

06 – Antibacterial Drugs I: Key Points and Questions That Could be on the Exam

Speaker: Helen Boucher, MD

IDBR
INFECTIOUS DISEASE BOARD REVIEW
AUGUST 20-24
2022

**Antibacterial Drugs:
Key Points and Questions That Could Be On the Exam**

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Disclosures of Financial Relationships with Relevant Commercial Interests

- Editor
 - ID Clinics of North America
 - Antimicrobial Agents and Chemotherapy
 - Sanford Guide
- Voting Member, Presidential Advisory Council on Combating Antibiotic Resistant Bacteria (PACCARB)

Question 1 Updated 8-24-22 **PREVIEW QUESTION**

In *Staphylococcus aureus*, the protein encoded by the *mecA* gene is which of the following:

- A Leukocidin
- B PBP 2a
- C Oxacillinase
- D IL28 TT
- E ESBL

3

Question 2 Updated 8-24-22 **PREVIEW QUESTION**

Which of the following would be the best choice, among the drugs listed, to treat MSSA bacteremia

- A) Doripenem
- B) Imipenem
- C) Ceftriaxone
- D) Cefazolin
- E) Aztreonam

4

β -lactam Spectrum

- Penicillins
- Semi-synthetic penicillins
- 1st gen cephalosporins
- 2nd gen cephalosporins
- 3rd gen cephalosporins
- 4th gen cephalosporins
- Carbapenems
- Monobactams

Gram-positive

Gram-negative

5

Question 3

Which of the following has microbiologic and clinical activity against *Enterococcus faecalis*

- A) Cefazolin
- B) Ceftriaxone
- C) Imipenem
- D) Aztreonam
- E) Piperacillin-tazobactam

6

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Important Resistant Gram+ Organisms

- **Enterococcus**
 - Resistant: All cephalosporins and monobactams
- **MSSA**
 - Resistant: All penicillin and monobactams
 - Ceftriaxone does NOT work well
- **MRSA**
 - Resistant: All beta-lactams except ceftaroline

7

IV and Oral MRSA Drugs

IV <ul style="list-style-type: none"> • Vancomycin • Daptomycin • Linezolid/Tedizolid • Ceftaroline • Telavancin • Minocycline • Clindamycin • Dalbavancin/Oritavancin • Delafloxacin 	Oral <ul style="list-style-type: none"> • Linezolid/Tedizolid • TMP-SMX • Doxy/minocycline • Clindamycin • Delafloxacin
Combination Therapy <ul style="list-style-type: none"> – See Chambers lecture 	

8

Drug Regimens Active Against VRE (*E. faecium*) Resistant to Vancomycin and Ampicillin

- Linezolid (FDA approved)
- Daptomycin plus probably one of following
 - Ampicillin or ceftaroline or ceftriaxone
- Ampicillin if amp MIC ≤ 32 mcg/ml
- Ampicillin-sulbactam
 - if resistance due to beta lactamase production
- Not Quinupristin/dalfopristin-FDA approval withdrawn for VRE
- For cystitis (not pyelonephritis)
 - Nitrofurantoin
 - Fosfamycin

**E faecalis* resistant to vanco are often susceptible to ampicillin

9

Question 4

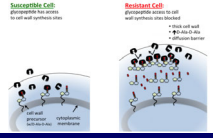
What is the mechanism of action for vancomycin resistance for *Staphylococcus aureus*

A) Mec A
 B) Efflux pump
 C) Change in vancomycin binding site on peptidoglycan
 D) Porin

10

Vancomycin Resistance

- **VISA**
 - Thick walls, generous binding sites...
- **Vancomycin resistance**
 - Not in *Streptococcus*
 - RARE in *Staphylococcus*
 - Common in *Enterococcus*
 - Rare in *E. faecalis* (4% in 2014)
 - Common in *E. faecium* (71% in 2014)
 - Mechanism
 - Change in vancomycin binding site on peptidoglycan



11

Question 5

Eosinophilic pneumonia is a complication of which of the following:

A) Ceftaroline
 B) Delafloxacin
 C) Doripenem
 D) Daptomycin
 E) Linezolid

12

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Question 6

Drug interference with clotting tests are most often a complication of which of the following

- A) Vancomycin
- B) Linezolid
- C) Dalbavancin
- D) Oritavancin
- E) Tedizolid

13

Question 7

- How common is vancomycin resistant *S. aureus* (VRSA) in the United States
- A) 20% isolates
- B) 10% isolates
- C) <5% isolates
- D) < 50 total isolates
- E) Zero

14

Question 8

- Which of the following glycopeptides has the best activity against *C. difficile*
- A) Dalbavancin
- B) Oritavancin
- C) Telavancin
- D) Vancomycin
- E) Teicoplanin

15

Question 9

Which of the following would be a bad choice to treat a urinary tract infection empirically

- A) Ciprofloxacin
- B) Levofloxacin
- C) Moxifloxacin
- D) Delafloxacin

16

Question 10

A 55 year old man undergoes emergency surgery for a ruptured appendix with severe bacterial peritonitis and septic shock.

He has no antibiotic allergy or intolerances.

Which one of the following antibiotics requires concomitant metronidazole IV?

- A Piperacillin-tazobactam
- B Ampicillin-sulbactam
- C Cefepime
- D Imipenem-cilastatin-relebactam
- E Eravacycline

17

Question 11

Which of the following drugs can cause hyperkalemia

- A) Linezolid
- B) Delafloxacin
- C) Trimethoprim
- D) Daptomycin
- E) Eravacycline

18

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TMP-SMX Adverse Effects

- Anaphylaxis
- Skin rashes
- Bone marrow toxicity
- Hemolysis (G6PD def)
- Hepatitis
- Gastrointestinal effects
- “Nephrotoxicity”
- Fever
- Drug-drug interactions
- Hyperkalemia

TMP COMPETES FOR
TUBULAR SECRETION

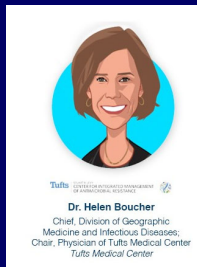
19

Good Luck!!

20

Questions, Comments?

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21