

Double Anaerobic Coverage

Anaerobic bacteria are normal GI flora (gram-negative rods *Bacteroides fragilis*, *Prevotella melaninogenica*, and *Fusobacterium*) and mouth flora (gram-positive pathogens *Peptococcus* and *Peptostreptococcus*). Anaerobic coverage may be indicated in various infections including but not limited to intra-abdominal infections, aspiration pneumonia, diabetic foot infections/osteomyelitis, and gynecologic infections.

Gram-positive oral anaerobes are covered by most beta-lactams including penicillin. The following antibiotics have good-excellent coverage of anaerobic gram-negative bacilli such as *B. fragilis*. Use of any combination of the agents below is considered double-anaerobic coverage, which is not necessary.

Antibiotics with anaerobic coverage

Ampicillin/sulbactam	Metronidazole
Piperacillin/tazobactam	Clindamycin
Cefotetan	Tigecycline
Cefoxitin	Moxifloxacin (<i>non-formulary</i>)
All Carbapenems (meropenem, ertapenem, imipenem)	

Guidelines as well as susceptibility and **clinical data DO NOT SUPPORT double-anaerobic coverage.** *B. fragilis*, the most common pathogenic anaerobe, has resistance rates of <1-5% to most beta-lactams including <1% to piperacillin/tazobactam, carbapenems, and metronidazole. Guidelines for intra-abdominal and gynecological infections **recommend anaerobic coverage with a single agent**. Adding metronidazole for anaerobic coverage to antibiotics already with anaerobic activity **HAS NOT** been shown to improve clinical outcomes in patients.

Conclusions: Use of multiple antibiotics with anaerobic activity is not recommended and increases patient risk for adverse drug effects from exposure to unnecessary drugs. **Please refrain from using multiple agents with anaerobic coverage except for the following clinical scenarios:**

EXCEPTIONS:

- Clindamycin can be added for anti-toxin effects in the treatment of necrotizing fasciitis
- Metronidazole can be added for the treatment of *C. difficile*
- Metronidazole can be added to gentamicin + clindamycin regimens for peri-operative prophylaxis for ~24 hours in GYN cytoreductive surgeries or surgeries involving the bowel or bowel contamination

References:

1. Snyderman Dr, Jacobus NV, McDermott LA, et al. Lessons learned from the anaerobe surgery: historical perspective and review of the most recent data (2005-2007). *Clin Infect Dis.* 2010; 50 Suppl 1: S26-33
2. Solomkin JS, Mazuski JE, Bradley JS, et al. Diagnosis and management of complicated intra-abdominal infection in adults and children: guidelines by the Surgical Infection Society and the Infectious Diseases Society of American. *Clin Infect Dis.* 2010; 50:133-64
3. Centers for Disease Control and Prevention. Sexually Transmitted Diseases Treatment Guidelines 2010. *MMWR* 2010;59: RR-12
4. Adlund C, Sabouri S, Nord CE. Comparative in vitro activity of BAY 12-8039 and five other antimicrobial agents against anaerobic bacteria. *Eur J Clin Microbiol Infect Dis.* 1998; 17:193-5