

Recommendations from AABB's Clinical Transfusion Medicine Committee on Sterile Saline Shortage (0.9% NaCl Solution)

Background: It is standard practice at many hospitals to follow blood component transfusions with a normal saline (0.9% NaCl) flush. This serves the dual purpose of administering to the patient any residual blood left in the administration set (up to 40 mL), and it flushes the line for later use. The current shortage of saline bags (secondary to damage at the Baxter facility in Puerto Rico during hurricane Maria) has affected this practice in many hospitals and patient care settings.

For blood administration, the *Technical Manual* (19th edition) states that "...[T]he tubing can be primed with either 0.9% sodium chloride or the component itself." It further suggests that "tubing should be flushed with 0.9% sodium chloride solution before or after transfusion if it is used for other medications." The volume of saline needed to flush the line may be 30-50 mL (or roughly 10% of infused blood product) and is typically completed by using a 50-mL, 100-mL or 250-mL saline bag.

Standard 5.28.9 in the 31st edition of *Standards for Blood Banks and Transfusion Services*, titled "Addition of Drugs and Solutions," allows for exceptions to standard practice with blood administration when "there is documentation available to show that the addition is safe and does not adversely affect the blood or component."

Suggested Practice: To flush a line following a blood transfusion, several alternative options may be considered until the saline shortage resolves. The transfusion service medical director should determine the best alternative(s) for each institution.

1. Use a prepackaged 10-mL saline syringe to flush the line. Saline syringes are not in short supply. The syringe can be attached to the line via a Luer lock connection.

The use of straight tubing should also be considered instead of a Y-connector. When a Y-shaped connector is used, the second arm of the Y is usually attached to a bag of saline. Because the saline bag will not be used, this second arm should be clamped before transfusing blood if a Y-connector is used. This will prevent retrograde flow into the open arm of the Y, which could lead to contamination.

2. Review information [posted](#) by FDA on their "Drug Shortages" page. The document titled "[Small-Volume Parenteral Solutions Shortages: Suggestions for Management and Conservation](#)" advises the use of large-volume saline bags (250 mL or greater), which are not affected by the shortage. Ending the saline flush before the entire bag is infused should be considered if the patient cannot process excess volume.
3. Omit the flush entirely. The blood bank should make an allowance for the blood left in the tubing so that the patient receives the intended volume.
4. Allow the tubing to be "pumped to air" so long as there is a mechanism (air sensor) to detect when the line is empty.
5. The FDA has allowed Baxter to import saline from outside the United States. This link contains more information:

<https://www.fda.gov/downloads/drugs/drugsafety/drugshortages/ucm579560.pdf>

6. Acceptable alternatives to 0.9% sodium chloride include the following:
 - Calcium -free, isotonic, electrolyte solutions
 - 5% albumin
 - Normosol-R pH 7.4 (Hospira, Lake Forest, IL)
 - Plasma-Lyte A injection pH 7.4 (Baxter Healthcare, Deerfield, IL)
 - Plasma-Lyte 148 Injection, Multiple Electrolytes Injection, Type 1, USP (Baxter Healthcare)
 - Isolyte S (B Braun Medical, Bethlehem, PA)

Before selecting any alternative product(s), a review of the package insert should be performed.

NOTE: Solutions that must not be administered with blood components include:

- Solutions containing dextrose
- Lactated Ringer's solution or other solutions containing high levels of calcium.

Individuals who wish to monitor the progress for resolution of shortages should be advised that FDA maintains a list to show [Current and Resolved Drug Shortages and Discontinuations Reported to FDA](#). This list should be updated when the [Sodium Chloride 0.9% Injection Bags](#) is no longer considered to be currently in shortage.

References:

- Jorgenson M. Administration of blood components. In: Fung MK, Eder AF, Spitalnik S, Westhoff CM, eds. Technical manual, 19th edition. Bethesda, MD: AABB, 2017:489-503.
- Ooley P, ed. Standards for blood banks and transfusion services, 31st edition. Bethesda, MD: AABB, 2018:46.