I. **PURPOSE:**
To allow standardized pharmacist management of IV vancomycin in the inpatient setting using evidence-based guidelines and best practices.

II. **POLICY:**
A. Upon physician request, SHC pharmacists will manage IV vancomycin therapy in accordance with evidence-based guidelines and best practice standards.
   1. Adjust vancomycin orders
   2. Order pertinent labs (e.g. vancomycin levels, SCr)
   3. Provide documentation via progress notes and Epic flowsheet
B. Protocol exclusions:
   1. One-time dose
   2. Anticipated duration < 2-3 days (e.g. surgical/peri-operative prophylaxis)
   3. Pediatric patients (<18 years of age)

III. **PROCEDURE:**
A. Physician/Ordering Provider Responsibility
   1. Indicate that a patient is to receive vancomycin according to this protocol by entering an order for “Vancomycin per Protocol” and specifying the following:
      a. Initial indication: Prophylaxis, empiric, definitive
      b. Suspected infection type
      c. Anticipated duration of therapy
   2. Continue to follow vancomycin levels and consult with pharmacist as needed
   3. Notify the pharmacist of acute changes in patient’s status that may impact vancomycin dosing (e.g. changes in renal function, urine output).
   4. Ordering providers may discontinue and/or reinitiate the protocol at any time.
      a. If the protocol is discontinued, the provider assumes responsibility for vancomycin therapy management
   5. Notify the pharmacist of acute changes in patient’s status that may impact vancomycin dosing (e.g. changes in renal function or urine output).
   6. The physician may discontinue and/or reinitiate the protocol at any time.
a. If the protocol is discontinued, the physician assumes responsibility for vancomycin therapy management

B. Pharmacist Responsibility (contents of this section appears in other parts of the document- consider limiting it to strictly procedural responsibilities vs. clinical assessment?)

1. Upon receipt of a “Vancomycin per Protocol” order, review the patient’s chart to ensure the appropriate use of vancomycin.
   a. Clarify indication if not provided and/or not clear in medical chart
   b. Recommend alternative therapy if vancomycin use is inappropriate or contraindicated

2. Obtain relevant parameters for appropriate dosing [Refer to SHC Vancomycin Dosing Guide - Section A]

3. Enter necessary lab and medication orders for vancomycin therapy.
   a. Sign all orders as “Per Protocol without co-sign” with the ordering pharmacist’s name.
   b. Check SCr at baseline and as needed (at least every 3 days).
      Correlate vancomycin levels with SCr trends and monitor changes in renal function.
   c. For difficult sticks, refer to Nursing policy “Antibiotic Pre and Post Levels”

4. Documentation
   a. Fill out pharmacy flowsheet PRN handoff updates and AUC results
   b. Enter a daily Pharmacy Progress Note using the Pharmacy Monitoring note template (“vancomycin”)

IV. DOsing & Monitoring Guidelines
   A. Initial Dosing
      1. Review the following prior to initiation of therapy:
         a. Indication, relevant and pending microbial culture(s)
         b. Age, gender, height, weight, BMI
         c. Renal replacement therapy
         d. Special populations (obese, elderly, severely malnourished [BMI<16], amputees, pregnancy)
         e. Prior vancomycin dosing history (if applicable)
         f. Potential drug interactions
g. Serum creatinine (SCr), urine output (if available), creatinine clearance (CrCl)
   i. Calculate CrCl using the Cockcroft-Gault equation (Figure 1)
      a) Elderly or severely malnourished: rounding SCr up is associated with underestimation of CrCl- clinical discretion advised [Smythe 1994, Young 2017, Barber 2016, Winter 2012]
      b) Use ideal body weight (IBW) for non-obese patients
      c) Use adjusted body weight (ABW) for obese patients [BMI ≥30 kg/m²]
      d) Use total body weight (TBW) if TBW < IBW

**Figure 1. Cockcroft-Gault Equation**

\[
CrCl \left( \frac{ml}{min} \right) = \frac{(140 - \text{age}) \times \text{IBW} (x 0.85 f or females)}{\text{SCr} \times 72}
\]

   IBW (male) = 50 kg + (2.3 x height in inches > 60 inches)
   IBW (female) = 45 kg + (2.3 x height inches > 60 inches)
   ABW (kg) = IBW + 0.4 (TBW − IBW)

h. Adverse Effects
   i. Red Man Syndrome is characterized by hypotension and/or a maculopapular rash appearing on the face, neck, trunk, and/or upper extremities. If this occurs, pharmacist may slow the infusion rate (e.g. to 90-120 mins per 1 gm.) ± increase the dilution volume upon provider request ± recommend diphenhydramine 25-50mg premedication to the provider

2. Pharmacist will follow the **SHC Vancomycin Dosing Guide** in conjunction with clinical discretion to optimize dosing and minimize toxicity.

B. Dose revisions
   a. Pharmacist will follow the **SHC Vancomycin Dosing Guide** in conjunction with clinical discretion to optimize dosing and minimize toxicity.

V. **COMPLIANCE:**
A. All workforce members including employees, contracted staff, students, volunteers, credentialed medical staff, and individuals representing or engaging in the practice at SHC are responsible for ensuring that individuals comply with this policy;

B. Violations of this policy will be reported to the Department Manager and any other appropriate Department as determined by the Department Manager or in accordance with hospital policy. Violations will be investigated to determine the nature, extent, and potential risk to the hospital. Workforce members who violate this policy will be subject to the appropriate disciplinary action up to and including termination.

VI. RELATED DOCUMENTS / PROCEDURES:
A. Vancomycin Dosing Protocol
B. Vancomycin AUC Excel calculator

VII. DOCUMENT INFORMATION:
A. Legal References / Regulatory Requirements:


11. Winter, Michael E., Basic Clinical Pharmacokinetics, 5th ed, Lippincott Williams & Wilkins


Obesity references:


B. Original Document:
1. Owner: SASS team
2. Author and date: Emily Mui, Pharm.D. BCPS: 08/2013

C. Distribution and Training Requirements:
1. New documents or any revised documents will be distributed to Department Manual holders. The department/unit/clinic manager will be responsible for communicating this information to the applicable workforce members.
D. Review and Renewal Requirements:
   1. This policy will be reviewed and/or revised every three years or as required by change of law or practice.

E. Review and Revision History:
   1. Lina Meng, Pharm.D., BCPS, BCCCP: 06/2015, 08/2016, 10/2016, 4/2018
   2. Emily Mui, Pharm.D., BCPS: 08/2016, 4/2018

F. Approvals:
   1. Antibiotic Subcommittee: 08/2013, 5/2018
   2. Pharmacy and Therapeutics Committee: 11/2015, 03/2016, 9/2016, 6/2018

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