

UNC Fluid Guidelines, by Indication

Use of Albumin, [Nonprotein Colloid](#), and [Crystalloid](#) Solutions

Hemorrhag Shock	Hyperbili of Newbrn
Nonhemor Shock	Cirrhosis, Paracent
Hepatic Resection	Nephrotic Syndrome
Thermal Injury	Kidney, Liver Trans
Cereb Perfus Pres	Plasmapheresis
Nutritional Intrvntn	Other Approp Uses
Cardiac Surgery	Inapprop Uses

[Home-Amb-Card-Crit-Neuro-OB-Orth-Pain-Ped-Reg-Tran-Vasc-Misc](#)

Adapted from UHC Guidelines for the Use of Albumin, Nonprotein Colloid, and Crystalloid Solutions, May 2000.

<p>Hemorrhagic Shock</p> <ul style="list-style-type: none"> • <i>Crystalloids should be considered the initial resuscitation fluid of choice.</i> • Nonprotein colloids may be considered over crystalloids when crystalloids (4 L) have failed to produce a response within 2 hours for adult patients. • When nonprotein colloids are contraindicated*, albumin 5 percent may be used. • Patients who experience shock symptoms while under-going hemodialysis are included in this guideline. <p>Back to Top of Page</p>
<p>Nonhemorrhagic (Maldistributive) Shock</p> <ul style="list-style-type: none"> • <i>Crystalloids should be considered first-line therapy for nonhemorrhagic shock.</i> Clinical trials have not shown colloids to be more effective in treating sepsis. • In the presence of capillary leak with pulmonary and/or severe peripheral edema, the administration of up to 4 L of crystalloids in adults before using colloids is appropriate. • If nonprotein colloids are contraindicated*, albumin may be given. • Nonprotein colloids and albumin should be used with caution in patients with systemic sepsis. <p>Back to Top of Page</p>
<p>Hepatic Resection</p> <ul style="list-style-type: none"> • <i>Crystalloid solutions should be used as first-line therapy.</i> • If crystalloids have no effect, and anemia or coagulopathy, or both, are present, then packed red blood cells or fresh frozen plasma should be considered before albumin. • Using albumin to maintain effective circulation volume following major hepatic resection (greater than 40 percent) is appropriate.

- Albumin is indicated when clinically important edema develops secondary to crystalloid administration.

[Back to Top of Page](#)

Thermal Injury

- *Fluid resuscitation should be initiated with crystalloid solutions.*
- If crystalloid resuscitation exceeds 4 L in adults 18 to 26 hours postburn, and burns cover more than 30 percent of the patient's body surface area, nonprotein colloids may be added.
- If nonprotein colloids are contraindicated*, albumin may be used

[Back to Top of Page](#)

Cerebral Perfusion Pressure (CPP)

- *Crystalloid administration should be the first choice of treatment in maintaining CPP for treatment of vasospasm associated with subarachnoid hemorrhage, cerebral ischemia, or head trauma.* Patients with elevated hematocrits should first receive crystalloids to expand intravascular volume. Mannitol should be used to reduce intracranial hypertension.
- If cerebral edema is a concern, albumin should be used in concentrated form (25 percent) as a colloid to maintain CPP.
- If the hematocrit is less than 30, use packed red blood cells to increase the intravascular volume and maintain CPP. If volume therapy alone is ineffective, vasopressors may be needed

[Back to Top of Page](#)

Nutritional Intervention

- *Albumin should not be used as a supplemental source of protein calories in patients requiring nutritional intervention.*
- Patients who cannot tolerate enteral feeding may benefit from the administration of nonprotein colloids if all of the following conditions are met:
 1. Serum albumin less than 2.0 g/dL
 2. Functioning gastrointestinal tract
 3. Failed short-chain peptide formulas

[Back to Top of Page](#)

Cardiac Surgery

- *Crystalloids should be the fluid of choice as the priming solution for cardiopulmonary bypass pumps.*
- The use of nonprotein colloids in addition to crystalloids may be preferable in cases in which it is extremely important to avoid pulmonary shunting.
- For postoperative volume expansion, crystalloids should be considered first-line therapy, followed by nonprotein colloids, and finally albumin.

