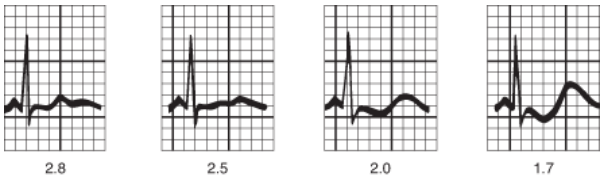
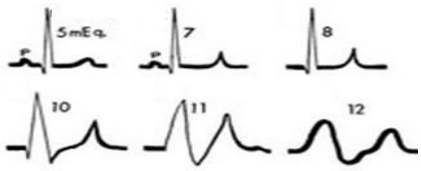
Hypokalemia	
PowerPlan	MSICU Intermittent IV Electrolyte Replacement Orderset
Definition	K+ < 3.5 mEq/L
Etiology	Decreased K+ intake (malnutrition), increased K+ entry into cells (alkalosis → H+ for K+ / insulin / beta adrenergic activity - albuterol, pheo), increased GI losses (diarrhea, vomiting, laxative abuse, copious GT losses), renal losses (diuretics -- loop/thiazide but NOT aldo antagonists, mineralocorticoid excess -- primary hyperaldo, hyperreninemic states [p/w HTN, hyperNa, metabolic alkalosis], Type I/II RTA, Gitelman/Bartter)
Pathophysiology	Low K+ → hyperpolarization of myocytes → lack of inhibition of voltage-gated Na+ channels → ↑ Na+ entry into myocytes and ↑ excitability → cardiac arrhythmias
Clinical Manifestations	(Generally only K+ < 3) -- muscle weakness, fatigue, constipation → ileus, tetany, rhabdo, respiratory muscle failure, EKG changes (ST depression → dec T wave amplitude → U waves) 
Workup	Chem 10, EKG (see below), TTKG: **(urine K+ x plasma osm) / (plasma K+ x urine osm)** - can only use when urine osm > 300. TTKG > 3 i/s/o hypoK suggests aldo excess.
Management	• Mild to moderate (K+ = 3.0-3.5 mEq/L) -- rx underlying d/o, give KCl 1 mEq/kg (max 20 mEq) PO q8-24h OR add KCl to IVF (max conc is 80 mEq/L via PIV). • If severe (K+<2.5 to 3 mEq/L or symptomatic, EKG changes), add KCl to IVF, give KCl 0.5-1 mEq/kg (max 30 mEq) IV x1 -- only in ICU, and should have EKG monitoring during infusion • Also correct Mg2+ if low (25-50 mg/kg IV, max 2g/dose) as hypoMg prevents resolution of hypoK

Hyperkalemia	
PowerPlan	MICU/MSICU/NICU hyperkalemia orderset
Definition	K+ > 5.5 mEq/L (up to 6.5 may be normal in neonates)
Etiology	↑ K+ intake (TPN, IVF, formula), ↑ K+ release from cells (acidosis [K+ efflux allows H+ influx to buffer acidosis], cell lysis [hemolysis, rhabdo, tumor lysis]), ↓ renal excretion (acute or chronic renal failure, hypoaldosteronism [adrenal insufficiency, hyporeninemic hypoAldo, ACE inhibitors -- look for hypoNa and metabolic acidosis], K-sparing diuretics [spironolactone, epelrenone, amiloride, triamterene]), pseudohyperkalemia (hemolyzed blood sample)
Pathogenesis	↑ K+ partially depolarizes cell membrane → inhibits voltage-gated Na+ channels → ↓ Na+ entry → impaired membrane excitability → weakness
Clinical Manifestations	• Muscle weakness (LE > UE) flaccid paralysis, arrhythmias (if K+ > 7) • **EKG changes** (in order of appearance): Tall peaked T wave, shortened QT PR/QRS lengthening "sine wave" QRS VFib 

Hyperkalemia continued on next page →