

Multi-drug Resistant Tuberculosis (MDR-TB)

What is TB?

Tuberculosis (TB) is a serious but treatable disease caused by a bacterium (germ) called *Mycobacterium tuberculosis* (occasional cases may be caused by *Mycobacterium bovis*). TB usually affects the lungs ('pulmonary TB'), but it can also affect other parts of the body, such as lymph nodes, brain, kidneys, bowel, or bones ('extrapulmonary TB').

For more general information about TB, see the Auckland Regional Public Health Service TB fact sheet – go to www.arphs.health.nz and click 'Public Health Topics' and then 'Disease and illness'.

What is multi-drug resistant TB (MDR-TB)?

MDR-TB is TB that is resistant to the two most powerful first-line TB medicines, isoniazid and rifampicin. Therefore MDR-TB needs to be treated with second-line TB medicines. In some cases of MDR-TB, the TB germs may be resistant to other first-line and/or second-line TB medicines too. Extensively drug resistant TB (XDR-TB) is a rare type of MDR-TB that is resistant to isoniazid and rifampicin and is also resistant to some of the second-line TB medicines – any fluoroquinolone and at least one of the three injectable second-line drugs (amikacin, kanamycin and capreomycin).

How is MDR-TB spread, and can I catch it easily?

MDR-TB spreads in the same way as drug-susceptible TB – from person to person through the air. TB germs get into the air when a person with TB disease of the lungs or throat coughs, sneezes, speaks or sings. These germs can stay in the air for several hours, especially in enclosed spaces. Persons breathing in air containing TB germs can become infected. However, just like drug sensitive TB, MDR-TB is not easy to catch – it usually takes many hours of close contact with a person who has infectious MDR-TB, for close contacts to be infected.

How does TB drug resistance happen, and how can it be prevented?

MDR-TB is more common amongst people who have been treated for TB in the past, and have subsequently developed active TB disease again. Resistance to TB medicines can develop when TB medicines are not prescribed correctly or are not taken correctly. Examples include health care providers who treat TB incorrectly (e.g. prescribe the wrong medicines, the wrong dose or too short a treatment course); people who have TB who do not take their TB medicines correctly (e.g. don't take the medicines until the end of the course, take medicines irregularly, take some tablets but not others); drug supply issues in a country (e.g. when TB medicine stocks run out); and drug quality issues (e.g. poor quality TB medicines).

Once MDR-TB is common in an area of the world, there is a greater chance that people living there may be exposed to people with infectious MDR-TB, and if they become infected as a result of that

exposure, will be infected with an MDR-TB strain. Therefore MDR-TB can occur in people who have never had previous treatment for TB.

The most important way to prevent MDR-TB is for people with TB disease to take all their TB medicines exactly as prescribed, until the end of the treatment course, without missing doses or stopping early. Health care providers can help prevent MDR-TB by diagnosing TB cases quickly, following recommended TB treatment guidelines, monitoring the response to treatment and making sure that patients complete their treatment.

How is MDR-TB treated?

MDR-TB can be cured. However compared with drug-susceptible TB disease, MDR-TB is much more difficult to treat, there are more side effects, treatment takes much longer and it is much more expensive. For the best chance of cure, people with MDR-TB disease must take second-line TB medicines daily or twice daily, usually for two years. To avoid worse drug resistance, it is essential that people with MDR-TB disease take their medicines exactly as prescribed.

In New Zealand, treatment of MDR-TB is always by directly observed therapy (DOT), where the patient is given the TB medicines by a nurse who watches the medicines being swallowed. DOT ensures that medication is taken exactly as intended and without any breaks in treatment. This has been shown to maximise cure rates and to minimise the development of further drug resistance in MDR-TB patients.

How is latent TB infection (LTBI) due to exposure to MDR-TB followed up?

The initial infection with the TB germ is called latent TB infection (LTBI). Only 5-10% of people who have LTBI go on to develop active TB disease at some stage in their lives – therefore 90-95% of people with LTBI will never develop active TB disease.

First-line TB medicines, usually isoniazid, are often used to treat people with LTBI who were exposed to drug-susceptible TB cases, as there is good evidence to show that this reduces the risk of their developing active TB disease in future.

However there is no current evidence to support the use of second-line TB medicines to treat people with LTBI who are close contacts of a person with MDR-TB. Follow up of contacts of an MDR-TB case usually includes chest X-rays every 6 to 12 months for two years, as part of close monitoring for development of active TB disease.

What role does the Auckland Regional Public Health Service (ARPHS) play?

Tuberculosis is a notifiable disease in New Zealand. Any doctor who suspects or confirms a diagnosis of TB disease is required to notify the local public health service. MDR-TB treatment is prescribed by a TB specialist (a chest or infectious diseases specialist who is experienced in the management of MDR-TB).

Auckland Regional Public Health Service (ARPHS) is the public health service for the greater Auckland region. The responsibility of ARPHS is to assist and supervise all Auckland residents with TB, including those with MDR-TB, to complete their treatment, and to follow up any close contacts who may need testing. Public health nurses supervise TB treatment in the community. Treatment of MDR-TB is always by once or twice daily directly observed therapy (DOT).

For further information about TB, see the Centres for Diseases Control website at www.cdc.gov or the World Health Organization website at www.who.int , or if you have concerns about TB call Auckland Regional Public Health Service on 09 623 4600.

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