

# Treatment Used and New Agents

Ryan Shields, Pharm.D., MS  
University of Pittsburgh

Jason Pogue, Pharm.D., BCPS-AQ ID

# Initial presentation

- 67 y/o man with poor compliance to medical care presenting with a worsening right foot stump infection
  - PMH: Severe PVD, CHF
    - Refused bilateral amputation
  - Vitals: T=39.4, BP=80/46, WBC=15.6
  - Blood cultures turn positive within 24 hours...



# Reported MIC results (VITEK)

## ENTEROBACTER CLOACAE COMPLEX

	MIC (mcg/mL)	MIC Interpretation
Amikacin .....	16 .....	Sensitive
Aztreonam .....	.....	Resistant
Cefepime .....	32 .....	Resistant
Ceftriaxone .....	32 .....	Resistant
Ciprofloxacin .....	1 .....	Sensitive
Gentamicin .....	4 .....	Sensitive
Imipenem .....	16 .....	Resistant
Meropenem .....	>=16 .....	Resistant
Piperacillin/Tazobactam .	>=128 .....	Resistant
Sulfa/Trimethoprim .....	>=320 .....	Resistant
Tobramycin .....	>=16 .....	Resistant

# Reported MIC results (VITEK)

## ENTEROBACTER CLOACAE COMPLEX

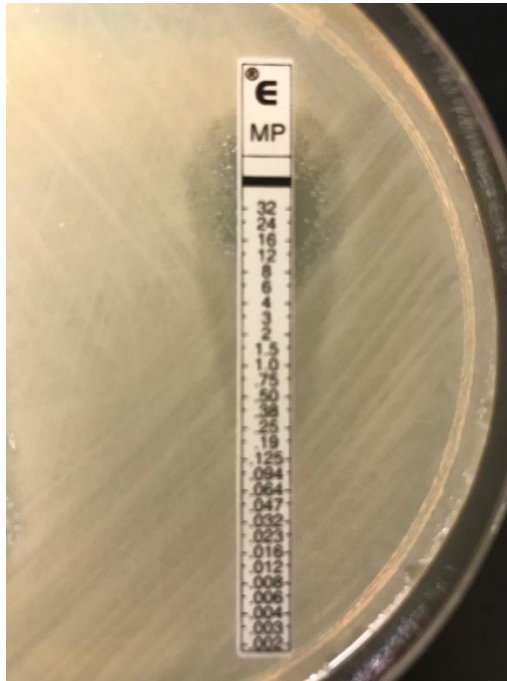
	MIC (mcg/mL)	MIC Interpretation	
Amikacin .....	16 .....	Sensitive	
Aztreonam .....	.....	Resistant	
CEFTAZIDIME/AVIBACTAM ....	>256 .....	Resistant	Resistant
Cefepime .....	32 .....	Resistant	
Ceftriaxone .....	32 .....	Resistant	
Ciprofloxacin .....	1 .....	Sensitive	
Gentamicin .....	4 .....	Sensitive	
Imipenem .....	16 .....	Resistant	
Meropenem .....	>=16 .....	Resistant	
Meropenem/Vaborbactam .	1.0 .....	Sensitive	
Piperacillin/Tazobactam .	>=128 .....	Resistant	
Sulfa/Trimethoprim .....	>=320 .....	Resistant	
Tobramycin .....	>=16 .....	Resistant	

# Huh...?

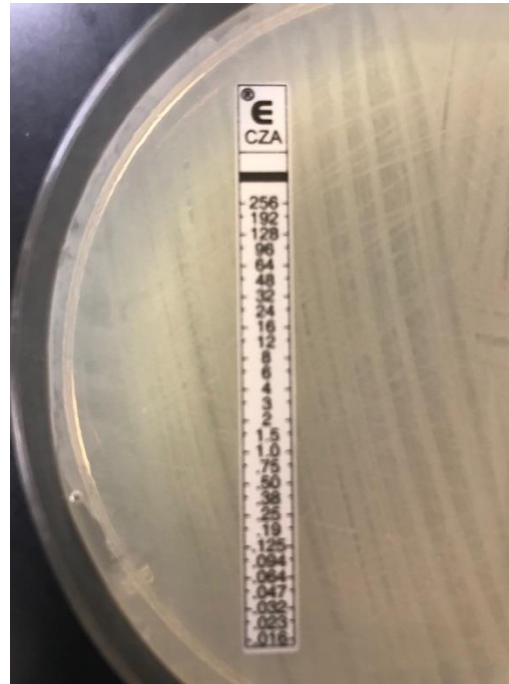
- No prior ceftazidime-avibactam exposure....so what's the mechanism?
- KPC-negative
- Any other ideas?

