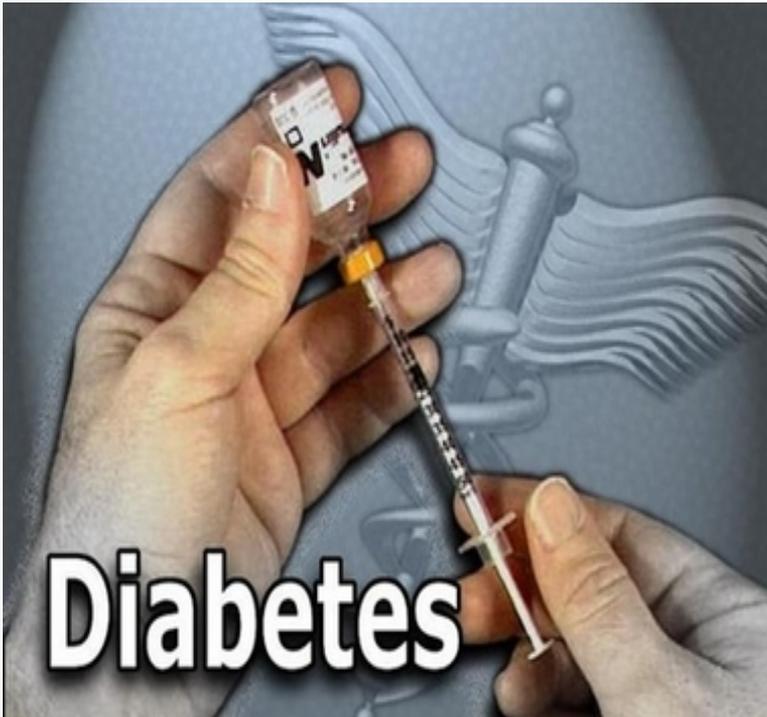




SEVIER SCHOOL DISTRICT
HEALTH SERVICES TRAINING MODULE

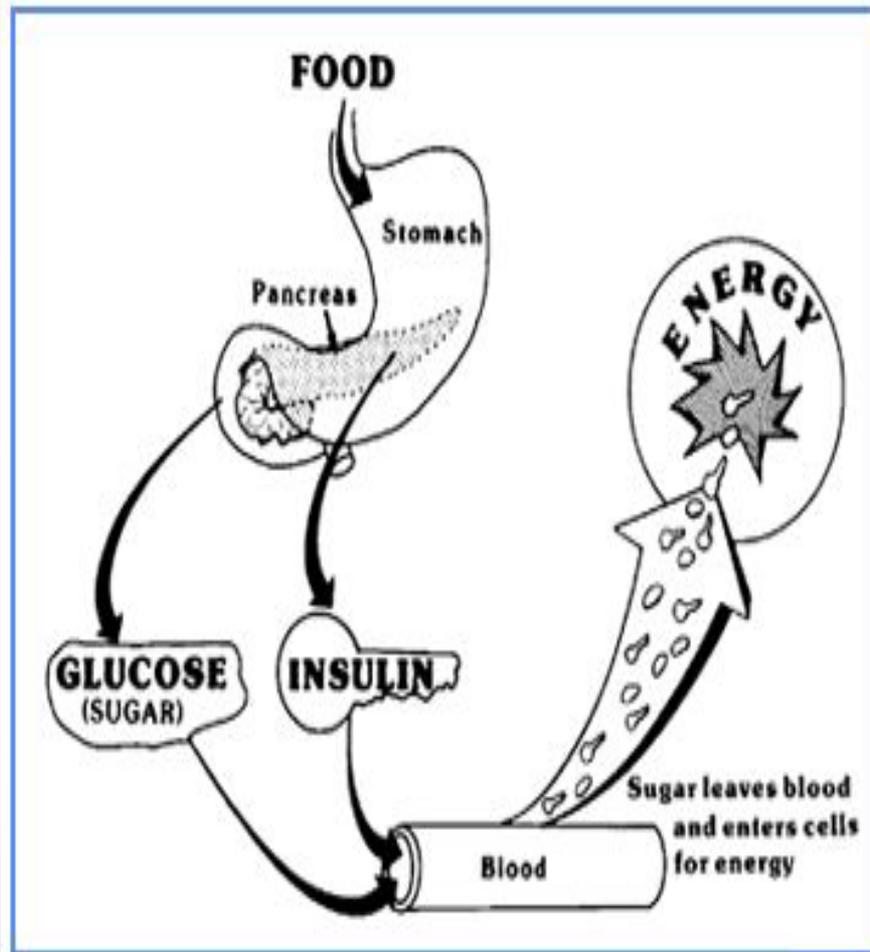
DIABETES BASICS

Today you will learn about



- Glucose Metabolism
- Diabetes
- Hyperglycemia
- Hypoglycemia
- Glucagon Administration
- Monitoring Blood Glucose
- Counting Carbohydrates
- Insulin Administration

