IV Solution Cheat Sheet

A quick reference guide on the different intravenous solutions.

Type	Use	Special Considerations
Normal Saline (NS) • 0.9% NaCl in Water • Crystalloid Solution • Isotonic (308 mOsm)	• Increases circulating plasma volume when red cells are adequate • Shock • Fluid replacement in patients with diabetic ketoacidosis • Hyponatremia • Blood transfusions • Resuscitation • Metabolic Alkalosis • Hypercalcemia	• Do not use in patients with heart failure, edema, or hypernatremia, because NSS replaces extracellular fluid and can lead to fluid overload. • Replaces losses without altering fluid concentrations. • Helpful for Na+ replacement
1/2 Normal Saline (1/2 NS) • 0.45% NaCl in Water • Crystalloid Solution • Hypotonic (154 mOsm)	• Water replacement • Raises total fluid volume • DKA after initial normal saline solution and before dextrose infusion • Hypertonic dehydration • Sodium and chloride depletion • Gastric fluid loss from nasogastric suctioning or vomiting.	• Use cautiously; may cause cardiovascular collapse or increase in intracranial pressure. • Don't use in patients with liver disease, trauma, or burns. • Useful for daily maintenance of body fluid, but is of less value for replacement of NaCl deficit. • Helpful for establishing renal function. • Fluid replacement for clients who don't need extra glucose (diabetics)
Lactated Ringer's (LR) • Normal saline with electrolytes and buffer • Isotonic (275 mOsm)	• Replaces fluid and buffers pH • Hypovolemia due to third-space shifting. • Dehydration • Burns • Lower GI tract fluid loss • Acute blood loss	• Has similar electrolyte content with serum but doesn't contain magnesium. • Has potassium therefore don't use to patients with renal failure as it can cause hyperkalemia • Don't use in liver disease because the patient can't metabolize lactate; a functional liver converts it to bicarbonate; don't give if patient's pH > 75. • Normal saline with K+, Ca++, and lactate (buffer) • Often seen with surgery

D_5W • Dextrose 5% in water Crystalloid solution • Isotonic (in the bag) • *Physiologically hypotonic (260 mOsm)	• Raises total fluid volume. • Helpful in rehydrating and excretory purposes. • Fluid loss and dehydration • Hypernatremia	• Solution is isotonic initially and becomes hypotonic when dextrose is metabolized. • Not to be used for resuscitation; can cause hyperglycemia • Use in caution to patients with renal or cardiac disease, can cause fluid overload • Doesn't provide enough daily calories for prolonged use; may cause eventual breakdown of protein. • Provides 170-200 calories/1,000cc for energy. • **Physiologically hypotonic** -the dextrose is metabolized quickly so that only water remains - a hypotonic fluid
D_5NS • Dextrose 5% in 0.9% saline • Hypertonic (560 mOsm)	• Hypotonic dehydration • Replaces fluid sodium, chloride, and calories. • Temporary treatment of circulatory insufficiency and shock if plasma expanders aren't available • SIADH (or use 3% sodium chloride). • Addisonian crisis	• Do not use in patients with cardiac or renal failure because of danger of heart failure and pulmonary edema. • Watch for fluid volume overload
D_5 1/2 NS • Dextrose 5% in 0.45% saline • Hypertonic (406 mOsm)	• DKA after initial treatment with normal saline solution and half-normal saline solution – prevents hypoglycemia and cerebral edema (occurs when serum osmolality is reduced rapidly).	• In DKA, use only when glucose falls < 250 mg/dl • Most common postoperative fluid • Useful for daily maintenance of body fluids and nutrition, and for rehydration.
D_5LR • Dextrose 5% in Lactated Ringer's • Hypertonic (575 mOsm)	• Same as LR plus provides about 180 calories per 1000cc's. • Indicated as a source of water, electrolytes and calories or as an alkalinizing agent	• Contraindicated in newborns (≤ 28 days of age), even if separate infusion lines are used (risk of fatal ceftriaxone-calcium salt precipitation in the neonate's bloodstream). • Contraindicated in patients with a known hypersensitivity to sodium lactate.
Normosol-R • Normosol • Isotonic (295 mOsm)	• Replaces fluid and buffers pH • Indicated for replacement of acute extracellular fluid volume losses in surgery, trauma, burns or shock. • Used as an adjunct to restore a decrease in circulatory volume in patients with moderate blood loss	• Not intended to supplant transfusion of whole blood or packed red cells in the presence of uncontrolled hemorrhage or severe reductions of red cell volume