Example Cases at the end of the Aminoglycoside Monitoring Lecture given on 02/02/04

***NOTE: The discussion of these cases was meant to be dynamic, and the topics discussed may have varied depending on the direction of the dialogue. However, since Dr. Rotschafer was unable to cover these cases during his lecture, we will provide a general idea of points that you should be thinking about when evaluating cases such as these.

Example 1
- 40 y.o. female, 6’ tall and weight 75 kg is admitted for treatment of pyelonephritis
- pt. started on gentamicin 400 mg QD and ampicillin 500 mg Q6h
- cultures of blood and urine are pending
- pt. has no medical history of renal impairment or drug allergies
- pharmacy receives a pharmacokinetic consult, what should be done for this patient?

Discussion 1
- Calculate LBW (DBW if necessary)
  - Does the dosing regimen seem appropriate?
- Is this her first UTI? If so, then she is probably infected with a typical pathogen (e.g., *E. coli*) with typical MICs. If she suffers from recurrent UTIs, then she might have a pathogen with increased MICs (decreased susceptibility) to the commonly used agents.
- Is SDD appropriate? The answer to this partially depends on the answer to the question above.
- Do we really need a pharmacokinetic consult? In most cases, patients with UTIs will not spend much time, if any, in the hospital before they are discharged home with oral antibiotics. Thus, if the patient will be leaving within the next day or so, a PK study may not be necessary.

Example 2
- 50 y.o. male (6’ tall, weight 85 kg) admitted for elective abdominal surgery eight days ago spikes temperature; pt. has no allergies and the serum creatinine has been 1.2 mg/dl
- pt. is placed on ampicillin/sulbactam 3 gm q6h & gentamicin 140 mg q8h
- prior to the 4th gentamicin dose, the night RPh orders a trough and peak gentamicin level
- physician calls the DCP asking what should be done with the gentamicin dose

Discussion 2
- Calculate LBW (DBW if necessary), estimated CrCl, kd, and t1/2
  - Does the dosing regimen seem appropriate?
What kind of elective surgery did the patient have? The answer to this question would help determine if antibiotic prophylaxis is necessary at all, and if so, which antibiotics are most appropriate.

For the 4th dose, you would usually assume that the pt. is at steady state, but you need to confirm that the patient has received all of the scheduled doses on time, the patient status has remained stable, etc.

Since this is prophylaxis, do you need to do a PK study? If you don’t know what bug you are treating, how can you know what peaks and troughs are appropriate? The answer to these questions is debatable.

Example 3

- 24 y.o. male (5’10” tall, weighs 105 kg) involved in MVA suffers multiple injuries
- pt. is started on piperacillin/tazobactam 3.375 gm q6h & gentamicin 100 mg q12h
- pt. has positive blood & sputum cultures for \textit{P. aeruginosa}; serum creatinine is 1 mg/dl
- The physician contacts you wanting a PK study ASAP. You find out the last dose was just given 20 minutes ago and proceed to obtain two post infusion levels, how should these data be evaluated?

Discussion 3

- Check dose and interval appropriateness.
- Aggressive management is necessary because of the seriousness of the infection (\textit{P. aeruginosa} pneumonia).
  - Piperacillin alone (minus the tazobactam) could probably be used for pseudomonal coverage. The tazobactam doesn’t do much for the type of beta-lactamases that are produced by \textit{Pseudomonas}.
- What dose was the “last dose”? First? Second? Steady state? This needs to be determined to know what to do with the data.
- Do you want to use aminoglycosides in this patient? Since this is a lung infection, and aminoglycosides don’t penetrate lung tissue very well, you may want to consider switching to a fluoroquinolone.

Again, these discussions are meant to give you an idea of things you should be thinking about when evaluating patient data. However, these are not all-inclusive discussions.