Complications of and Contraindications to Perioperative Autotransfusion

AABB Guidelines for Blood Recovery and Reinfusion in Surgery and Trauma

Many contraindications are relative and the risk/benefit factor must be determined for each patient. **The decision to use peri operative autotransfusion is the responsibility of the surgeon in charge.** Refer to ***Table*** **2** for specific substances and their effects.

Table 2: *Complications of and Contraindications to Perioperative Blood Recovery**

Substance	Effects	Recommended Action
Pharmacologic Agents		
A. Clotting Agents		
1. Microfibrillar Products Examples: Avltene", Helitene® Oxycel", Gelfoarn"' Powder, tnstat" MCH	May cause platelet aggregation and clot formation. Reported to pass through a microaggregate filter into the blood stream, causing emboli.	Avoid aspiration when product is being used. Resumption is an option after copious irrigation with 0.9% sodium chloride solution to an alternate suction source.
2. Sponge/Fabric Materials Examples: Surgicel™, Surqicel" NuKnit®, Gelfoam® Sponge, Helistat"', lnstatt", Hernopad", Supe·r Stat®, Hemofom	Activates clotting sequence by acting as a contact agent. May clot off system.	Avoid aspiration in area where product is being used. Resumption is an option after copious irrigation with 0.9% sodium chloride solution to an alternate suction source.
3. Topical Liquids Examples: Thrombin-JMI, Thrornbostat", Thrornboqen"	Creates a fibrin clot by direct action on fibrinogen. May clot off system.	Avoid aspiration in area where product is being used. Resumption is an option after copious irrigation with 0.9% sodium chloride solution to an alternate suction source.
B. Irrigating Solutions		
1. Alcohol	Causes red cell lysis.	Avoid aspiration in area where product is being used. Resumption is an option after copious irrigation with 0.9% sodium chloride solution to an alternate suction source.
2. Antibiotics Examples: Bacitracin, Neomycin, Polyrnyxin	Can result in renal and neural toxicity if blood is not washed.	Increase amount of wash volume by 500 mL.
3. Betadine	Causes red cell lysis.	Avoid aspiration in area where product is being used. Resumption is an option after copious irrigation with 0.9% sodium chloride solution to an alternate suction source.

Substance	Effects	Recommended Action
4. Chloropactin (Bleach)	Causes red cell lysis.	Avoid aspiration in area where product is being used. Resumption is an option after copious irrigation with 0.9% sodium chloride solution to an alternate suction source.
5. Hydrogen Peroxide	Causes red cell lysis.	Avoid aspiration in area where product is being used. Resumption is an option after copious irrigation with 0.9% sodium chloride solution to an alternate suction source.
6. Hypertonic Solution Examples: 3% NaCl, 7.5% NaCl, Dextrose solutions	Causes red cell crenation.	Avoid aspiration in area where product is being used. Resumption is an option after copious irrigation with 0.9% sodium chloride solution to an alternate suction source.
7. Hypotonic Solution Examples: Sterile water, glycine	Causes red cell lysis.	Avoid aspiration in area where product is being used. Resumption is an option after copious irrigation with 0.9% sodium chloride solution to an alternate suction source.
8. Lactated Ringers (in presence of citrate anticoagulant)* *Not an issue if heparin is the anticoagulant used (AABB guidelines)	Calcium present may bind with citrate, activating coagulation sequence.	Avoid aspiration in area where product is being used. Resumption is an option after copious irrigation with 0.9% sodium chloride solution to an alternate suction source.
C. Methylmethacrylate		
1. Liquid or Powder Form	May cause circulatory collapse.	Avoid aspiration in area where product is being used. Resumption is an option after copious irrigation with 0.9% sodium chloride solution to an alternate suction source.
2. Hardened Form	May cause clogging of the system.	Avoid aspiration in area where product is being used. Flush suction line occasionally with anticoagulant or normal saline to keep clear.
II. Contaminants		
A. Amniotic Fluid	Contains proteolytic enzymes that may activate clotting.	Avoid aspiration in area where amniotic fluid is present. Blood recovery is an option after delivery of the fetus, removal of the amniotic fluid, and copious irrigation with 0.9% sodium chloride solution to an alternate suction source.
B. Bone Chips/Bone Grafting Materials	May cause clogging of the system.	Flush suction line occasionally with anticoagulant solution or normal saline to keep clear.
C. Bowel Contents	Potential for bacteremia.	Do not aspirate into system. Resumption is an option after copious irrigation with 0.9% sodium chloride solution to an alternate suction source.

