

Newborn Critical Care Center (NCCC) Clinical Guidelines

Guidelines for the Administration of Intravenous Potassium Chloride

BACKGROUND

When potassium replacement is necessary, the enteral route of administration is preferred. In neonates, enteral administration is often not possible. For those patients, increasing the potassium concentration of the maintenance IV fluids or TPN is usually sufficient. Rarely, more rapid potassium repletion through IV administration may be necessary. This is often seen in patients receiving diuretic therapy or with rapidly changing renal function. **Intravenous potassium chloride (KCl) repletion requires the approval of the attending neonatologist or neonatology fellow.**

Normal serum potassium levels:

- Preterm infants – 4 to 6.5 mmol/L
- Newborns – 3.7 to 5.9 mmol/L
- Infants – 4.1 to 5.3 mmol/L

Degrees of hypokalemia are defined as follows:

- Severe hypokalemia – Potassium level less than 2.5 mEq/L
- Moderate hypokalemia – Potassium level between 2.5 and 3 mEq/L
- Mild hypokalemia – Potassium level between 3 and 3.5 mEq/L

RATE OF ADMINISTRATION

1. Administration rates should not exceed 0.25 mEq/kg/hour based on a patient's weight obtained within the last 48 hours (or dosing weight if appropriate based on clinical status).
WARNING: The use of an infusion pump is **required** to control the rate of infusion.
2. Symptomatic/Severe hypokalemia (flattened ST segment, U wave elevation, dysrhythmias, ileus, obtundation)
 - a. An infusion with a potassium concentration of no more than 40 mEq/L is given at a rate not to exceed 0.5 to 1 mEq/kg/hr.
 - i. **A rate exceeding 0.5 mEq/kg/hr. requires approval from the attending neonatologist or a neonatology fellow.**
 - b. The goal is to raise the potassium level by 0.3 to 0.5 mEq/L in 12-24 hours.
3. Electrocardiographic (ECG) monitoring is mandatory for patients receiving intravenous infusions of KCl. Rapid infusions of KCl may precipitate arrhythmias, heart block, and cardiac arrest.

ECG changes during infusion may include:

- Peaked T waves
- Widening of the QRS interval greater than 25% of baseline
- ST segment depression
- Decreased amplitude or disappearance of the P wave
- Prolongation of the QT interval

CONCENTRATIONS OF POTASSIUM CHLORIDE SOLUTIONS

1. Central access is the preferred route for administering KCl, given the higher risk of extravasation with peripheral KCl infusions.
2. Two concentrations of KCl are available for administration in NCCC:
 - a. **Peripheral:** Diluted KCl syringe in a concentration of 0.1 mEq/mL
 - b. **Central:** Diluted KCl syringe in a concentration of 0.2 mEq/mL

SERUM POTASSIUM MONITORING

1. Potassium monitoring should be performed using a free-flowing sample (venous or arterial), if feasible.
2. It is recommended that NCCC patients requiring large replacement doses of potassium have their serum potassium measured after each 1 mEq/kg of intravenous potassium is administered, or after 4 mEq/kg of oral potassium is administered, and at least once daily.
3. Blood samples should be drawn at least 1 hour after the completion of intravenous administration of potassium.
4. Consider all sources of potassium that the patient is receiving when calculating the amount of potassium chloride given per unit of time (e.g., TPN, enteral, and IV).
5. Assess magnesium levels in the hypokalemic patient. Successful potassium repletion can depend on correcting low magnesium levels.

PRESCRIBING INTRAVENOUS POTASSIUM CHLORIDE

1. All KCl infusion/bolus orders must be approved by the attending neonatologist or neonatology fellow, and such approval should be documented in the “comments” section of the order.
2. Rates of administration that exceed 0.25 mEq/kg/hr. should be justified in the “comments” section of the order

References:

Michael J Somers, MD, Avram Z Traum, MD. Hypokalemia in Children. In: Connor R, ed. UpToDate. Wolters Kluwer; 2024. Accessed November 1, 2025