Antimicrobial Activity Chart

Gram-Negative Bacilli

Disclaimer: This document is for educational purposes and not to guide patient-level therapeutic decisions

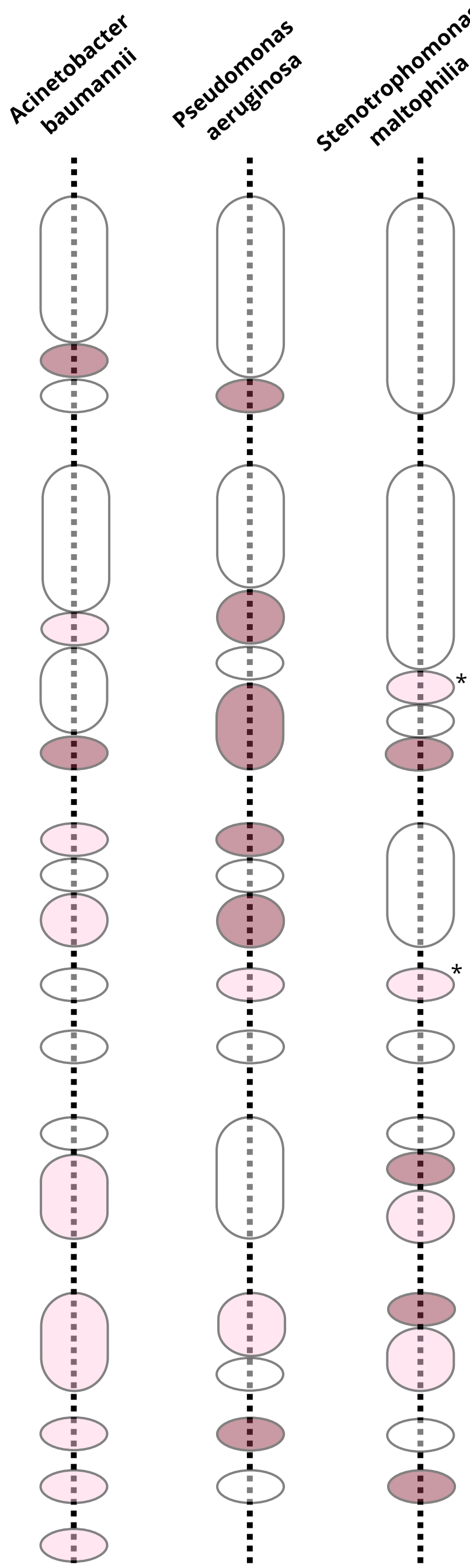
Enterobacterales

- *Glucose fermenter*
  - *Lactose fermenter*
    - **Indole (+)**: *E. coli*, *K. oxytoca*
    - **Indole (-)**: *K. pneumoniae*, *E. cloacae*, *K. aerogenes*, *Citrobacter spp.*, *Serratia spp.*
  - *Non-lactose fermenter*: *Proteus spp.*, *Morganella morganii*, *Providencia spp.*, *Salmonella spp.*, *Shigella spp.*, *Yersinia spp.*
- *Non-glucose fermenter*
  - *Oxidase (+)*: *Pseudomonas spp.*, *Achromobacter spp.*, *Burkholderia spp.*
  - *Oxidase (-)*: *Acinetobacter baumannii*, *Stenotrophomonas maltophilia*

*See **page 3** for antibiotic activity against Enterobacterales*

KEY

- Routinely active
- Variable activity
- No or limited activity



Penicillins
- Penicillin G
- Anti-staphylococcal penicillins (OXA/NAF)
- Ampicillin/Amoxicillin
- Amoxicillin-clavulanate
- Ampicillin-sulbactam
- Piperacillin-tazobactam

Cephalosporins
- 1st Gen (LEX/CFZ)
- 2nd Gen (Cefuroxime)
- 3rd Gen
  - Ceftriaxone/Cefpodoxime
  - Ceftazidime
- 4th Gen (Cefepime)
- Ceftaroline
- Ceftazidime/avibactam*
- Ceftolozane/tazobactam
- Cefiderocol

Carbapenems
- Meropenem/Imipenem
- Ertapenem
- Meropenem/vaborbactam
- Imipenem/relebactam

Aztreonam*

Macrolides

Tetracyclines**
- Doxycycline
- Minocycline
- Eravacycline/ Tigecycline

Fluoroquinolones
- Levofloxacin
- Ciprofloxacin
- Moxifloxacin

Aminoglycosides

TMP/SMX

Colistin/Polymixin B***

***Ceftazidime/avibactam should be given in combination with aztreonam for moderate to severe *S. maltophilia* infections; **Minocycline is the preferred tetracycline for *A. baumannii* infections. Tigecycline may be considered as an alternative. Eravacycline demonstrates in vitro activity but there is limited clinical data to support its use; ***Given significant toxicity and availability of alternative agents, colisitin and polymixin B should be considered as a last-line treatment option in most clinical scenarios**

Created by Megan Klatt, PharmD, BCIDP (last updated July 2022)