# Repeat MIC results (Etest)

**Meropenem >32**



**Ceftaz-avi >256**



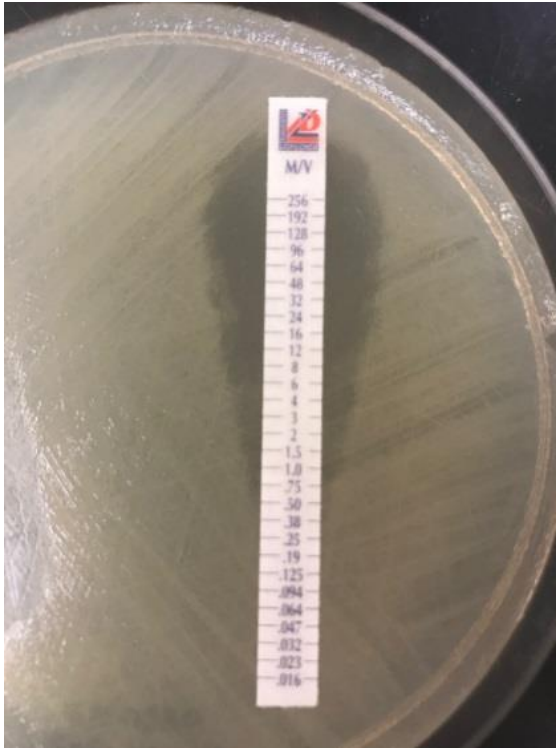
**Mero-vabor = 12**



**Microbiology lab  
reported MIC = 1**

# Why the discrepancy?

- Reading the mero-vapor Etest too early may overcall susceptibility



Read after 9 hours of incubation  
MIC = 1

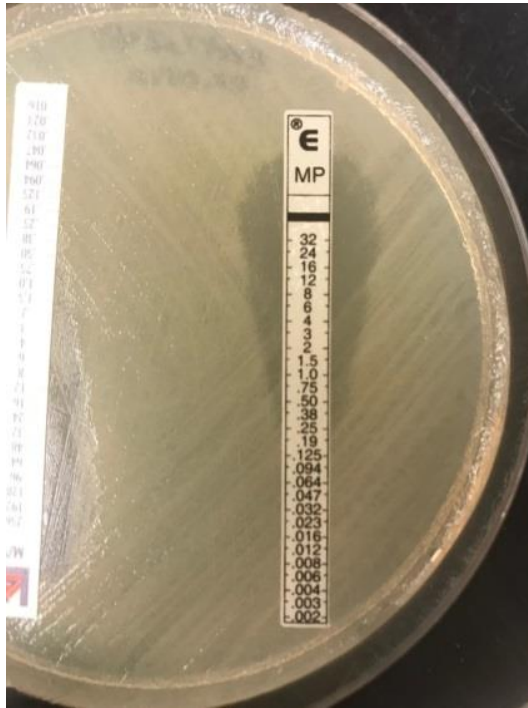


Read after 20 hours of incubation  
MIC = 12

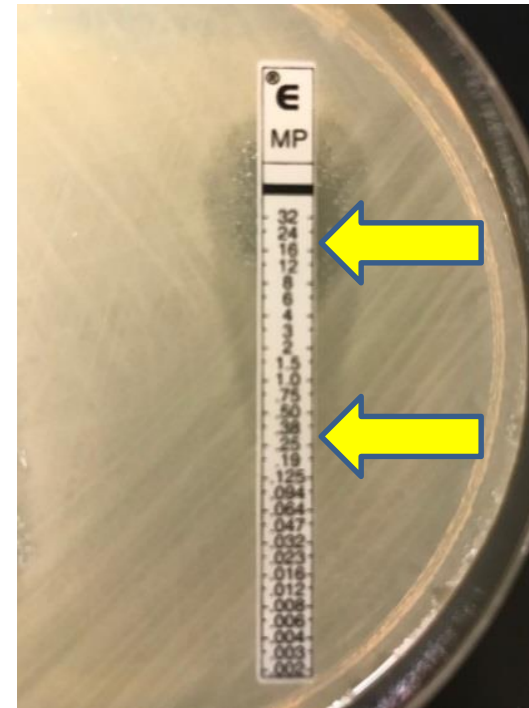
Note the inner zone

# Why the discrepancy?

- This finding is also true for meropenem...



