Abnormal Glucose Handout

Definition of Hyperglycemia
—Mild = fasting blood glucose 120 mg/dl – 200 mg/dl
—Moderate = fasting blood glucose 200 mg/dl – 410 mg/dl
—Severe = fasting blood glucose ≥ 410 mg/dl

Acute Management
—Always send stat serum glucose
—Check for easily identifiable causes e.g. TPN, IVFs, medications, infection, trauma
—Send stat metabolic panel, VBG to check for hypokalemia, renal function, acidosis
—Notify PICU, senior resident, attending, endocrinologist (if applicable)
—Monitor electrolytes, glucose, pH at least HOURLY
—Glucose should not fall more than 40 mg/dl/hr
—Close monitoring of neuro status
—Check again for precipitating causes

Take Home Points
—Severe hyperglycemia >400 mg/dl is a medical emergency requiring immediate evaluation and intervention.
—Glucose, electrolytes and pH must be checked hourly to ensure that glucose is not dropping too quickly, hypokalemia has not developed, and acidosis is resolving.
—Pay close attention to neuro status (HA, drowsiness, change in VS) as cerebral edema is main cause of mortality in DKA.

Definition of Hypoglycemia
—Clinical definition is plasma glucose ≤ 40-45 mg/dl
—Signs/symptoms can occur at glucose levels < 70 mg/dl
—Plasma glucose normally maintained in range of 70-100 mg/dl

Acute Management
—Always send stat serum glucose
—Determine age of patient (newborn?) and check medications
—If no obvious reason for hypoglycemia (normal newborn, exogenous insulin or oral hypoglycemics), draw critical samples BEFORE treatment

Critical Labs

- Glucose
- FFA
- β hydroxybutyrate
- Lactate
- Carnitine, acylcarnitines
- Plasma insulin

- C peptide
- Cortisol
- Growth hormone

—If patient conscious and able to drink, give PO rapidly absorbed carbohydrate
—Initial bolus 2-4 ml/kg D10 administered slowly
—Infusion of dextrose at 6-9 ml/kg/min
—Rate of infusion (mg/kg/min)=% dextrose x 10 x rate of infusion (ml/hr) ÷ (60 x wt in kg)
—Use D10 if peripheral IV (max concentration in PIV)
—Goal is to keep serum glucose between 80-100 mg/dl initially until determine cause of hypoglycemia
—If no IV access, can give glucagon IM or SQ 0.03 mg/kg up to 1 mg
—Check glucose Q 30-60 mins initially until stable

Take Home Points
—Hypoglycemia is a medical emergency requiring immediate evaluation and intervention
—Patients will often have adrenergic response well before CNS manifestations
—Critical labs must be obtained BEFORE therapy in order to help w/diagnosis
—Closely monitor after glucose bolus and/or glucagon to ensure rise of serum glucose and always provide infusion of glucose after initial therapy
—Failure to respond to glucagon indicates something other than hyperinsulinism (think about less common things on differential)