Nebulized Vancomycin

Indications for Use of this Medicine
Vancomycin is an antibiotic used to treat upper and lower respiratory infections caused by several types of bacteria such as *Staphylococcal (Staph)* or *Streptococcal (Strep)*. Antibiotic medicines kill the bacteria by preventing its growth.

Dose for Nebulized Vancomycin
250 mg vancomycin (5 mL from diluted vancomycin vials) twice daily by nebulization.

Supplies Needed for One Month of Treatment (250 mg twice daily for one month)

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vancomycin 500 mg vials</td>
<td>30 vials</td>
</tr>
<tr>
<td>Sterile water for injection 10 mL vials</td>
<td>300 mL (30 vials x 10 mL)</td>
</tr>
<tr>
<td>Sodium chloride inhalation solution 0.9% 5mL</td>
<td>300 mL (60 vials x 5 mL)</td>
</tr>
<tr>
<td>10 mL Syringes</td>
<td>30 syringes</td>
</tr>
<tr>
<td>5 mL Syringes</td>
<td>60 syringes</td>
</tr>
<tr>
<td>Mini-Spike Dispensing Pins</td>
<td>60 Dispensing Pins</td>
</tr>
<tr>
<td>Alcohol wipes</td>
<td>1 box (100/box)</td>
</tr>
</tbody>
</table>

How to Prepare the Vancomycin for Nebulization
Vancomycin comes as a powder in 500 mg vials and must be diluted before using. Dilute a new vial of vancomycin each morning, and store it in the refrigerator between uses. Use a new 10 mL syringe every day to dilute the vancomycin. Use a new 5 mL syringe for each nebulization. The Mini-Spike Dispensing Pin can remain in the vial until the vial is empty or is discarded.

Preparation:
1. Prepare a clean area for mixing vancomycin for nebulization.
2. Wash your hands.
3. Uncap the plastic covers from the sterile water and the vancomycin vials.
4. Wipe off the top of the sterile water and the vancomycin vials with an alcohol wipe.
5. Open the packages of the Mini-Spike Dispensing Pins: one for the vancomycin vial and one for the sterile water vial. The Mini-Spike Dispensing Pins are designed to allow the addition or removal of liquid without the use of a needle.

Reconstitution (mixing) of Vancomycin:
1. Pick up the Mini-Spike Dispensing Pin (or “Dispensing Pin”) using the tab and uncap the clear plastic cap covering the spike. Do not touch the pointed end of the spike. If you touch the pointed end of the Mini-Spike Dispensing Pin, throw it away and open a new package.
- Using one Dispensing Pin, insert the pointed end into the top of the vancomycin vial through the rubber stopper.
- Using the other Dispensing Pin, insert the pointed end into one sterile water vial through the rubber stopper.
- Remove the blue twist caps from the top of the Dispensing Pins, taking care not to touch the top of the Dispensing Pins. Place the blue twist caps on a clean paper towel with the bottom of the blue twist cap facing upwards.

2. Open up the package for one 10 mL syringe. Pick up the 10 mL syringe by the barrel (do not touch the tip of the syringe). Screw the 10 mL syringe to the Dispensing Pin on the sterile water vial, then invert the vial and pull back on the syringe to draw up 10 mL of sterile water.

3. Unscrew the syringe from the sterile water vial and discard the empty vial. The sterile water vial cannot be saved for reuse even if there is water left in the vial since it has no preservative to prevent bacterial growth.

4. Screw the syringe containing 10 mL of sterile water into the Dispensing Pin attached to the vancomycin vial, and then inject the sterile water into the vial. Discard the 10 mL syringe.

5. Replace the blue twist cap on the vancomycin vial and swirl gently to mix. Do not shake the vial as this may cause the medicine to foam.

**Measuring the Correct Dose of Vancomycin for Nebulization:**

1. Each vial of reconstituted (mixed) vancomycin contains 500 mg of drug in a 10 mL volume.
   - A 250 mg dose is 5 mL of solution (one vial provides two doses)

2. Using a 5 mL syringe, screw the syringe into the Dispensing Pin in the prepared vancomycin vial. Draw up 5 mL of the prepared vancomycin (250 mg) mixture. Unscrew the syringe and put this mixture into the nebulizer cup. Discard the 5 mL syringe.

This vancomycin mixture needs to be further diluted before nebulizing. Sodium chloride inhalation solution 0.9% is used for this purpose.

**Diluting the Vancomycin with Sodium Chloride Inhalation Solution 0.9% in the Nebulizer Cup:**

Add 5 mL of sodium chloride inhalation solution 0.9% to the nebulizer cup containing the vancomycin mixture. Swirl to mix. Adding sodium chloride solution 0.9% to the vancomycin in the nebulizer cup makes it easier to nebulize vancomycin without coughing.

- If you add more of the sodium chloride solution 0.9% to the cup, this will not affect the vancomycin treatment. Adding more will only increase the length of time needed to nebulize the medication.
- Use a separate sodium chloride 0.9% vial for each nebulized treatment. The vial is designed for single use only and must be discarded after a single use.

