Albumin (Normal Human Serum)

Brand names	**50 mg/mL:** Albuked 5, Albuminar-5, AlbuRx 5, Albumin (Human) 5% Solution, Albutein 5%, Buminate 5%, Flexbumin 5%, Plasbumin-5 **200 mg/mL:** Albuminar-20, Human Albumin Grifols 20%, Plasbumin-20 **250 mg/mL:** Albuked 25, Albuminar-25, Albumin (Human) 25% Solution, Albutein 25%, AlbuRx 25, Buminate 25%, Flexbumin 25%, Human Albumin Grifols 25%, Kedbumin, Plasbumin-25
Medication error potential	None noted
Contraindications and warnings	**Contraindications:** Patients who (1) are severely anemic, (2) have cardiac failure, or (3) have known hypersensitivity to albumin products.[32] When administering concentrated albumin (20% to 25%) to patients with marked dehydration, monitor closely as these patients may require additional fluids.[19,33] Concentrated albumin (20% to 25%) solutions are relatively low in electrolytes compared to 4% to 5% solutions. Monitor patient electrolyte status regularly.[19] Some albumin products (Buminate 5%, Buminate 25%) contain components made with natural rubber latex.[34,35] Anaphylaxis has been reported in an *adult*.[2]
Infusion-related cautions	Too rapid infusion may result in acute hypertension or vascular overload, causing pulmonary edema or cardiac failure.[18,32] Infusion over a longer time (8–12 hours in patients with nephrotic syndrome) decreases the risk for the development of CHF.[3] Monitor blood pressure in trauma patients and postoperative patients being resuscitated with albumin 5% to detect rebleeding secondary to clot disruption.[34] Premature neonates are at risk for intraventricular hemorrhage from rapid intravascular volume expansion.[4] Allergic reactions may result in chills, fever, nausea, vomiting, or urticaria.[25]
Dosage	**Hypovolemia:** 0.5–1.25 g/kg (or generally 10–20 mL/kg).[25,35,36] 20 mL/kg of 4.5% (0.9 g/kg)[5] and 5% albumin (1 g/kg)[6] have been given over 20 minutes in premature neonates. A post hoc analysis of an *adult* randomized controlled trial found that NS was preferable to albumin 4% for acute resuscitation of patients with severe traumatic brain injury (improved mortality and neurologic outcomes).[7] **Hypoalbuminemia:** Albumin deficits have been replaced by intermittent infusions of up to 1 g/kg of albumin 25%.[8] Manufacturers recommend that doses should not exceed 2 g/kg/day[34,35,37] or 25 g/day (in children) in the absence of ongoing albumin losses.[33] Continuous infusion of albumin results in a more sustained increase in serum albumin concentration.[9] The albumin deficit can be estimated with the following equation: g albumin = weight (kg) × 3 dL/kg × (3.5 – observed serum albumin in g/dL)[10,11] **Nephrotic syndrome (controversial):** 0.25–1 g/kg of albumin 25% infused over ≥1–12 hours.[3,12,13] Furosemide (0.5–2 mg/kg)[3,12-14] infusions may accompany or follow the albumin infusion and have been shown to result in better weight loss, diuresis, and sodium excretion compared to either therapy alone.[14,15] Alternatively, 1 g/kg of albumin 20% over 4 hours with furosemide continuous infusion of 0.3 mg/kg/hr has also been used.[15] **Neonatal hyperbilirubinemia:** In one randomized study, neonates receiving 1 g/kg of albumin 20% 1 hour before exchange transfusion had a greater reduction in total serum bilirubin and required a shorter duration of phototherapy compared to those receiving exchange transfusions without albumin.[16] Albumin 25% may be used.[21]

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Dosage adjustment in organ dysfunction	None noted.[25] Consider using low aluminum-containing products in patients with chronic kidney failure.[31]
Maximum dosage	For hypoalbuminemia, should not exceed 2 g/kg/day[34,35,37] or 25 g/day (in children) in the absence of ongoing albumin losses.[33] Should not exceed 250 g in 48 hours in *adults*.[1]
Additives	Contains 130–160 mEq sodium/L of albumin.[17,24] Aluminum is present as a contaminant. Formulations containing ≤200 mcg/L aluminum include AlbuRx 5, AlbuRx 25, Albutein 5%, Albutein 25%, Human Albumin Grifols 20%, Human Albumin Grifols 25%, Kedbumin, and Plasbumin-25.[18-24,26] Contains no preservatives or antimicrobials.[17,24,26]
Suitable diluents	Manufacturers recommend dilution with D5W or NS.[21,26,38,39] Albumin is stable in D10W.[17] In patients who require sodium restriction, a 5% albumin solution that contains less sodium can be prepared by diluting each 1 mL of albumin 25% in 4 mL of D5W or D10W. However, infusion of large amounts of albumin diluted with D5W can result in hyponatremia; therefore, when using large volumes of albumin, dilution in NS is preferred.[26,33] Kidney failure and fatal hemolysis may occur if SW is used as a diluent.[17,27,28]
Maximum concentration	Undiluted (25%, 250 mg/mL)
Preparation and delivery	**Compatibility:** *Parenteral products should be visually inspected for particulate matter and discoloration before use. Refer to appropriate reference for more information on compatibility with other drugs and solutions, compatibility following Y-site delivery, and suggested storage and extended stability*.[17] **Delivery:** Do not use if solution is turbid.[17] The infusion should begin within 4 hours of opening the bottle.[17,34] Institution-specific protocols for blood product infusions should be used to guide infusion duration from an opened bottle. Solutions containing >25 g/L of albumin are more likely to occlude 0.22-micron inline filters; however, PN solutions containing as little as 10.8 g/L caused filter occlusion.[29,30] Manufacturers recommend that albumin not be mixed with protein hydrolysates because it may cause proteins to precipitate.[34,35,39]
IV push	When used as a plasma volume expander in the treatment of hypovolemic shock, the rate of administration should be adapted to the patient response.[18,36] (See the Infusion-Related Cautions section.)
Intermittent infusion	In the absence of overt shock, infuse albumin 5% at 1–2 mL/min (60–120 mL/hr).[20] In severe hypovolemia, faster rates may be required.[26] Manufacturers recommend infusion rates of 200–600 mL/hr for albumin 5% (faster if necessary in patients with decreased plasma volume except in patients with cardiovascular disease),[32,34] and rates not to exceed 120 mL/hr for albumin 25%.[33] (See the Infusion-Related Cautions section.)
Continuous infusion	Can be infused continuously. (See the Preparation and Delivery section.)
Other routes of administration	Not indicated