# Galway: GAPP - Galway Antimicrobial Prescribing Policy / Guidelines (GAPP): Note Regarding Multi-drug Resistant Organisms (MDRO)

## MDRO general information

- MDRO are organisms exhibiting resistance to more than one group of antimicrobials. They include Gram-negative organisms such as extended-spectrum beta-lactamase (ESBL)-producing bacteria and carbapenemase-producing Enterobacterales (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 identifiable increased risk for colonisation or infection with MDRO include:
  - Those with prior or prolonged hospitalisation.
  - Residents of long term care facilities.
  - Those exposed to multiple antimicrobials, especially broad spectrum antimicrobials.
  - Those with indwelling medical devices, particularly urinary catheters.
  - Recent travel to countries where MDROs are more common, in particular if they have received healthcare in those countries.
- Discuss with Microbiology or Infectious Diseases if patient suspected or known to be colonised with MDRO as alternative treatment or surgical prophylaxis regimen may be required.

*Refs:*

1. *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 Enterobacterales (CPE)

- 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 often limited. If a patient with CPE from a rectal screen and/or clinical sample develops clinical evidence of an infection seek advice on antimicrobial therapy from Microbiology or Infectious Diseases as appropriate.

*Refs:*

1. *National Clinical Effectiveness Committees Guideline No. 30 Infection Prevention and Control* https://www.gov.ie/en/publication/a057e-infection-prevention-and-control-ipc/
2. *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

- 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 or Infectious Diseases 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 Infectious Diseases as required.

### Note Regarding Methicillin Resistant Staphylococcus aureus (MRSA)

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 or Infectious Diseases as required.