

## Weekly Post-it: carboplatin maximum dose calculation

### Background:

- The Calvert equation is used to calculate Carboplatin dosages
  - Total dose (mg) = (Target AUC) x (GFR + 25)
- The clinical laboratory at OLOL and at other hospitals across the country use a technique to estimate the GFR that can underestimate SCr values when the SCr values are very low (e.g. 0.7mg/dL)
- Falsely low SCr values can cause overestimation of GFR in some patients with normal renal function.
- When falsely elevated GFR values are utilized to calculate a carboplatin dosage, greater than desired doses of carboplatin may be derived. This can increase the risk of drug-related toxicity.

### FDA recommendation:

- Physicians should consider capping the dose of carboplatin for desired exposure (AUC) to avoid potential toxicity due to overdosing.

### Dose capping guidelines:

- Target AUC = 6, the maximum dose is 6 x 150 = 900mg
- Target AUC = 5, the maximum dose is 5 x 150 = 750mg
- Target AUC = 4, the maximum dose is 4 x 150 = 600mg

Example 1: 54 year old male, 73kg, 5ft. 10in. (IBW=73kg), SCr 0.5mg/dL, Target AUC = 6	
<p><i>Incorrect calculation:</i></p> $\text{CrCl} = \frac{140 - \text{age} \times \text{weight (kg)}}{\text{SCr} \times 72} = 174 \text{ml/min}$ <p><i>Note: In the absence of renal impairment, GFR is normally 80-130mL/min</i></p> <p>Carboplatin dose = Target AUC x (GFR + 25) = <b>1196mg</b></p>	<p><i>Correct calculation:</i></p> $\text{CrCl} = \frac{140 - \text{age} \times \text{weight (kg)}}{\text{SCr} \times 72} = 174 \text{ml/min} = \mathbf{125 \text{mL/min (Capped)}}$ <p>Carboplatin dose = Target AUC x (GFR + 25) = <b>900mg</b></p>

### Procedure for order review & entry:

- Physicians must indicate the target AUC when carboplatin is ordered (*Note: carboplatin was previously dosed based on BSA, but this is no longer a standard practice*)
- We must call the physician and obtain the information if this is missing
- Compare the target AUC & the prescribed dose with the capping guidelines above to be sure the maximum dose has not been exceeded
- If it has, alert the physician and ask for an order clarification
- Document the intervention in Medkeeper

### References:

1. FDA/CDER resources page. Food and Drug Administration website. Available at: <http://www.fda.gov/AboutFDA/CentersOffices/CDER/ucm228974.htm>. Accessed October 22, 2010.
2. Calvert AH, Newell DR, Gumbrell LA, et al. Carboplatin dosage: prospective evaluation of a simple formula based on renal function. *J Clin Oncol*. 1989; 7: 1748-56.
3. Cockcroft DW, Gault MH. Prediction of creatinine clearance from serum creatinine. *Nephron* 1976; 16(1): 31-41.
4. Carboplatin [package insert]. Bedford, OH: Bedford Laboratories; 2004.

