

CONTRAINDICATIONS TO ICS

AREA OF APPLICATION

The risk benefit ratio of ICS should be assessed for each individual patient by the surgeon and anaesthetist involved in the patient's care.

STAFF

All staff involved in the provision of the ICS programme

Pharmacological Agents		
Substances	Effects	Recommended Action
Clotting agents		
Microfibrillar Products Examples: Avitene®, Helitene®, Oxycel®, Gelfoam® Powder, Instat® MCH	May cause platelet aggregation and clot formation. Reported to pass through a microaggregate filter into the bloodstream, 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.
Sponge/Fabric Materials Examples: Surgicel™, Surgicel™ NuKnit®, Gelfoam® Sponge, Helistat®, Instat™, Hemopad®, Super Stat®, HemoFoam®	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.
Topical Liquids Examples: Thrombin–JMI™, Thrombostat®, Thrombogen®	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.

Substances	Effects	Recommended Action
Irrigating solutions		
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.
Antibiotics Examples: Bacitracin, Neomycin, Polymyxin	Can result in renal and neural toxicity if blood is not washed.	Increase amount of wash volume by 500 mL.
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.
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.
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.
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.
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.
Lactated Ringers (in presence of citrate anticoagulant)* *Not an issue if heparin is the anticoagulant used	Calcium present may bind with citrate, negating the anticoagulant effect.	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.
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.

Contaminants		
Substances	Effects	Recommended Action
Methylmethacrylate		
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.
Amniotic Fluid	Contains proteolytic enzymes that may activate clotting.	Amniotic fluid should ideally not be aspirated into the collection reservoir, but should be removed by separate suction prior to starting cell salvage. This recommendation will reduce the initial contamination, although <i>in vitro</i> evidence demonstrates that the cell salvage process can effectively remove plasma phase elements of amniotic fluid whatever the initial load. In life-threatening haemorrhage, therefore, a clinical decision to salvage red cells from the start of the procedure could be carefully considered.
Bone Chips/Bone Grafting Materials	May cause clogging of the system.	Flush suction line occasionally with anticoagulant solution or normal saline to keep clear.
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.
Fat	May not wash out completely.	Retain visible fat layer in reservoir and reinfusion bag. Increase wash volume. If visible fat layer exists in reinfusion bag, piggyback two microaggregate filters between reinfusion bag and transfer pack or infusion set. Use lipid filter.
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.

Substances	Effects	Recommended Action
Contaminants continued		
Infection at Site of Aspiration	Potential for bacteremia.	Avoid aspiration in the presence of purulent material.
Skin Lesions (Infectious)	Incising a lesion may introduce organisms.	Blood recovery may be used if incision is not through a lesion.
Urine	Potential for bacteremia if urinary tract infection is present.	Avoid aspiration into system in the presence of a urinary tract infection.
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 clinician responsible for cell salvage

Malignancy		
Primary at Operative	Evidence indicates the procedure is safe and does not increase the incidence of metastatic disease. The decision to use cell salvage in malignancies must be left to the discretion of the surgeon.	Avoid blood recovery at tumor site. Medical risks and benefits should be discussed between the surgeon and the lead clinician for Cell salvage Consider the use of a leucoreduction filter.
Metastatic at Operative Site	Potential for further spread of disease.	Disease already systemic. Use at discretion of surgeon.
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.
Ascites	Tumor cells may be present.	Avoid aspirating into the system if the surgical procedure is for ovarian malignancy

Substances	Effects	Recommended Action
Haematologic Disorders		
Sickle Cell Trait	Wash procedure produces potential sickling of salvaged cells.	Alert staff of potential for red cell sickling.
Confirmed Sickle Cell Anemia	Wash procedure produces potential sickling of salvaged cells.	Medical risks and benefits should be discussed between the surgeon and the lead clinician for cell salvage
Cold Agglutinin Antibody	Agglutination of red cells may occur at temperatures lower than 37°C (98.6°F). Cold agglutinins are in plasma and will be washed off.	If cold agglutinins show <u>significant</u> activity at room temperature recommend transfusion of blood through a blood warmer.

Miscellaneous		
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 alternate suction source.
Liposuction	Fat concentration in salvaged blood may be too high to remove by washing.	Avoid blood recovery.