Glucose metabolism



ENERGY is required for organs to function in the body

GLUCOSE supplies most of those energy requirements

FOOD provides carbohydrates that are broken down into glucose and enter the blood stream

BRAIN , KIDNEY & LIVER CELLS

get glucose through diffusion

INSULIN, secreted from the Pancreas, enters the blood stream, connect to cells, and like a key, allows glucose to enter in **WITHOUT INSULIN** glucose cannot be properly metabolized

Diabetes is

A condition in which the body does not produce insulin, or
The insulin produced is not effective in getting glucose into the cells



WITHOUT INSULIN

- Glucose builds up in the blood and over flows into the urine
- Body does not get the glucose needed for energy
- Begins to burn fat and even muscle for energy
- Leads to a condition called ketoacidosis

Ketoacidosis is

A build up of ketones in the blood which spills into the urine and is produced from the metabolism of fat for energy

TEST FOR KETONES CAN BE DONE WHEN

- Blood glucose is above 300 mg/dL
- Nauseated, vomiting or experiencing abdominal pain
- Sick, tired, flushed, confused or in a fog
- Having a hard time breathing with a fruity smelling breath



Can lead to severe electrolyte imbalance, cerebral edema, coma & even death

Insulin is the key



Types of Insulin Based On

- Patient's response to insulin
- Lifestyle choices
- Willingness to give multiple injections per day
- How frequently patient is willing to test blood glucose
- The age of the patient
- Goals for blood glucose management

Insulin Classifications



INTERMEDIATE-ACTING LONG-ACTING RAPID-ACTING SHORT-ACTING

Target range of blood glucose



Young Child up to 7 yrs

100-200

School Age Child 7-11 yrs

80-160

Adolescent 12-Adult

70-150

Follow the Individualized Health Care Plan

High Blood Glucose → HYPERGLYCEMIA



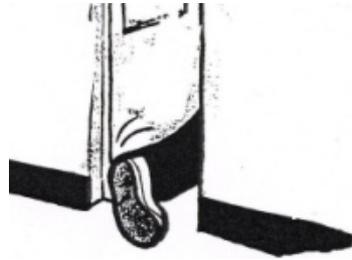
FACTORS TO CONSIDER

- May have forgotten to take insulin
- May not have taken enough insulin
- May have eaten more than planned
- May be inactive
- May be ill or under stress

Signs & Symptoms of Hyperglycemia



Extreme Thirst



Frequent Urination



Dry Skin



Tiredness Fatigue



Inability to Concentrate

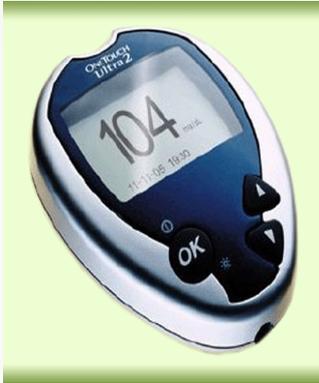


Abdominal Pain



Nausea & Vomiting

Treatment for Hyperglycemia



Check
blood
glucose



May need
insulin



Provide
water



Provide
bathroom
privileges



Exercise
can reduce.
Do not
exercise if
above 300

Call Parent if above 300
Follow the Individualized Health Care Plan

Hypoglycemia



Blood glucose
below target range

Too much insulin given

Not enough food eaten

Exercise

THIS CONDITION MUST BE TREATED IMMEDIATELY!

Exercise lowers blood glucose



BECAUSE

- Body uses glucose more efficiently
- Insulin is more effective at lowering glucose

RECESS, PE, SPORTS

**May need a high carbohydrate snack
to reduce the risk
of hypoglycemia**

Signs & Symptoms of Hypoglycemia



ANXIOUS



**FAST
HEARTBEAT**



SWEATING



HUNGRY



**BLURRY
VISION**



DIZZY



HEADACHE



**WEAKNESS
OR FATIGUE**



IRRITABLE



DISORIENTED

NEVER send a student out of the classroom alone

Treatment for Hypoglycemia



When possible
Monitor glucose



Give one choice of fast acting sugar



Follow with milk & protein
or lunch within 10-15 min

**You should see a response within 15-20 minutes.
Repeat in 10-15 minutes if symptoms are still present.**

Treating severe hypoglycemia

A LIFE THREATENING EMERGENCY!

