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Your Guide to Managing

Multi Drug-resistant Organisms (MDROs)

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ABOUT

Multi Drug-resistant Organisms (MDROs)

Drug-resistant organisms are bacteria which some antibiotics can no longer be used to control or kill them. Bacteria that are resistant to more than one antibiotic are called Multi Drug-resistant Organisms (MDROs).

These bacteria can sometimes be found on our skin and / or in our intestines. **Generally, healthy individuals may carry these bacteria without becoming ill.** However, these bacteria can cause infections in urine, blood or wounds, **especially** in some people, who are very ill or whose immunity is very low.

Although there may be antibiotics available to treat these infections, the choices are limited. The best way to manage MDROs is through **prevention**. This booklet shares useful tips on how people with MDROs and their families/caregivers can manage the condition and lead a normal life.

How do I know if I have a MDRO?



Certain tests are ordered by the doctor to diagnose the presence of MDROs. Your doctor or nurse will let you know if you have a MDRO.

The more common MDROs in Singapore are:

- **MRSA:** Methicillin-resistant *Staphylococcus aureus*
- **VRE:** Vancomycin-resistant *Enterococci*
- **CP-CRE:** Carbapenemase Producing Carbapenem-resistant *Enterobacteriaceae*
- **MRAB:** Multi-resistant *Acinetobacter baumannii*

To learn more about these MDROs, please refer to the Appendix on page 9.

Who has MDROs?



People with MDROs are categorised into **two** groups:

a) **Colonised** with MDRO (MDRO carriers)

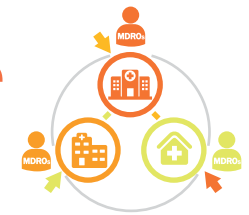
If you are colonised with MDRO, it means you carry the MDRO bacteria but are not ill with it. You will not have any symptoms, such as a fever or wound infection. Most people do not know they are MDRO carriers, unless they undergo certain tests. People who are colonised with MDRO tend to remain colonised for months or years.

If you are colonised with MDRO, you do **not** usually need treatment. However, if you need medical treatment or an operation, your doctor will decide whether you need to be treated for MDRO first.

b) **Infected** with MDRO

If you become ill with MDROs, you are said to be infected with MDRO. You may have signs and symptoms such as fever and/or worsening wound infection (hot, redness, pus, swelling and increasing pain). Your doctor will usually prescribe antibiotics to treat the MDRO infection.

I am colonised with MDRO. Can I go to the healthcare facilities in the community?



Yes, you can continue to go to healthcare facilities in the community. You do not need to be separated from others usually, unless your doctor has concerns that your infection could be transmitted. For example you may have some signs and symptoms such as:

- Wound infection with pus
- Chest infection with cough that produces a lot of phlegm
- Severe diarrhea

People who are colonised with MDROs, should ensure good levels of hand hygiene especially after using the toilet.

Who is at risk of a MDRO infection?



Healthy people are at low risk of developing MDRO infections.

Those who are at greater risk of developing MDRO infections include:

- People with poor personal hygiene
- People on long-term antibiotics
- People with prolonged or repeated hospital stay
- People with a tube inserted into their body (e.g. urinary catheter)
- People with weak immune system (e.g. kidney dialysis, transplant and cancer patients)

How do MDROs spread?



MDROs are commonly spread from person-to-person and mostly by hands. For example, when a person comes into direct contact with the contaminated hands of another person or when a person touches a contaminated object like door handles or exercise equipment.

How can I prevent the spread of MDROs?



You can prevent the spread of MDROs by:

- Cleaning your hands at the appropriate moment with soap and water or alcohol-based hand sanitisers.
- Keeping open wounds, cuts and abrasions cleaned and covered with clean bandage, until healed.
- Avoiding close contact with people who have skin infections or open wounds.
- Not sharing your personal items with other people.
- Washing your clothes, towels and linen (items that come in contact with wounds) separately from other household members' items. These are to be washed with hot water and laundry detergent.
- Cleaning your home daily especially areas or things you often touch, such as door handles.
- Informing all healthcare workers if you are a MDRO carrier.



Information for family members and healthcare workers caring for people who are colonised with MDRO.

You should do the following:

- Clean your hands with soap and water or alcohol-based hand sanitisers, before and after coming into contact with the person.
- Wear gloves when coming into contact with the person's body fluids such as blood or urine (e.g. when draining the urine bag or when changing the wound dressing).
- Dispose used dressings and gloves in a plastic bag, before throwing them away.

Common types of MDROs

What is MRSA?

Methicillin-resistant *Staphylococcus aureus*

Staphylococcus is a bacterium commonly found on the **skin** and **mucous membrane** of healthy people e.g. nose. **MRSA** is a type of Staphylococcus aureus that is resistant to the antibiotic Methicillin. This limits the option of antibiotic in treating an infection.

MRSA exists in the environment and anyone in the community can contract **MRSA**. Generally, this bacterium is harmless to healthy individuals. However, it may cause wound, skin or blood stream infection in some individuals, if it enters the body through cuts or surgical wounds.

What is VRE?

Vancomycin-resistant *Enterococci*

Enterococci are bacteria normally present in the **human intestines**, **female genital tract** and even the environment.

VRE is a type of enterococcus bacterium that has become resistant to the antibiotic Vancomycin.

What is CP-CRE?

Carbapenemase Producing Carbapenem-resistant *Enterobacteriaceae*

Enterobacteriaceae is a family of bacteria commonly found in the **human intestines**. Enterobacteriaceae can cause infections if they enter the bloodstream, bladder, or other areas of the body.

CP-CRE refers to Enterobacteriaceae which has developed resistance to a class of antibiotics called Carbapenem by producing an enzyme called carbapenemase to break down the antibiotic.

What is MRAB?

Multi-resistant *Acinetobacter baumannii*

Acinetobacter is a bacterium commonly found in the **environment**, including water and soil.

It can also be found on the **skin** of healthy people, who carry it harmlessly. This bacteria is resistant to, and cannot be destroyed by a range of common antibiotic treatments.

Disclaimer

This booklet is not intended as a substitute for the medical advice of a doctor. The reader should consult a doctor in matters relating to his/her health, and particularly with respect to any symptoms that may require diagnosis or medical attention.

Acknowledgement

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**National Infection Prevention
and Control Committee**
Ministry of Health

When should I wash my hands?



When hands are visibly dirty



Before, during and after preparing food



Before eating



After using the toilet



After blowing your nose, coughing or sneezing



After handling garbage



After handling dirty linen



Before and after touching body fluids and/or wound dressings

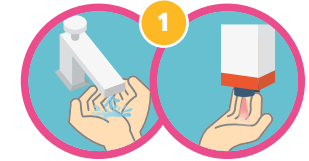
Hand hygiene is very important to prevent the spread of MDROs.

HOW TO HANDRUB? with alcohol-based hand sanitiser



Apply a palmful of the sanitiser in a cupped hand and cover all surfaces

HOW TO HANDWASH? with soap and water



Wet hands with water Apply enough soap to cover all hand surfaces



Palm to palm



Back of hands



Between fingers



Back of fingers



Thumbs



Fingernails



Rinse hands with water



Dry thoroughly with a single use towel



Use towel to turn off tap

20-30 sec



Once dry your hands are safe!



Once dry your hands are safe!