

## Carbapenem Use Guideline

Carbapenems (meropenem, ertapenem, imipenem) are among the broadest antibiotics available. Overuse of carbapenems can result in development of resistance [1] and can cause side effects, such as *C. difficile* colitis [2]. In order to preserve carbapenems for as long as possible, CASP recommends that carbapenems are avoided if alternative/more narrow antibiotics can be used.

### Empiric carbapenem use is reasonable in the following scenarios:

1. Critically ill patient at high risk for infection caused by ESBL-producing *Enterobacteriaceae* or other resistant Gram-negative bacteria, such as MDR *Pseudomonas aeruginosa*.
  - a. High risk may include those who have had prior infection or colonization with ESBL-producing *Enterobacteriales* within the prior year or recent (within 90 days) exposure to third or fourth generation cephalosporins.
2. Patient has intolerance or allergic reaction to alternative antibiotics.
3. Confirmed case of infection caused by Gram-negative organism without appropriate alternative antibiotics.

### Examples of Opportunities to Use Carbapenem Alternatives

Infectious Disease State	Preferred Therapy	Notes
<b>Neutropenic Fever</b>	cefepime OR piperacillin/tazobactam	Broadening to carbapenem if patient remains febrile after 5 days is NOT indicated if patient is clinically stable and microbiological data do not support need for carbapenem
<b>HAP/VAP</b>	cefepime PLUS vancomycin OR linezolid; OR piperacillin/tazobactam PLUS linezolid	Consider carbapenem only if patient has history or risk factors of resistant Gram-negative organisms (see above). See <a href="#">UNCMC HAP/VAP Guideline</a> for more info
<b>CAP</b>	ceftriaxone PLUS azithromycin	Carbapenems generally not necessary. See <a href="#">UNCMC CAP Guideline</a> for more info
<b>Intra-abdominal Infection</b>	cefepime PLUS metronidazole OR piperacillin/tazobactam	Consider carbapenem if patient has history or risk factors of resistant Gram-negative organisms (see above).
<b>SBP</b>	ceftriaxone	Case by case use of carbapenem, if patient has history or risk factors of resistant Gram-negative organisms
<b>Infected Pancreatic Necrosis</b>	ceftazidime OR cefepime OR fluoroquinolone PLUS metronidazole OR piperacillin/tazobactam	Carbapenems are often used, but no evidence that they are superior
<b>Acute pyelonephritis</b>	ceftriaxone	See <a href="#">UNCMC UTI Guideline</a> for more info

<p><b>Infected Decubitus Ulcer</b></p>	<p>cefepime PLUS metronidazole +/- Vancomycin OR ceftazidime PLUS metronidazole PLUS vancomycin OR piperacillin/tazobactam +/- daptomycin</p>	<p>Consider carbapenem if patient has history or risk factors of resistant Gram-negative organisms (see above).</p>
<p><b>Diabetic Foot Ulcer</b></p>	<p>cefepime PLUS metronidazole +/- Vancomycin OR ceftazidime PLUS metronidazole PLUS vancomycin OR piperacillin/tazobactam +/- daptomycin</p>	<p>Treatment ideally culture based. Consider carbapenem only if patient has history of resistant Gram-negative organisms</p>

[1] J Antimicrob Chemother 2017; 72: 2410–2417

[2] Clin Infect Dis. 2020 Jan 1; 70(1):11-18

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