NORTH YORK GENERAL

- Patient Information -

Please check appropriate boxes: **Please use menu "File" > "Print"**

Hyperkalemia (Adult) (Module)

Admission

- Please clink on link to NYGH document - Emergency Treatment of Hyperkalemia **Source**
- In asymptomatic patients with no ECG changes, rule out pseudo-hyperkalemia which can be related to blood drawing technique (hemolyzed specimen), thrombocytosis, or very high WBC (AML, CLL, lymphoma)
- Most serious manifestations of hyperkalemia (usually with potassium greater than or equal to 7 mmol/L, lower with acute hyperkalemia) are muscle weakness or paralysis, cardiac conduction abnormalities, and cardiac arrhythmias (sinus bradycardia or arrest,slow idioventricular rhythms, VT, VF, and asystole)

Cardiac Monitoring/ Telemetry

- ☐ Severe E'lyte/Metabolic Abnormalities

Vital Signs

Vital Signs

- ☐ q1h x 4 hours

Vital Signs

- ☑ q4h
- ☐ q6h,
- ☐ q8h,

Patient Care

Assessments

Intake and Output

- ☐ q8h,
- ☐ ***Other*** _____

Communications

Notify Provider Vital Signs

- ☐ Heart Rate greater than 110 , Heart Rate less than 50 , Systolic Blood Pressure greater than 180 , Systolic Blood Pressure less than 90 , Diastolic Blood Pressure greater than 110 , Diastolic Blood Pressure less than 45 O2 Saturation less than 89 ,
- ☐ ***Other*** _____

Medications

- Hyperkalemia is unpredictable and potentially life-threatening. Initiate emergency treatment when plasma potassium is > 6.5 mmol/L AND/OR if ECG manifestations are present regardless of potassium level. **Source**
- Patients with marked tissue breakdown (rhabdomyolysis, crush injury, tumour lysis) also require urgent therapy, even with milder degree of hyperkalemia
- Treatment is based on three main mechanisms: membrane stabilization to counteract cardiac toxicity, redistribution of potassium into cells, elimination of potassium via renal and gastric routes. **Source**
- Consider holding all agents which may contribute to hyperkalemia (eg. amiloride, triamterene, ARBs, ACE inhibitors, beta-blockers, digoxin at toxic levels, eplerenone, ethinyl estradiol/ drospirenone (Yasmin OC), heparins, herbal remedies with digitalis-like effect, NSAIDs, packed red blood cells, penicillin G potassium, spironolactone, trimethoprim.) **Source**
- For patients with severe hyperkalemia associated with RENAL FAILURE and/or MARKED TISSUE BREAKDOWN who fail conservative treatment: consider referral to nephrology and/or early transfer to the nearest hemodialysis centre. (Use CritiCall 1-800-668-4357).

STEP 1: Membrane Stabilization

- Calcium antagonizes cardiac toxicity by stabilizing the myocardium and has beneficial effects even in normocalcemic patients. Calcium has an immediate onset of action, and its effect lasts for 30 minutes so it should NOT be administered as monotherapy **Source**
- Hyperkalemic patients with ECG changes and taking digoxin may be digoxin-toxic. Consider immediate treatment with DigiFab (see Antidote Manual). Caution should be exercised with calcium use as it may worsen the myocardial effects associated with digoxin toxicity. **Source**
- Calcium gluconate is preferred over calcium chloride because of less likelihood to cause tissue necrosis with extravasation. **Source**

calcium gluconate inj

Physician's Name/Signature: **Date/Time:**

Posted By: **Date/Time:**

PHYSICIAN'S ORDERS

Please check appropriate boxes: **Please use menu "File" > "Print"**

- ☐ 1 g Inj IV ONCE Instructions: Slow IV bolus over 2 min (***MD ONLY outside of CrCU, Emerg, PACU***) Maximum rate of infusion 5 mL/min of 10% undiluted solution.
- Continuous ECG monitoring is required. May repeat dose in 5 minutes if ECG changes persist or worsen

calcium gluconate inj

- ☐ 1 g Inj IV ONCE Instructions: (DOSE 2) Slow IV bolus over 2 min (***MD ONLY outside of CrCU, Emerg, PACU***) Maximum rate of infusion 5 mL/min of 10% undiluted solution.

