains an interactive lecture, an interactive discussion platform.
- During the online phase the student has to submit a total of 5 assignments
- Each week corresponds with an average of 8 hours student investment time

Face-to-face module:

- Interpretation of DST results and implications for treatment in the setting of the participants and lab visit (3 days)
- Interpretation and discussion of evidence on the short and long MDR-TB treatment regimens (1 day)
- Challenges with clinical care for complex cases, such as extensively drug-resistant TB, co-morbidities, adverse drug reactions, ... (3 days)
- Discuss practices concerning treatment delivery options, prevention of drug resistance, monitoring and surveillance of drug resistance (1 day)
- Clinical decision-making: agree on a threshold to diagnose multidrug-resistant TB (1 day)
- Apply guidelines and evidence to case studies presented by participants and faculty (daily during the lectures, plus one full day for the assessment of the personal project)
- Each day includes a wrap up of take home messages of the previous day, case study presentation and debate of questions related to the learning objectives and the presented case study, and short lectures.
- Each day corresponds with an average of 8 hours student investment time

LEARNING OUTCOMES

- Define the problems with DR TB in your country in terms of occurrence, diagnosis and treatment, using available data;
- Assess harm and benefit of clinical decisions in the field of DR TB diagnosis and treatment;
- Formulate contextualized evidence-based recommendations for the prevention, diagnosis and treatment of DR TB for case studies from different contexts.

TEACHING AND WORKING METHODS

At application, a brief written description of a topic that highlights challenges with diagnosis and/or treatment of DR TB (including the clinical problem description, type of patients affected, the importance of the problem, and how clinicians currently deal with this problem in his/her own setting; max length: ½ A4) is required. This topic will be further developed as a case study during the course.

Learning methods include:

- Problem-based learning: During both the online and face to face part, case studies are used. As such, the learning experience fits as much as possible the problems experienced by participants in their programmatic setting. Moreover, face-to-face sessions often start with a case study presentation. Case studies are followed by an interactive debate between participants and experts. At the end of a session, the expert provides a lecture to complement the debate. As such the theory aligns well with the problems identified by participants.
- Flipped learning: During the online part course participants prepare for the face-to-face debates. Most of the theory will be digested at home, which allows students to use the precious class time for interaction with peers and experts. Participants have access to guidelines and other sources of evidence for consultation, and gaps in the evidence base are identified. In addition, challenges and achievements in diagnosing and treating DR TB, as experienced by the participants, will be discussed. The 10 days face-to-face builds further on the content addressed during the online part, and includes group discussions, case presentations, summaries of key learning points by students, and interactive lectures (didactic lecturing accounts for 30% of the contact hours).
- Social constructivism: Course participants will construct their knowledge through debates with peers and experts, and group work

MODE OF STUDY

This course (component) is organized :

- Distance learning (Online)
- Face-to-face (Antwerp)

ASSESSMENT AND ASSESSMENT CRITERIA

Summative assessment of the participants is based on participation during the online part (exercises/assignments based on case studies presented by faculty and online discussions) and development of a case study originating from the participant's own context with a presentation of recommendations at the end of the face-to-face part.

Final score calculation:

The final score is based on five online assignments (1. Critical review of DR-TB cascade in their country, 2. Analysis of DR-TB diagnostic methods available in their country and a proposal for a diagnostic flowchart, 3. Peer review and feedback on the diagnostic flowchart of other participants, 4. Discussion on challenges to access new DR-TB drugs and regimens, 5. Quiz on the building of a conventional and short MDR-TB regimen) during the online part (50%) and a personal project during

the F2F part; analysis of a case study with recommendations for DR-TB care contextualized to the setting of the participants (50%). This personal project is presented and defended in front of a jury of DR-TB experts. This final assessment includes 10 minutes presentation and 10 minutes for “questions and answers”.

1. As the face-to-face part builds on the online part, participants who fail to participate during the online part in at least 6 out of 7 discussion forums will not be allowed to join the face-to-face part in Antwerp; participants also fail if they don't submit all 5 online assignments

2. Criteria for the score on the presentation of the case study during the face-to-face part will consist of the following:

- introduction (context of the program, patient history, clinical presentation, available lab results) & problem statement;
- formulation of recommendations for diagnostic tests and treatment within the current program;
- balance benefit / harm of clinical decisions;
- formulation of recommendations for implementation of new diagnostic tools / treatment to treat optimally the described case.
- response to questions

LITERATURE

- Van Deun A, Decroo T, Piubello A, de Jong B C, Lynen L, Rieder H L. [Principles for constructing a tuberculosis treatment regimen: the role and definition of core and companion drugs. Int J Tuberc Lung Dis 2018;22:239-245. Int J Tuberc Lung Dis 2019 \(in press\).](#)
- Van Deun A, Decroo T, Kuaban C, et al. Gatifloxacin is superior to levofloxacin and moxifloxacin in shorter treatment regimens for multidrug-resistant tuberculosis.
- Aung K J M, Van Deun A, Declercq E, et al. [Successful '9-month Bangladesh regimen' for multidrug-resistant tuberculosis among over 500 consecutive patients. Int J Tuberc Lung Dis 2014;18:1180-1187.](#)
- Piubello A, Hassane Harouna S, Souleymane M B, et al. [High cure rate with standardised short-course multidrug-resistant tuberculosis treatment in Niger: no relapses. Int J Tuberc Lung Dis 2014;18:1188-1194.](#)
- [World Health Organization. Global tuberculosis report 2018. World Health Organization Document 2018;WHO/CDS/TB/2018.20.](#)
- [World Health Organization. WHO consolidated guidelines on drug-resistant tuberculosis. World Health Organization Document 2019;WHO/CDS/TB/2019.3](#)

OTHER STAFF INVOLVED IN THE COURSE (in addition to those who teach every year, other experts join, depending on availability)

- Anita Mesic, Médecins Sans Frontières Operational Centre Amsterdam
- Armand Van Deun, Damien Foundation and Institute of Tropical Medicine Antwerp, Department of Biomedical Sciences
- Bouke de Jong, Institute of Tropical Medicine Antwerp, Department of Biomedical Sciences

- Leen Rigouts, Institute of Tropical Medicine Antwerp, Department of Biomedical Sciences
- Pauline Lempens, , Institute of Tropical Medicine Antwerp, Department of Biomedical Sciences
- Lut Lynen, Institute of Tropical Medicine Antwerp, Department of Clinical Sciences
- Tom Decroo, Institute of Tropical Medicine Antwerp, Department of Clinical Sciences
- Alberto Piubello, Damien Foundation and The Union
- Gunta Dravniece, KNCV Tuberculosis Foundation
- Emmanuel André, Laboratory of Clinical Bacteriology and Mycology, KU Leuven

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