

UNC MEDICAL CENTER GUIDELINE

Management of Acute Hyperkalemia in Pediatrics

This guideline provides suggested management of acute hyperkalemia in hospitalized pediatric patients at UNC Medical Center.

DEFINITIONS

Hyperkalemia is defined by the amount of potassium in the blood and by signs or symptoms of hyperkalemia as follows:

- Mild Hyperkalemia – potassium 5.6- < 6 mmol/L
- Moderate Hyperkalemia – potassium 6-7 mmol/L
- Severe Hyperkalemia – potassium > 7 mmol/L

CLINICAL PEARLS

- Confirm blood sample is not hemolyzed

MANAGEMENT OF HYPERKALEMIA

Serum potassium \geq 6 mmol/L but < 7 mmol/L (non-hemolyzed)

1. Remove all sources of exogenous potassium (i.e. IV fluids and enteral feeds). Rehydrate if necessary.
2. Obtain STAT 12 lead ECG
 - a. If ECG changes are present, **proceed to medical management**
 - b. In the absence of ECG changes, expectant management is appropriate. Repeat serum potassium to establish trend.

Serum potassium \geq 7 mmol/L (non-hemolyzed)

1. Remove all sources of exogenous potassium (i.e. IV fluids and enteral feeds). Rehydrate if necessary.
2. Obtain STAT 12 lead ECG; however, **medical management** is recommended even in the absence of ECG changes
3. Proceed to Medical Management

MEDICAL MANAGEMENT

1. Stabilize conducting tissues (*Note: Calcium should be administered **FIRST** for cardioprotection prior to electrolyte shifts*)
 - a. Calcium chloride (10%) 20 mg/kg (Max 1,000mg) IV over 10-30 minutes
 - i. Drug of choice in cardiac arrest
 - ii. Requires central IV access
 - b. Calcium gluconate (10%) 100 mg/kg (Max 2,000mg) IV over 10-30 minutes
 - i. Recommended for non-emergent situations
 - ii. Drug of choice in Newborn Critical Care Center (NCCC) and acute care floors
 - iii. May be infused both centrally and peripherally

2. Shift potassium into the intracellular space
 - a. Insulin and Glucose
 - i. Neonatal:
 1. Dextrose 10% 2 mL/kg bolus IV over 30 minutes followed by Human Regular Insulin 0.05 units/kg IV/SQ given over 5 minutes
 2. After initial bolus dose, may consider initiating continuous infusions
 - a. Dextrose 10% at maintenance rate to meet total fluid goal
 - b. Human Regular Insulin 0.05-0.1 units/kg/hr
 - ii. Pediatric:
 1. Dextrose 0.5 g/kg (Max 25g) IV over 30 minutes followed by Human Regular Insulin 0.1 units/kg (Max 10 units) IV/SQ given over 5 minutes
 - a. Consider a maximum dose of 5 units/dose of Regular Insulin in patients with an Acute Kidney Injury/Chronic Kidney Disease
 2. Dextrose:
 - a. < 5 years old
 - i. Dextrose 10% at 5 mL/kg/dose
 - b. \geq 5 years old
 - i. Dextrose 25% at 2 mL/kg/dose (Max 25 grams or 100 mL)
 - ii. If central access is not available, may use Dextrose 10% at 5 mL/kg/dose (Max 25 grams or 250 mL)
 - c. If patient is hyperglycemic (Blood glucose > 250), may not need to administer concomitant dextrose therapy
 - iii. Clinical Pearls:
 1. Administer dextrose immediately before the administration of insulin to prevent hypoglycemia
 2. Only administer insulin subcutaneously if IV access is unavailable
 3. Check blood glucose every 1 hour after insulin administration of 6 hours
 - b. Albuterol Nebulization
 - i. Recommended Dose:
 1. Neonate: 0.4 mg
 2. Infants and < 25 kg: 2.5 mg
 3. 25-50 kg: 5 mg
 4. > 50 kg: 10 mg
 - c. Sodium Bicarbonate
 - i. Dose: 1-2 mEq/kg/dose (Max 50 mEq) IV over 30 minutes – May repeat X 1
 - ii. Concentration:
 1. < 5 kg – 4.2%
 2. \geq 5 kg – 8.4%
3. Remove excess potassium from the body
 - a. Loop Diuretics
 - i. Furosemide 1 mg/kg/dose (Max 40 mg/dose) IV X 1
 - b. Cation Exchange Resins

- i. Kayexalate
 1. Dose 1 g/kg by mouth or per rectum
 2. *Note: Use has been associated with bowel necrosis. Avoid use in patients with bowel obstruction, recent surgery, or use of rectal SPS.*
 3. *Use is NOT recommended in preterm infants or infants with bowel compromise*
 - ii. In certain patients > 40 kg or > 13 years of age, may consider using Sodium zirconium cyclosilicate
 1. Dose 10 g by mouth once
 2. *Avoid use in patients with severe constipation, bowel obstruction or impaction, including abnormal postoperative bowel motility disorders (may be ineffective and may worsen GI conditions).*
 3. Not FDA approved in pediatric patients
- c. Dialysis

MONITORING

- Continuous cardiac monitoring and serial ECGs should be obtained to monitor response to therapies
- Repeat serum potassium level within 1 to 2 hours of initiation of treatment
- Patients who receive insulin should have hourly glucose measurements for up to 6 hours to monitor for hypoglycemia
- In patients who fail to respond or continue to have ECG changes, may repeat medical management

REFERENCES

1. Daly K, Farrington E. Hypokalemia and Hyperkalemia in Infants and Children: Pathophysiology and Treatment. *Journal of Pediatric Health Care*. 2013;27(6),486-496. <http://dx.doi.org/10.1016/j.pedhc.2013.08.003>. Accessed November 8, 2021.
2. Somers MJ. Management of hyperkalemia in children. In: UpToDate, Mattoo TK (Ed), UpToDate, Waltham, MA. (Accessed on February 17, 2021).