☐ ***Other*** _____

STEP 2a: Redistribution with Insulin

- Check capillary blood glucose BEFORE ordering insulin & dextrose
- To prevent hypoglycemia, give insulin AFTER dextrose in a ratio of 1 unit of insulin for every 2.5 g of dextrose. (Giving dextrose FIRST appears be associated with fewer hypoglycemic events.) **Source**
- If hyperglycemia > 20 mmol/ L, give insulin alone WITHOUT dextrose.

Dextrose 50% in Water inj

- ☐ 50 mL Inj IV ONCE Infuse Over: 5 min Instructions: (Administer immediately BEFORE 10 units of insulin.)
- ☐ 25 mL Inj IV ONCE Infuse Over: 5 min Instructions: (Administer immediately BEFORE 5 units of insulin.)
- ☐ 100 mL Inj IV ONCE Infuse Over: 5 min Instructions: (Administer immediately BEFORE 20 units of insulin.)

HumuLIN R

- ☐ 10 unit Inj IV ONCE CrCU/Emerg/PACU: Give as IV bolus. Outside CrCU/Emerg/PACU: RN may administer over 20 min (or IV bolus administration by MD)
- ☐ 5 unit Inj IV ONCE CrCU/Emerg/PACU: Give as IV bolus. Outside CrCU/Emerg/PACU: RN may administer over 20 min (or IV bolus administration by MD)
- ☐ 20 unit Inj IV ONCE CrCU/Emerg/PACU: Give as IV bolus. Outside CrCU/Emerg/PACU: RN may administer over 20 min (or IV bolus administration by MD)

Capillary Blood Glucose Monitoring

- ☐ q30min x 2 hours following the administration of IV insulin/D50W

☐ ***Other*** _____

STEP 2b: Redistribution with Salbutamol

- Salbutamol should never be used as monotherapy of hyperkalemia. **Source**
- Salbutamol dose is at least 4 times that used for bronchospasm and may be associated with mild tachycardia. **Source**
- Effects of insulin and salbutamol are additive. **Source**
- Patients using non-selective beta-blockers may be resistant to hypokalemic effects of salbutamol. **Source**
- Please select ONE of the following options:

Ventolin 100 mcg/puff MDI

- ☐ 12 puff Inhaler INH ONCE Comments: Use with valved holding chamber (e.g. Aerochamber, Prochamber)
- ☐ 12 puff Inhaler INH ONCE Comments: Use with valved holding chamber WITH MASK (e.g. Aerochamber, Prochamber)

Ventolin inhalation solution

- ☐ 20 mg Inh Soln INH ONCE Instructions: NO SUBSTITUTION in 4 mL saline nebulized over 10 mins

☐ ***Other*** _____

Metabolic Acidosis

- RESERVE sodium bicarbonate for cases with co-existing METABOLIC ACIDOSIS; even in this setting, it has limited efficacy and should not be used as monotherapy. **Source**
- Loop diuretics may help counteract volume expansion with bicarbonate use. **Source**
- BOLUS THERAPY

sodium bicarbonate 8.4% inj **Source**

- ☐ 50 mEq Inj IV ONCE Instructions: BOLUS *** MD ONLY outside of CrCU, Emerg, PACU ***
- Prior to ordering a repeat bicarbonate bolus, please consult Internal Medicine/intensivist.

sodium bicarbonate 8.4% inj **Source**

- ☐ 50 mEq Inj IV ONCE PRN Other (See Comment) Duration: 1 dose Instructions: BOLUS *** MD ONLY outside of CrCU, Emerg, PACU *** (This is a REPEAT dose.)

