

National Institutes of Health  
Warren Grant Magnuson Clinical Center  
Nursing Department

PROCEDURE: Backflow Technique for Administration of Secondary Intravenous (IV) Solutions

Approved:

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**PROCEDURE: Backflow Technique for Administration of Secondary Intravenous (IV) Solutions**

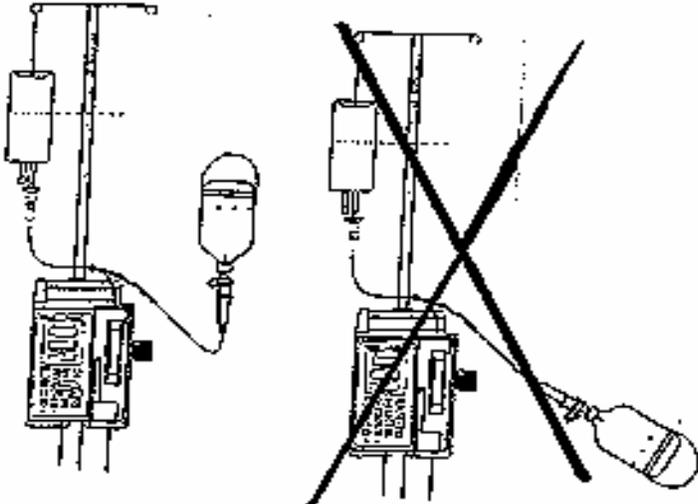
**A. Essential Information**

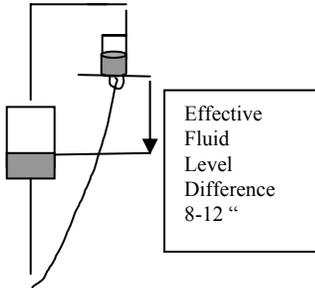
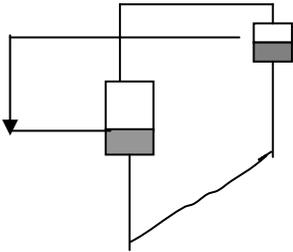
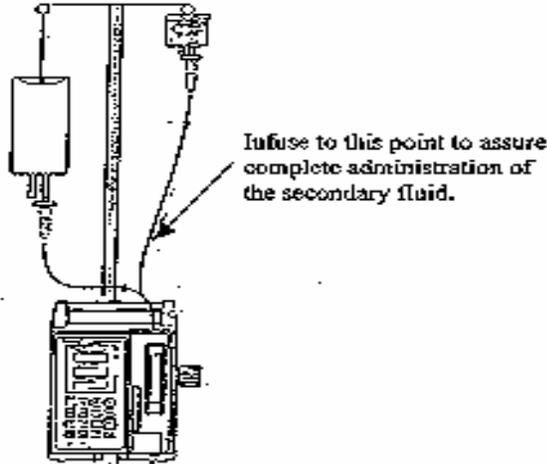
1. Secondary infusions (piggybacks) including cytotoxic agents will be administered by backflow technique.
2. Verify that primary and secondary IV solutions are compatible. Primary IV solutions containing additives may be used as the primary flush solution if they are compatible with the non-cytotoxic secondary solution (example: electrolytes compatible with certain antibiotics).
3. The vent on the IV tubing should be closed for plastic secondary containers and left open for glass secondary containers.
4. When administering piggyback **cytotoxic agents**, use a primary IV solution without additives as the flush solution. The process of priming tubing to dispel air generates waste and aerosol. Using a non-cytotoxic solution to prime tubing decreases risks of exposure of hazardous drugs (HD) and amounts of HD needing disposal.

**B. Equipment List**

- IV compatible primary flush solution
- Primary IV tubing
- Alcohol prep pads
- IV Pump (if appropriate)
- Secondary IV tubing:
  - For plastic containers- use universal tubing with vent cap shut or non-vented IV tubing
  - For glass containers- use vented or universal tubing with vent cap in the open position
- Secondary IV container

**C. Steps for Hanging Secondary Solutions**

STEPS	KEY POINTS
1. Clamp the secondary tubing and spike the secondary container.	1. For glass containers, leave the vent cap opened (comes from manufacturer in the open position). When spiking IV tubing into a glass container, hold the tubing spike so that the vent cap is vertical and upright and does not become wet. Once the vent cap becomes wet it may not allow air to flow through it and the infusion may stop.
2. Cleanse the primary tubing injection port above the pump with alcohol and connect the secondary IV tubing to the primary tubing.	
3. Lower the secondary container keeping the drip chamber and filter of the secondary tubing set vertical and upright then release the clamp on the secondary tubing	 <p>3. When lowering the secondary tubing and glass secondary bottle, keep the drip chamber vertical so that the vent cap does not become wet.</p>
4. Fill the secondary IV tubing and 1/2 of the drip chamber with flush solution.	

<p>5. Hang the secondary container and tubing so that the fluid level of the secondary container is about 8-12" above the fluid level of the primary IV container.</p> <p>5A. For plastic IV containers, the fluid level of the secondary IV container must be 8-12" above the fluid level in the primary bag.</p> <p>5B. For glass IV containers, the fluid level of the secondary container at the top of the drip chamber must be 8-12" above the fluid level in the primary bag.</p>	<p>5. GLASS</p>	<p>NON-GLASS</p>
	<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> <p>5B</p>  </div> <div style="text-align: center;"> <p>5A</p>  </div> </div>	
<p>6. Set the rate and volume for the secondary infusion.</p>		
<p>7. Administer the secondary infusion until the fluid level in the secondary tubing is only about 2 inches from where the secondary tubing connects to the primary tubing.</p>		
<p>8. Lower the empty secondary bag or glass bottle and tubing keeping the drip chamber and vent cap (if present) vertical and upright, and release the clamp on the secondary tubing.</p>	<p>8. Biomedical research may dictate variation in remaining steps (example: some pharmacokinetic studies).</p>	
<p>9. Backflow or fill the secondary tubing, drip chamber, and secondary container with about 20 ml of flush solution. Squeeze out excess from drip chamber before removing bag.</p>		
<p>10. Clamp the secondary tubing and remove the secondary container.</p>	<p>10. Position the secondary container so that fluids will not leak out when disconnecting from the tubing.</p>	
<p>11. Spike the new secondary container and squeeze the drip chamber to observe for any precipitant. If precipitation occurs, replace the secondary tubing and repeat the procedure from #1.</p>		
<p>12. Release the clamp on the secondary IV tubing and set the rate and volume for the secondary infusion.</p>		

13. Document infusions.	