[Back to Top of Page](#)

Hyperbilirubinemia of the Newborn

- *Albumin should not be administered in conjunction with phototherapy.*
- Albumin may be a useful adjuvant to exchange transfusions when administered concurrently with blood transfusion but it should not be used before transfusion.
- Crystalloids and nonprotein colloids do not have bilirubin binding

properties and should not be considered as alternatives to albumin.

[Back to Top of Page](#)

Cirrhosis and Paracentesis

- *Diet modification (2 g sodium restriction/day) in conjunction with diuretic therapy should be first-line therapy in adult patients who have cirrhosis with ascites.*
- When these fail or are not tolerated and large-volume paracentesis (greater than 5 L) is needed, albumin (25 percent: 6 to 8 g/L removed) or nonprotein colloids should be considered the solution of choice.
- Crystalloids should be considered as adjunctive therapy in patients with cirrhosis when less than 3 L are removed and repletion of intravascular volume is of concern.
- Using albumin alone to treat ascites without large-volume paracentesis or to treat patients with noncirrhotic postsinusoidal portal hypertension should be avoided.

[Back to Top of Page](#)

Nephrotic Syndrome

- *Diuretic therapy alone is the treatment of choice.*
- If diuretic therapy fails, then short-term use of 25 percent albumin in conjunction with diuretic therapy is appropriate for patients with acute severe peripheral or pulmonary edema who have failed diuretic therapy.

[Back to Top of Page](#)

Kidney and Liver Transplantation

- *The effectiveness of albumin and nonprotein colloids during and after renal transplantation surgery has not been conclusively demonstrated.*
- Because of excessive blood loss, volume expanders such as crystalloids, blood products, nonprotein colloids, and albumin may be required intraoperatively for liver transplants.
- Albumin and nonprotein colloids may be useful for postoperative liver transplant patients to control ascites and severe pulmonary and peripheral edema.
- Albumin may be used if the following conditions are met:
 1. Serum albumin less than 2.5 g/dL
 2. Pulmonary capillary wedge pressure less than 12 mm Hg
 3. Hematocrit greater than 30 percent

[Back to Top of Page](#)

Plasmapheresis

- *The use of albumin in conjunction with large volume plasma exchange (greater than 20 mL/kg in one session, or greater than 20 mL/kg/week in repeated sessions) is appropriate.*
- Nonprotein colloids and crystalloids may be substituted for some of the albumin in therapeutic plasmapheresis procedures and should be considered cost-effective exchange mediums.

[Back to Top of Page](#)

Other Uses Considered Appropriate on the Basis of Limited Medical Evidence and Results of the Consensus Exercise

1. Erythrocyte Sedimenting Agent

- a. Granulocytapheresis (nonprotein colloids): As a sedimenting solution for the collection of granulocytes and for acute cytoreduction in leukemia with symptomatic hyperleukocytosis.
 - b. Stem cell separation (nonprotein colloids) for major ABO-incompatible bone marrow transplantation.
2. Cryopreservation
 - a. Cryopreservation solutions for solid-organ transplant (albumin or nonprotein colloids).
 - b. Stem cell cryopreservation (nonprotein colloids): As part of preservation solutions for frozen storage of hematopoietic stem cells.
 3. Pretreatment of Dacron grafts before surgery and to decrease bacterial adherence.
 4. Acute normovolemic hemodilution in surgery (nonprotein colloid only appropriate).

[Back to Top of Page](#)

Other Uses Considered Inappropriate on the Basis of the Results of the Consensus Exercise

1. Hypoalbuminemia
2. Impending hepatorenal syndrome
3. Increasing drug efficacy
4. Acute pancreatitis
5. Chronic pancreatitis
6. Volume expansion in neonates, unless expansion with 10 mL/kg of crystalloids was unsuccessful
7. Acute normovolemic hemodilution in surgery (albumin inappropriate)
8. Intradialytic blood pressure support
9. Ovarian hyperstimulation syndrome

Crystalloid solutions: lactated Ringer's solution, 0.9% sodium chloride solution

Nonprotein colloid solutions: hetastarch, dextran, and other synthetic colloidal products

*Relative contraindications to the use of nonprotein colloids:

- Previous hypersensitivity to the components of the solution
- Underlying bleeding disorders
- Risk of serious intracranial hemorrhage
- Renal failure with either oliguria or anuria