Enterobacterales Resistance -- An Overview of Common Terminology

	"AmpC"	"ESBL"	"CRE"
Description	Inducible expression of the ampC beta-lactamase among certain Enterobacterales organisms (AmpC-E)	Presence of extended-spectrum beta-lactamase (ESBL) gene expression	Carbapenem-resistant Enterobacterales (CRE) includes resistance via carbapenemase-producing genes (see below) or other resistance mechanisms
Genotype	Many but not commonly tested in the clinical setting	**CTX-M,** SHV, TEM	**KPC**, NDM/IMP/VIM (metallo-beta-lactamases), OXA-48
Phenotype	3rd generation cephalosporin-resistant **OR** resistance develops with antibiotic exposure	Ceftriaxone-resistant	Resistance to ≥ 1 carbapenem *(i.e., may be ertapenem-resistant but meropenem-susceptible)*
Typical Organisms	**HECK-Yes** *(**H**afnia alvei, **E**nterobacter cloacae, **C**itrobacter freundii, **K**lebsiella aerogenes, **Yer**sinia enterocolitica)*	***E. coli,*** ***K. pneumoniae****,* *K. oxytoca,* *P. mirabilis*	KPC -- ***K. pneumoniae*** Non-carbapenemase-producing, carbapenem-resistant Enterobacterales -- ***Enterobacter spp.****,* *K. pneumoniae, E. coli*

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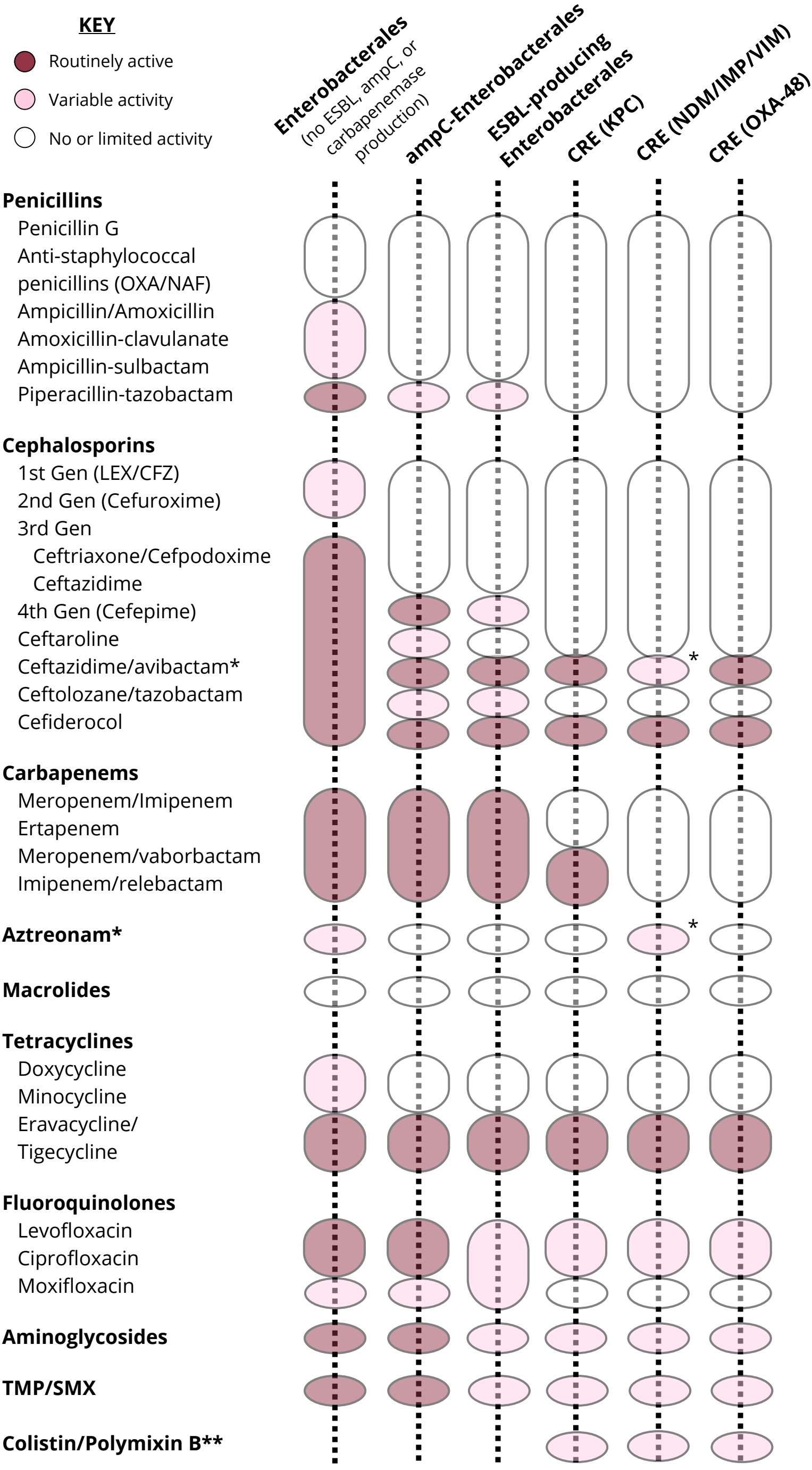

***Ceftazidime/avibactam should be given in combination with aztreonam for CRE due to metallo-beta-lactamases; **Given significant toxicity and availability of alternative agents, colisitin and polymixin B should be considered as a last-line treatment option in most clinical scenarios**