Pharmacist Verification of Carboplatin AUC Dosing

Recommendations:

1. Continue using Cockcroft-Gault formula for estimation of CrCl for use in Calvert equation for calculating carboplatin AUC-based doses
2. Continue capping GFR in the Calvert formula at 125 mL/minute
    a. "The GFR used in the Calvert formula to calculate AUC dosing should not exceed 125 mL/min. The maximum carboplatin dose should not exceed AUC (mg X min/mL) X 150 mL/min." Griggs JJ, et al. Appropriate chemotherapy dosing for obese adult patients with cancer: American Society of Clinical Oncology Clinical Practice Guideline. *J Clin Oncol* 2012; 30(13):1553-61.
    b. NCI recommendation
3. Use actual body weight as the standard weight in the Cockcroft-Gault CrCl equation when calculating carboplatin doses using the Calvert formula
    a. Original equation validated using actual body weight. Cockcroft DW, et al. Prediction of creatinine clearance from serum creatinine. *Nephron* 16:31-41.
4. Round SCr up to a lower limit of 0.8 mg/dL
    a. Published SCr correction values range from 0.6 – 1 mg/dL. 0.8 mg/dL was selected to aid in greater precision and less bias as compared with actual serum creatinine levels. Herrington JD, et al. Prospective evaluation of carboplatin AUC dosing in patients with a BMI ≥27 or cachexia. *Cancer Chemother Pharmacol* 2006;57:241-7.
    b. NCI carboplatin letter October 2010: lower limit of SCr 0.6 mg/dL
    c. GOG Spring 2012 – lower limit of SCr 0.7 mg/dL for clinical trials
5. Pharmacist will clarify carboplatin dose with prescribing physician if ≥10% difference in final dose calculations
6. Pharmacist will enter i-Vent in Epic to reflect a second carboplatin calculation check by pharmacy for the following:
    a. The 'Order dose' does not equal the 'Formula dose' and/or an 'Order-specific SCr' was entered into the formula per manual adjustment by the provider.
    b. Any hand written carboplatin orders on paper (i.e. provider does not have Epic access)
7. An i-Vent is <u>not</u> required for carboplatin doses ordered via a Beacon treatment plan and meet all of the following criteria:
    a. 'Order dose' equals 'Formula dose'
    b. The CrCl formula used is the 'Cockcroft-Gault (SCr Rounded)'
    c. An appropriate Target AUC per protocol is selected
    d. No 'Order-specific SCr' entered i.e. SCr resulted within 48 hours is used

Examples of carboplatin dose variation:

Patient A: 56 year-old female, 170 cm, 73 kg, SCr 0.8 mg/dL, AUC 5, IBW 61 kg

	CrCl (mL/min)	Carboplatin dose
Actual weight (73 kg)	**90**	**575 mg**
IBW (61 kg)	76	505 mg

Patient B: 78 year-old female, 157 cm, 49 kg, SCr 0.5 mg/dL, AUC 5, IBW = 50 kg

	CrCl (mL/min)	Carboplatin dose
SCr 0.5 mg/dL	72	485 mg
Adjusted SCr 0.8 mg/dL	**45**	**350 mg**

Patient C: 25 year-old female, 172 cm, 87 kg, SCr 1 mg/dL, AUC 5, IBW 63 kg (87 kg is 138% of IBW)

BMI 27.6

	CrCl (mL/min)	Carboplatin dose
Actual weight 87 kg	**118**	**715 mg**
Adjusted weight 70 kg	95	600 mg
IBW 63 kg	86	555 mg

Equations

- Cockcroft Gault: CrCl (mL/min) = [(140- age) X weight] / (SCr X 72) Multiple X 0.85 if female
- Calvert formula: Total CARBOplatin dose (mg) = (target AUC) X (GFR + 25)
- Ideal body weight (kg):

  Male: 50 kg + 2.3 X inches over 5 ft) Female: 45.5 kg + (2.3 X inches over 5 ft)

- Adjusted body weight (Adj BW) = IBW + 30% (actual BW – IBW) = kg