Substance	Effects	Recommended Action
D. Fat	May not wash out completely.	Retain visible fat layer in reservoir and reinfusion bag. Increase wash volume to 2000 mL. If visible fat layer exists in reinfusion bag, piggyback two microaggregate filters between reinfusion bag and transfer pack or infusion set. Use lipid filter.
E. Gastric and Pancreatic	Fluid Proteolytic enzyme may cause red cell lysis.	Do not aspirate into system. Resumption is an option after copious irrigation with 0.9% sodium chloride solution to an alternate suction source.
F. Infection at Site of Aspiration	Potential for bacteremia.	Avoid aspiration in the presence of purulent material.
G. Skin Lesions (Infectious)	Incising a lesion may introduce organisms.	Blood recovery may be used if incision is not through a lesion.
H. Urine	Potential for bacteremia if urinary tract infection is present.	Avoid aspiration into system in the presence of a urinary tract infection.
I. Mucous Membrane Procedures Examples: Oral, nasal, vaginal	Potential for bacteremia, due to normal resident bacteria.	Medical risks and benefits should be discussed between the surgeon and the medical director of the ATS AABB Guidelines Program.
III. Malignancy		
A. Primary at Operative Site	Cell salvage is widely used in surgical excision of malignant tumors. The available data tends to indicate that the procedure is safe and does not increase the incidence of metastatic disease. However, because a control trial has not been performed (and it is questionable whether it will ever be performed), the decision to use cell salvage in malignancies must be left to the discretion of the surgeon.	Avoid blood recovery at tumor site. - AABB Medical risks and benefits should be discussed between the surgeon and the medical director of the ATS AABB Guidelines Program Consider the use of a leukoreduction filter.
B. Metastatic at Operative Site	Potential for further spread of disease.	Disease already systemic. Use at discretion of surgeon.
C. Pheochromocytoma	Potential for marked hypertension due to high concentrations of catecholamines.	Avoid aspirating at the tumor site. Resumption is an option after copious irrigation with 0.9% sodium chloride solution to an alternate suction source.
D. Ascites	Tumor cells may be present.	Avoid aspirating into the system if the surgical procedure is for ovarian malignancy .
IV. Hematologic Disorders		
A. Sickle Cell Trait	Wash procedure produces potential sickling of salvaged cells.	Alert staff of potential for red cell sickling.
B. Confirmed Sickle Cell Anemia	Wash procedure produces potential sickling of salvaged cells.	Medical risks and benefits should be discussed between the surgeon and the medical director of the ATS.

Substance	Effects	Recommended Actions
C. Cold Agglutinin Antibody	Agglutination of red cells may occur at temperatures lower than *37C* (98.6°F). Cold agglutinins are in plasma and will be off.	If cold agglutinins show significant activity at room temperature recommend transfusion of blood through a blood warmer
V. Miscellaneous		
A. Titanium Alloy Prosthesis	Effect of darkened tissue or clots (blue/green/black) surrounding prosthesis unknown to systemic circulation.	Discontinue cell salvage until the prosthesis and all darkened tissue have been removed. Resume after the wound has been irrigated with 0.9% sodium chloride solution to an alternative suction source
B. Liposuction	Fat concentration in salvaged blood may be too high to remove by washing.	Avoid blood recovery

*1997 AABB Guidelines for Blood Recovery and Reinfusion in Surgery