

Letterkenny University Hospital - LUH Antimicrobial Prescribing Policy/Guidelines: Note Regarding Multi-drug Resistant Organisms (MDRO)

MDRO general information

Multi-Drug Resistant Organisms (MDRO) General Information

- MDRO are organisms exhibiting resistance to one or more groups of antimicrobials. They include Gram-negative organisms such as extended-spectrum beta-lactamase (ESBL)-producing bacteria and carbapenemase-producing Enterobacteriaceae (CPE), and Gram-positive organisms such as methicillin resistant *Staphylococcus aureus* (MRSA) and vancomycin resistant Enterococci (VRE).
- Check with the patient and the patients records to determine if they are already known to be colonised with one or more MDRO or if they require testing for colonisation with MDRO.
Patients **at risk** for acquisition of MDRO include:
 - Prior and prolonged hospitalisation.
 - Residents of long term care facilities.
 - Exposure to multiple antimicrobials, especially broad spectrum antimicrobials.
 - The presence of indwelling medical devices, particularly urinary catheters.
- Discuss with Microbiology if patient suspected or known to be colonised with MDRO as alternative regimens for treatment or surgical prophylaxis may be required.

References:

1. [HPSC Guidelines for the Prevention and Control of Multi-drug resistant organisms \(MDRO\) excluding MRSA in the healthcare setting 2014](#)
2. *National Clinical Effectiveness Committees Guideline No. 30 Infection Prevention and Control*
<https://www.gov.ie/en/publication/a057e-infection-prevention-and-control-ipc/>

Note Regarding Carbapenemase-Producing Organisms (CPO) and Carbapenemase Producing Enterobacteriaceae (CPE)

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- CPO are Gram-negative bacteria that carry genes for resistance to carbapenems (e.g. meropenem). They are often resistant to carbapenems and to many other antimicrobial agents.
- CPE are the most common subset of CPO. CPE are mostly *K. pneumoniae*, *E. coli*, and *Enterobacter spp.* but other species of Enterobacterales may also have this mechanism of resistance.
- Most patients who are colonised with CPE are identified from routine testing of rectal swabs or faeces. Colonisation means the organism is present but is not associated with infection.
- There is no antimicrobial treatment that has been shown to be useful in clearing gut colonisation with CPE or other CPO. There is good reason to believe that giving antimicrobial treatment to colonised patients supports persistent colonisation.
- When patients colonised with CPE or other CPO develop infection it may be caused by the CPE or by other organisms. If the patient is seriously ill the initial empiric treatment may need to cover for the CPE they are colonised with.
- Treatment options in cases of infection with CPE are limited. If a patient with CPE from a rectal screen and/or clinical sample develops clinical evidence of an infection **ALWAYS discuss antibiotic therapy with Microbiology**.

References:

1. [HPSC Guidelines for the Prevention and Control of Multi-drug resistant organisms \(MDRO\) excluding MRSA in the healthcare setting 2014](#)
2. [HPSC Carbapenemase Producing Enterobacterales \(CPE\) in Ireland: 2017](#)
3. *National Clinical Effectiveness Committees Guideline No. 30 Infection Prevention and Control*
<https://www.gov.ie/en/publication/a057e-infection-prevention-and-control-ipc/>
4. *Treatment of suspected or confirmed infection with Enterobacterales or Acinetobacter spp. Resistant to carbapenems. Surgical prophylaxis in the context of colonization with such organisms.* [a-guide-to-treatment-of-infection-with-carbapenem-resistant-organism-april-2019.pdf \(hse.ie\)](#)

Note Regarding Extended-Spectrum Beta-Lactamase (ESBL) producing bacteria

Note Regarding Extended-Spectrum Beta-Lactamase (ESBL) producing bacteria

- ESBL are Gram-negative bacteria that produce beta-lactamase enzymes capable of inactivating a wide range of beta-lactam antimicrobial agents. This usually includes most penicillins and cephalosporins. The ESBL species most commonly associated with infection are *E. coli* and *K. pneumoniae*.
- Colonisation with ESBL organisms is now very common in Ireland. Although ESBL colonisation and infection are more common in patients with identifiable risk factors (see above list for MDRO), colonisation has been reported in otherwise healthy members of the general population.
- There is no antimicrobial treatment that has been shown to be useful in clearing gut colonisation with ESBL. There is good reason to believe that giving antimicrobial treatment to colonised patients supports persistent colonisation.
- Most ESBL remain susceptible to nitrofurantoin and fosfomycin which can be effective for treatment of uncomplicated cystitis caused by ESBL.
- For those with complicated urinary tract infection or infection at other sites many ESBL remain susceptible to piperacillin/tazobactam, gentamicin and restricted agents such as meropenem.
- ESBL colonisation is most common in those with extensive healthcare exposure including acute hospitals and long-term residential care facilities for older people. Empiric cover for ESBL blood stream infection with Meropenem should be considered in patients admitted from nursing homes who are critically ill with [Sepsis](#). **Discuss with Microbiology as required.**

Note Regarding Vancomycin Resistant Enterococcus (VRE)

- *Enterococcus faecium* is naturally resistant to many antimicrobial agents. Vancomycin is one of a limited number of agents available for treatment of serious infection with *Enterococcus faecium*. Gut colonisation with *E. faecium* that has acquired resistance to vancomycin is now very common in patients with extensive healthcare exposure.
- There is no antimicrobial treatment that has been shown to be useful in clearing gut colonisation with VRE. There is good reason to believe that giving antimicrobial treatment to colonised patients supports persistent colonisation.
- For patients with serious/life threatening infection who are at risk for VRE infection, empiric treatment with linezolid or daptomycin is generally indicated in addition to the other components of therapy recommended in this guideline. Discuss with Microbiology or as required.

Note Regarding Methicillin Resistant Staphylococcus aureus (MRSA)

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For infection at almost any site you should suspect infection with MRSA if:

- Patient has been previously colonised with MRSA.
- Patient has recently been hospitalised (within 90 days).
- Patient has transferred from another hospital or long-term care facility.
- Patient is on a ward with a current epidemic or endemic MRSA problem.

For patients with serious/life threatening infection who are at risk for MRSA infection, empiric treatment with **Vancomycin** is indicated in addition to the other components of therapy recommended in this guideline. **Discuss with Microbiology as required**.