**How to Nebulize the Vancomycin**

1. Before inhaling vancomycin, 1st inhale a medication to open up your lungs as directed by your healthcare provider (for example, could inhale 2 puffs from an albuterol inhaler).
2. Attach one end of the smooth tubing to the air compressor and the opposite end to the nebulizer. Turn the air compressor on. A fine mist should be visible. If not, make sure the compressor is working by disconnecting the smooth tubing. Feel for air coming from the compressor. If the compressor isn’t working properly, check all connections. If the nebulizer is still not misting, use a different nebulizer kit.
3. Place the mouthpiece in your mouth. Small children may use a mask over the mouth and nose rather than a mouthpiece.

4. Take slow, deep, even breaths through your mouth. Make sure the medicine cup is kept upright.

5. Continue the treatment until the medicine is finished (no mist comes out). Remember to hold the cup upright so that the medicine does not spill. If the medicine sticks to the side of the cup, gently tap the sides of the cup.

6. Foam may develop in the medicine cup during nebulization. This is a normal reaction of the drug.

7. After the treatment is over, it is very important to take the medicine cup apart, rinse with hot water, and allow it to air dry on paper towel.

Storage
Store the sterile water and undiluted vancomycin vials (powder) at room temperature until use. Store the reconstituted (mixed) vancomycin vials in the refrigerator for no longer than 24 hours. Once vancomycin is prepared, it must be either used immediately or stored in the refrigerator for use within 24 hours. If mixed and not used the same day, it must be thrown away.

How often are treatments done?
Treatments are generally scheduled twice daily. If you use a bronchodilator inhaler, use it before you do the therapy. Your symptoms should improve or remain stable as you continue the therapy. If your infection does not improve or if it gets worse, call your doctor.

Side Effects
When inhaled, vancomycin may lead to difficulty in breathing, wheezing, coughing, and shortness of breath. If these occur, please tell your doctor or respiratory therapist promptly. Call your doctor right away if you notice any symptoms of an allergic reaction including itching or hives, swelling in your face or hands, swelling or tingling in your mouth or throat, chest tightness, and/or trouble breathing.

How to Clean and Disinfect the Small Volume Nebulizer by Heat
Note: Use the following heat methods only for sturdy, hard plastic nebulizer cups. Heat cleaning may melt lighter, clear plastic nebulizers.

All of your nebulizer parts can be cleaned and disinfected in your dishwasher or microwave twice a week except for the blue reservoir tubing. The blue tubing cannot be placed in the dishwasher. This piece needs to be cleaned according to the “by hand” instructions below.

Dishwasher:
1. Take the nebulizer apart.
2. Place the pieces in a dishwasher basket on the top rack of the dishwasher.
3. After the dishwasher cycle is done, remove the pieces and shake out the extra water.
4. Air-dry the nebulizer pieces on a dry paper towel.

Microwave:
1. Take the nebulizer apart. Wash the pieces in warm soapy water.
2. Rinse with hot water.
3. Place the nebulizer pieces in a bowl. Add enough water to completely cover the pieces.
4. Microwave for 3-5 minutes; shorter time in high power microwaves to keep the nebulizer from melting.
5. Place the nebulizer pieces on a paper towel to dry.

**How to Clean and Disinfect the Small Volume Nebulizer by Hand**
If you would prefer not to clean and disinfect your nebulizer using the dishwasher, follow the steps below. To clean and disinfect by hand, you can use either the vinegar and water method or rubbing alcohol method. If you have Cystic Fibrosis (CF) do not use the vinegar and water method.

**Vinegar and Water Method:**
1. Take the nebulizer apart. Wash the pieces in warm soap water.
2. Rinse with hot tap water.
3. Place the nebulizer pieces in a bowl and add enough vinegar and water solutions to completely cover the equipment. To make the vinegar and water solution, mix 1 part White vinegar (5% solution from your grocery store) to 2 parts water (1 cup vinegar to 2 cups water).
4. Soak the nebulizer for 30 minutes to 2 hours.
5. Rinse all other parts of the nebulizer with sterile water. Do not use water from the faucet, bottled or distilled water; it could be contaminated. You can make water sterile by boiling it for 5 minutes. Use this water once, and then throw it out.
6. Place the pieces on a paper towel to dry.

**Rubbing Alcohol Method:**
1. Take the nebulizer apart. Wash the pieces in warm soapy water.
2. Rinse with hot tap water.
3. Place the nebulizer pieces in a bowl and add enough rubbing alcohol (isopropyl alcohol) to completely cover the nebulizer pieces.
4. Soak the nebulizer pieces for 5 minutes.
5. Rinse the nebulizer pieces with sterile water. Do not use water from the faucet, bottled, or distilled water. You can make water sterile by boiling it for 5 minutes. Use this water once, and then throw it out.
6. Place the nebulizer pieces on a paper towel to dry.

**Equipment**
If you have questions or need supplies, contact UW Home Health at (608) 203-2273.