Unable to take instruction, cannot swallow, seizing or unconscious



Call 911



Inject Glucagon

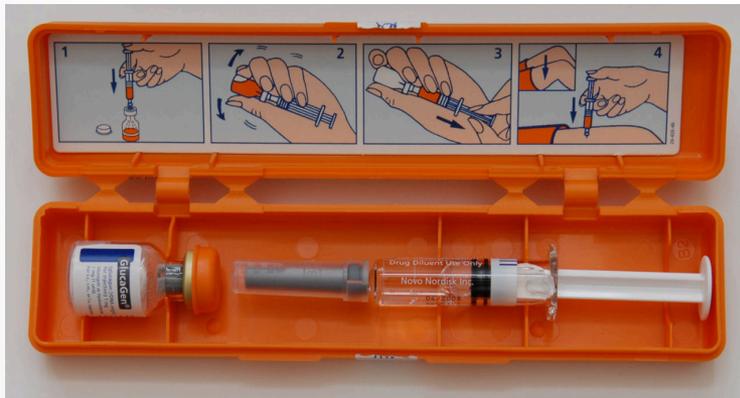


Turn on side

Glucagon Emergency KIT

CONTAINS

- Instructions
- Vial of powdered glucagon
- Syringe of sterile water



Novo Nordisk® GlucoGen® HypoKit™

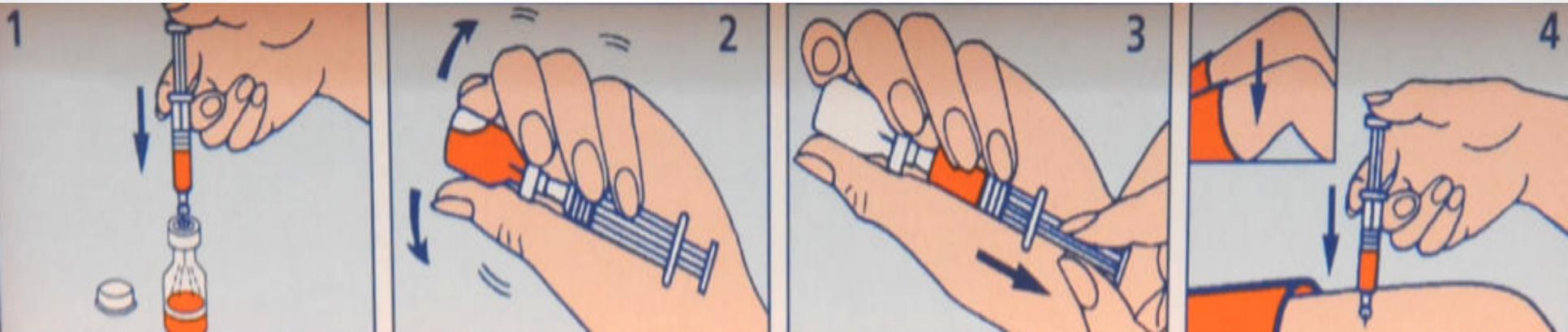


Lilly® Emergency Kit

Record expiration date on a calendar for renewal date

Preparation & Injection of Glucagon

*Remove flip top seal from vial containing glucagon powder.
Remove needle protector from syringe containing sterile water.*



Inject liquid from syringe into the vial.

Mix solution with a gentle back and forth motion

Withdraw solution from vial with syringe

Insert needle straight into the arm or thigh muscle, inject the fluid, then withdraw and apply light pressure to the site.



Place the vial & syringe in the kit & give to EMT.

Monitoring Blood Glucose

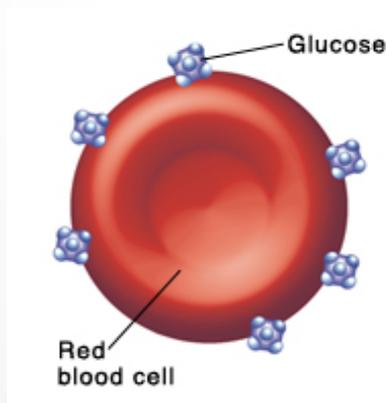


Maintaining target levels of glucose in the blood stream



Glucometer Check

Provides the blood glucose level in the moment that it is taken.



