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EXTENDED-SPECTRUM BETA LACTAMASE (ESBL) INFECTIONS

Extended-Spectrum Beta Lactamases (ESBL) are enzymes that confer resistance to most beta-lactam antibiotics. ESBL infections are associated with poorer clinical outcomes (increased mortality, length of hospital stay)[1]. The most recent antibiogram released by Calgary Lab Services (CLS), indicate that some species that secrete ESBL have as high as 70% resistance to sulfamethoxazole/trimethoprim and approximately 40% for quinolones[2]. As per CLS protocol, long-term care (LTC) facilities are informed via fax or phone anytime an ESBL infection is discovered in a specimen.

In addition to observing proper infection control practice for ESBL organisms, it is important to treat the infections in a responsible and expedient manner. Potential sources of infections (e.g. catheters) should be avoided or removed if possible, regular hydration should be encouraged, and thorough perineal hygiene should be performed at all times[3]. Antibiotics should only be considered if signs and symptoms warrant treatment. If clinical assessment determines that the infection requires antibiotic therapy (e.g. asymptomatic bacteriuria should **not** be considered for treatment), please consider the following points in ESBL treatment:

<u>If an ESBL infection requires treatment at the facility,</u>

Consider the following:

Nitrofurantoin (Macrodantin ®)

- A good alternative for lower urinary tract infections. Viable in renal function as low as 40mL/min[4] (despite common literature stating 60mL/min as the lower limit)

Amoxicillin-Clavulanic Acid (Clavulin®)

- Oral dosing of amoxi-clav is recommended for UTI treatment even if the lab reports only intermediate susceptibility; concentration levels in urine should still be sufficient **(note this applies only to UTI)**

Aminoglycosides (formulary: gentamicin, tobramycin)

- Remain a viable option for treatment(taking into account risk factors such as decreased renal function)

<u>If hospitalization is being considered</u>

If aminoglycosides are **not** an option and transfer to hospital is being considered, ER avoidance may be achieved with on-site treatment with ertapenem or fosfomycin. The attending physician is encouraged to call the CLS microbiologist on call (MOC) at **<u>403-770-3757</u>**

Ertapenem (Invanz®) – available through special authorization process

- The MOC can release the results of an ertapenem culture to facility staff
- Ertapenem is a carbapenem antibiotic restricted in AHS acute care to Infectious Disease (ID) approval; due to this criteria, use in LTC is restricted
- Ertapenem may be given intramuscularly as a once-daily dose in the outpatient setting

Fosfomycin (Monurol®) – currently available through non-formulary application

- Fosfomycin (Monurol) is available as an oral treatment alternative for lower urinary tract infections
- Fosfomycin *may* be susceptible for strains of ESBL resistant to standard treatment
- Currently, fosfomycin is not routinely tested by CLS but the test can be specifically ordered by the attending physician
- May be a good alternative to either invasive injectable antibiotics or to hospitalization

References:

1. Munoz-Price, LS. Extended Spectrum Beta Lactamases. In: UpToDate, Hooper, D (Ed), UpToDate, 2012
2. CLS Antibiogram – Calgary Nursing Homes January-December 2011 (http://www.calgarylabservices.com/files/LabTests/MicrobiologyNewsletters/2012_Antibiogram.pdf)
3. Alberta TOP Guidelines – Urinary Tract Infections in Long Term Care. Accessed Nov 7, 2012. (http://www.topalbertadoctors.org/download/400/UTI_algorithm.pdf)
4. AHFS 2012, Mandell Principles & Practice Infectious Diseases 7ed 2009
5. Pitout, J. CLS Microbiology Newsletter – emergence of ESBL (Vol. 4, 2005)
6. Pitout, J. CLS Microbiology Newsletter – Vitek 2 system (Vol. 1, 2006)