Read after 9 hours of  
incubation  
**MIC = 1**

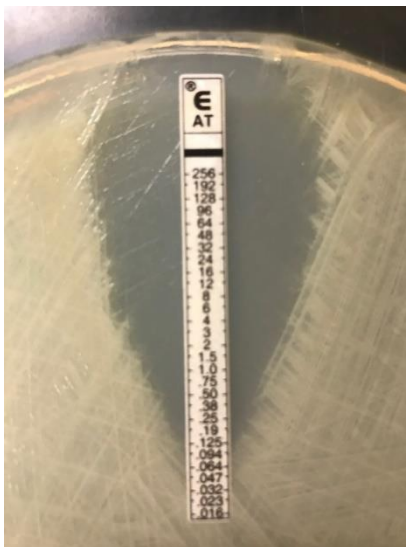


Read after 20 hours of  
incubation  
**MIC >32**

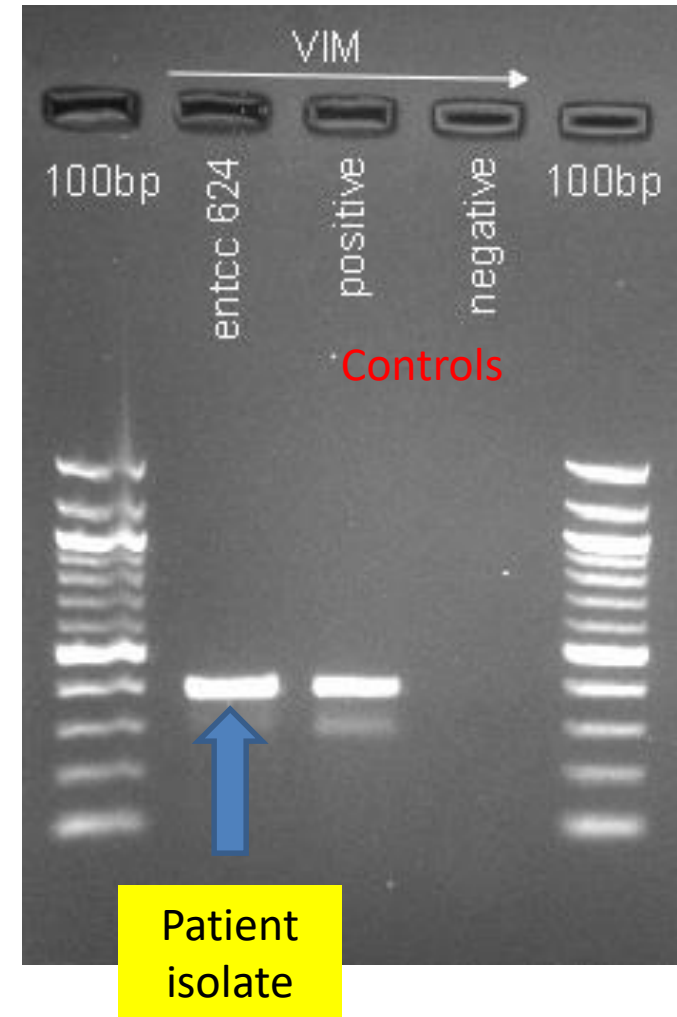
Note the inner zone

# So, what's the mechanism?

- **The organisms produces *bla*<sub>VIM</sub>**
- It does not harbor other enzymes KPC, NDM, or IMP
- The next question is if it also produces ESBL?
  - **Aztreonam** reported as resistant, but.....



Aztreonam MIC = 0.125 µg/mL



# What happened to this patient?

- 3/20: Admitted septic, blood cultures positive
  - Started vancomycin/pip-tazo
- 3/21: Switched to meropenem
- 3/25: Switched to ceftazidime/avibactam+ metronidazole (prior to AST)
- 3/26: Switched to meropenem/vaborbactam (after AST)
- 3/27: Transferred to SNF. Retrospectively SNF decided they could not afford mero/vabo. No antibiotic for 48 h
- 3/29: Aztreonam x 10 days
- No surgery!
- Currently at his chronic baseline