Physician's Name/Signature: **Date/Time:**

Posted By: **Date/Time:**

PHYSICIAN'S ORDERS

NORTH YORK GENERAL

- Patient Information -

Please check appropriate boxes: **Please use menu "File" > "Print"**

- CONTINUOUS INFUSION may be beneficial in renal failure

sodium bicarbonate 8.4% inj Source

- ☐ 100 mEq Inj IV ONCE 8 HR in 900 mL D5W . Give after one or more bolus(es) of sodium bicarbonate. Remove 100 mL from a 1000 mL D5W bag to add 100 mEq (=100 mL) Sodium Bicarbonate

☐ ***Other*** _____

STEP 3: Volume Overloaded Patients

- POTASSIUM ELIMINATION: Give loop diuretics in patients with volume overload. Diuretic effects may be blunted in patients with renal failure. Source

Lasix inj Source

- ☐ 20 mg Inj IV ONCE Hold if SBP < 95 mmHg,
- ☐ 40 mg Inj IV ONCE Hold if SBP < 95 mmHg,
- ☐ 60 mg Inj IV ONCE Hold if SBP < 95 mmHg,
- ☐ 80 mg Inj IV ONCE Hold if SBP < 95 mmHg,

☐ ***Other*** _____

STEP 3: Euvolemic/Hypovolemic Patients

- POTASSIUM ELIMINATION: Consider normal saline in euvolemic/hypovolemic patients NOT on dialysis Source

normal saline Bolus

- ☐ 250 mL IV NOW 1 HR 1 dose Give as bolus
- ☐ 500 mL IV NOW 1 HR 1 dose Give as bolus
- ☐ 1000 mL IV NOW 1 HR 1 dose Give as bolus

normal saline

- ☐ 1000 mL Bag IV 75 mL/hr
- ☐ 1000 mL Bag IV 100 mL/hr

☐ ***Other*** _____

Potassium Lowering Agents

- Cation exchange resins have a SLOW ONSET so should be combined with rapidly-acting therapies. Use only in patients with severe hyperkalemia, when other therapies have failed (e.g. diuretics, restoration of kidney function). Source
- SAFETY: Contraindicated in post-op patients, patients with ileus, receiving opioids, and bowel obstruction. Source
- ROUTE: rectal route of resins should be reserved for patients who are vomiting or who have upper GI tract problems
- Each gram of sodium polystyrene sulfonate will bind 1 mEq potassium. Calcium resonium binds DOUBLE this amount.
- Oral potassium-lowering resins may be given up to four times in a day.
- Consider calcium resonium in preference to sodium polystyrene (Kayexalate) in any fluid overload state (eg. heart failure, hypertension etc). Note: it is contraindicated in patients with hypercalcemia

Resonium Calcium

- ☐ 15 g Powder PO ONCE Mix dose with 3-4 mL of water for each gram of resin. Do not mix with juice.
- ☐ 30 g Powder PO ONCE Mix dose with 3-4 mL of water for each gram of resin. Do not mix with juice
- ☐ 15 g Powder PO bid Duration: 1 days Mix dose with 3-4 mL of water for each gram of resin. Do not mix with juice
- ☐ 30 g Powder PO bid Duration: 1 days Mix dose with 3-4 mL of water for each gram of resin. Do not mix with juice
- ☐ 30 g Powder PR ONCE RETENTION ENEMA (1) Administer a cleansing enema first. (2) Mix 30 g resin in 150-200 mL of plain water. (3) Warm mixture to body temperature. Agitate mixture during administration. The enema should be retained for as long as possible. (at least 30-60 min). (4) Then follow with another cleansing enema, to remove the resin. SEE PRODUCT MONOGRAPH for details

- Warning: There is a small risk of colonic necrosis when potassium exchange resins are combined with sorbitol. The oral suspension below contains sorbitol

Kayexalate oral suspension

- ☐ 15 g Oral Susp PO ONCE
- ☐ 30 g Oral Susp PO ONCE
- ☐ 15 g Oral Susp PO bid Duration: 1 days
- ☐ 30 g Oral Susp PO bid Duration: 1 days

