HYPOGLYCEMIA AND GLUCOSE MANAGEMENT

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WHAT IS HYPOGLYCEMIA?
- In a person without diabetes, a random blood glucose level is usually between 70-140 mg/dL; fasting values are between 70 and 100 mg/dL
- Hypoglycemia occurs when blood glucose levels drop to abnormally low levels
- Glucose is the body’s main energy/fuel source
- American Diabetes Association (ADA) defines hypoglycemia or low blood sugar as BG < 70 mg/dL
- Hypoglycemia may also be referred to as an insulin reaction, reaction, or a low
- Once BG is < 70 mg/dL, symptoms of hypoglycemia may develop
- In people without diabetes, BG values between 60 and 70 mg/dL are not uncommon
WHAT CAUSES HYPOGLYCEMIA?
- Skipping meals or eating late
- Exercise
- Injecting too much insulin or the wrong type of insulin
- Oral diabetes medications especially when used with insulin (i.e., glyburide, glipizide, glimeperide)
- Injectable diabetes medications when combined with insulin (i.e., Byetta, Victoza, Trulicity, Bydureon)
- Taking bath, shower, or going in a hot tub shortly after injecting insulin
- Illnesses, especially if vomiting and diarrhea present
- Stress
- Drinking alcohol

WHAT ARE SYMPTOMS OF HYPOGLYCEMIA?
- Sugar (glucose) to your body and brain is analogous to the gas that fuels your car
- Without an adequate supply of glucose, your body and brain cannot function properly
- When BG levels drop too low, the body puts out adrenaline, known as the “fight or flight” hormone and patients may experience hunger, shakiness, weakness, heart racing/pounding, and sweating
- Headaches, confusion, sleepiness, mood/behavior changes, and vision changes may also occur
- Severe hypoglycemia can lead to loss of consciousness and seizures

WHAT IS HYPOGLYCEMIC UNAWARENESS?
- When a person has low blood sugar but has no symptoms/warning of hypoglycemia
- Young children may not recognize low blood sugar symptoms
- Some medications may mask body’s response to low BG
- Long duration of diabetes may blunt body’s response to hypoglycemia
- If BG drops gradually symptoms may not be as pronounced
- If BG control is very tight or in patients with frequent hypoglycemia, symptoms of lows may not occur due to lack of adrenaline response
- Avoiding lows for 2-3 weeks and letting BG run higher may help restore symptoms of low blood sugars
- CGM/Bionic pancreas very helpful tool here

WHAT IS THE BEST STRATEGY TO TREAT HYPOGLYCEMIA?
- Treat early symptoms with 15 – 20 g of a fast-acting form of carbohydrate such as candy, fruit juice, regular (not diet) soda, glucose tablets, glucose gel
- Foods with fat and protein not good as initial treatment because protein and fat will slow body’s absorption of sugar
- “Rule of 15”: 15 g of carbs, check again in 15 minutes, if BG still < 70, repeat 15 g of carbs and recheck. Again in 15 minutes, repeat until BG > 70.
- Small children may need less carbs than heavy adult to treat low
- If BG severely low (<50 mg/dL), double number of carbs used to treat
- Once BG has come up, good idea to eat snack or meal to stabilize BG
GLUCAGON IS A HORMONE MADE IN THE PANCREAS ALONG WITH INSULIN
GLUCAGON ACTS TO RAISE BLOOD SUGAR LEVELS
GLUCAGON INJECTIONS ARE USED TO TREAT LOWS IN A PERSON WHO IS UNCONSCIOUS, UNRESPONSIVE, OR UNABLE TO TAKE IN CARBS BY MOUTH
NEVER PUT ANYTHING INTO A PERSON’S MOUTH WHEN UNRESPONSIVE
CALL 911 IF GLUCAGON IS ADMINISTERED

WHAT IS THE BEST STRATEGY TO TREAT SEVERE HYPOGLYCEMIA?

GLUCAGON APP FOR SMART PHONES GREAT TEACHING TOOL
MAKE SURE FAMILY MEMBERS, FRIENDS, ROOMMATES, AND CO-WORKERS KNOW YOU HAVE DIABETES, KNOW WHERE TO FIND GLUCAGON KIT AND HOW TO USE IT
LOW DOSES OF GLUCAGON GIVEN IN AN INSULIN SYRINGE CAN BE USED IN A PERSON WHO IS UNABLE TO KEEP FOOD DOWN USING ONE UNIT PER YEAR OF AGE UP TO AGE 15 YEARS; DOSE IN ADULTS IS 15 UNITS (MAY AVOID ER TRIP)

WHAT CAN I DO TO PREVENT HYPOGLYCEMIA?

PREVENTING LOWS HELPS MAINTAIN ADEQUATE LEVELS OF EPINEPHRINE, GLUCAGON, AND OTHER HORMONES THAT PROTECT AGAINST HYPOGLYCEMIA
LET BG RUN HIGHER FOR 48-72 HOURS AFTER A SEVERE LOW TO REPLENISH GLYCOGEN STORES IN THE LIVER
CARRY RAPID-ACTING CARBS AT ALL TIMES; EAT REGULARLY THROUGHOUT THE DAY
ADJUST INSULIN DOSES FOR EXERCISE AND ILLNESS
TEST BG LEVELS OFTEN AND/OR USE CGM, ESPECIALLY IN THE SETTING OF HYPOGLYCEMIC UNAWARENESS
BE CONSERVATIVE WITH INSULIN GIVEN AT BEDTIME
“BIONIC” PANCREAS HAS THE ABILITY TO SUSPEND INSULIN DELIVERY TO AVOID HYPOGLYCEMIA

WHAT IS THE BURDEN OF HYPOGLYCEMIA?

HYPOGLYCEMIA LEADS TO ALMOST 100,000 ER VISITS IN THE UNITED STATES EVERY YEAR
ELDERLY WITH DIABETES OVER AGE 80 AT HIGHEST RISK
EVERY YEAR, 1/49 INSULIN-TREATED SENIORS >65 VISIT ER BECAUSE OF HYPOGLYCEMIA; 1/8 IN VERY ELDERLY OVER AGE 80
OVER A 5 YEAR PERIOD, ER VISITS FOR HYPOGLYCEMIA COST THE US HEALTHCARE SYSTEM AN ESTIMATED $600 MILLION, NOT INCLUDING HOSPITALIZATIONS
SUMMARY

- HYPOGLYCEMIA IS PREVENTABLE!
- KNOWLEDGE IS POWER!
- EDUCATE YOURSELF AND YOUR FAMILY AND FRIENDS ABOUT HYPOGLYCEMIA TO AVOID A TRUE HYPOGLYCEMIC EMERGENCY

THANKS FOR YOUR ATTENTION!