STUDY GUIDE

VANCOMYCIN AND THE GLYCOPEPTIDE ANTIBIOTICS

1. Briefly describe the history of vancomycin use and products from the time of its introduction to the present.

2. Why is vancomycin classified as a "glycopeptide"? How do the amino acids moieties found in this drug differ from those that comprise mammalian proteins?

3. What are the acid/base properties of vancomycin? Which salt form is commercially available and what is its solubility and stability profile?

4. How does teicoplanin differ in structure from vancomycin? Is it used in the US?

5. What is vancomycin's mechanism of action and which structural features are important determinants of activity? Is it bactericidal or static in action?

6. How does vancomycin compare to the beta-lactams in its mechanism of action? How does it compare in terms of general spectrum of activity (beta-lactamase-producing bacteria)? Does "cross-resistance" exist between vancomycin and the beta-lactams?

7. Which organisms are innately resistant to vancomycin?

8. Which organisms have acquired resistance and what are the mechanisms of resistance? What is "VRE"? List the major risk factors for acquisition of VRE.

9. Compare and contrast the three major phenotypes of VRE in terms of relative incidence, susceptibility to teicoplanin, the source and function of the resistance determinant, and the major organisms.

10. Using structures, explain the mechanism of VanA resistance.

11. Which organisms are sensitive to vancomycin? Which are resistant and why?

12. List the major therapeutic uses of vancomycin.

13. Describe the oral bioavailability profile of vancomycin including absorption, chemical hydrolysis and conditions which may result in enhanced absorption.

14. Is this agent used orally? If so, for which condition?

15. How is vancomycin administered to treat systemic infections? What precautions are necessary?
16. Describe the distribution profile (Vd, ppb, tissue levels) of vancomycin. How does vancomycin's structure influence distribution?

17. What is the clearance profile of vancomycin (metabolism and elimination)? What is the primary mechanism of elimination?

18. In which conditions is determination of vancomycin serum levels important? Why?

19. What are the primary adverse reactions of concern in patients treated with vancomycin? Why are currently available vancomycin preparations considered "safer" than those marketed in the 1960s?

20. Describe the characteristics of the "red neck" syndrome and thrombophlebitis. Under which infusions conditions are these syndromes most likely and what is the time course?

21. How can the frequency of red neck syndrome be minimized? How are the symptoms treated and why?

22. Characterize the ototoxicity associated with vancomycin use and identify the major risk factors. Which monitoring method(s) may be employed to minimize the risk of this adverse reaction?

23. When is vancomycin-associated nephrotoxicity most likely to occur? Which monitoring method(s) may be employed to minimize the risk of this adverse reaction?

24. What are the primary drug interactions of concern in patients receiving vancomycin?

25. What is the basis of drug interactions of vancomycin with heparin? What is the basis of IV solution incompatibilities between vancomycin and other drugs?