Physician's Name/Signature: **Date/Time:**

Posted By: **Date/Time:**

PHYSICIAN'S ORDERS

NORTH YORK GENERAL

Please check appropriate boxes: **Please use menu "File" > "Print"**

Kayexalate Source
- ☐ 30 g Powder PR ONCE RETENTION ENEMA (1) Administer a cleansing enema. (2) Mix powder in 150-200 mL plain water. (3) Warm mixture to body temperature. Agitate mixture during administration. The enema should be retained for as long as possible (at least 30-60 min). (4) Then follow with another cleansing enema, to remove the resin. SEE PRODUCT MONOGRAPH for details
- ☐ 30 g Powder PR bid Duration: 1 days RETENTION ENEMA (1) Administer a cleansing enema. (2) Mix powder in 150-200 mL plain water. (3) Warm mixture to body temperature. Agitate mixture during administration. The enema should be retained for as long as possible (at least 30-60 min). (4) Then follow with another cleansing enema, to remove the resin. SEE PRODUCT MONOGRAPH for details

☐ ***Other*** _____

Antiemetics

Gravol
- ☐ 50 mg Tab PO/NG q4h PRN Nausea/Vomiting Instructions: Range dose 25-50 mg. Maximum 400 mg dimenhydrinate per 24 hours.

Gravol inj
- ☐ 50 mg Inj IV q4h PRN Nausea/Vomiting Instructions: Range dose 25-50 mg. Maximum 400 mg dimenhydrinate per 24 hours.
- ☐ 50 mg Inj IM q4h PRN Nausea/Vomiting Instructions: Range dose 25-50 mg. Maximum 400 mg dimenhydrinate per 24 hours.

☐ ***Other*** _____

Laboratory

Chemistry

- Serum potassium should be measured 1-2 hours after the initiation of therapy. Timing of subsequent measurements should be determined by the serum potassium concentration and the response to therapy.

Electrolytes (Na / K / Cl)
- ☐ ASAP

Electrolytes (Na / K / Cl)
- ☐ ASAP

Electrolytes (Na / K / Cl)
- ☐ Multi-Hour q6hr , for 24 HR

Electrolytes (Na / K / Cl)
- ☐ Routine in AM
- ☐ Routine in AM daily, for 3 days

Creatinine Serum
- ☐ ASAP

Creatinine Serum
- ☐ Routine in AM
- ☐ Routine in AM daily, for 3 days

Urea Serum
- ☐ Routine in AM
- ☐ ASAP

Glucose Random
- ☐ Routine in AM
- ☐ ASAP

- Use CAMP module to order Calcium, Albumin, Mg, PO4 x 1
- Order CK daily x 3 days for patients with Rhabdomyolysis

CK
- ☐ Routine in AM daily, for 3 days

☐ ***Other*** _____

Hematology

Physician's Name/Signature: **Date/Time:**

Posted By: **Date/Time:**

PHYSICIAN'S ORDERS

NORTH YORK GENERAL

- Patient Information -

Please check appropriate boxes: **Please use menu "File" > "Print"**

CBC
- ☐ Routine in AM daily, for 3 days
- ☐ ***Other*** _____

Fluids/Stones/Stools

Routine Urinalysis
- ☐ Routine

Electrolytes Urine Random
- ☐ Routine
- ☐ ***Other*** _____

Other Investigations

- While ECG is recommended in all patients with significant hyperkalemia to assess for cardiac sequelae, the ECG is not diagnostic of hyperkalemia in approximately 50% of patients. **Source**

ECG
- ☐ STAT
- ☐ ASAP

- If the ECG shows abnormalities due to hyperkalemia, consider repeating the ECG Q6H until it returns to baseline.

ECG
- ☐ Routine q6h 24 HR
- ☐ Routine in AM daily 3 days
- ☐ Routine in AM

Non Categorized

- This electronic order set is property of North York General Hospital. Unauthorized duplication or transmission is prohibited. The suggested orders, reminders, and third-party web links included in this electronic order set are for informational purposes only, and are not a substitute for professional medical judgment. Click link for further details **Source**

Physician's Name/Signature: **Date/Time:**

Posted By: **Date/Time:**

PHYSICIAN'S ORDERS

Print All