Hemoglobin A1c

Provides an average blood glucose level over 60-90 days. A healthy A1c target will be below 8%.

Times for Monitoring

- Before meals & snacks
- At bedtime & upon rising
- With symptoms of hyper or hypoglycemia
- Before, during and/or after exercise
- During periods of high stress or illness
- With a change in diabetes management



Follow the Individualized Health Care Plan

Items needed

- Meter
- Test strips
- Lancing Device
- New Lancet
- Sharps container



Blood Glucose Meters



Accu-Chek
Aviva



One Touch
UltraMini



One Touch
Ultra 2



Accu-Chek
Compact



Contour



Freestyle
Lite

To get an accurate reading



COMPARE THE CODES

- Compare code number on meter display with code on test strip vial.
- If numbers match testing can begin.
- If not instructions are provided to get the number on the meter to match the test strip.

Some meters do not require this step

Checking Blood Glucose



Wash hands



Insert a test strip into the meter



Prick the outside edge of the finger



Apply blood to the test strip



Wait for the reading. Record the results. Dispose of the lancet & test strip.

If you are assisting with this procedure, wear gloves & wipe the finger with alcohol before pricking

Meal Planning involves



Nutrition Facts

Serving Size: 1 package (3 oz) (85g)

Amount Per Serving

Total Carbohydrate 70.38 g



GOOD NUTRITION

BALANCED DIET

COUNTING CARBS

INSULIN FOR CARBS

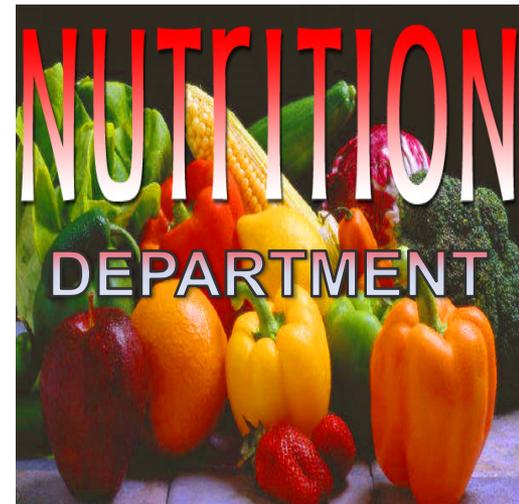
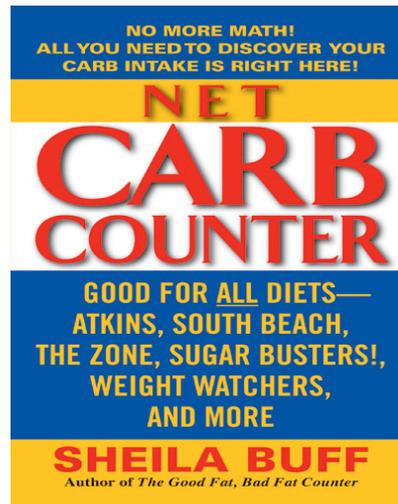
Fast Foods



Carbohydrates

- Foods that contain sugar or starch
- Grams listed on food labels, in books, and through the Nutrition Department

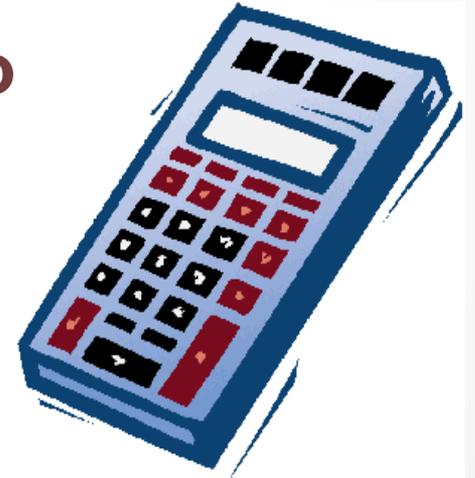
Nutrition Facts		
Serving Size: 1 package (3 oz) (85g)		
Amount Per Serving		
Calories	348	Calories from Fat 49
		% Daily Value*
Total Fat	5.44 g	8%
Saturated Fat	1.73 g	9%
Trans Fat		
Cholesterol	219.3 mg	73%
Sodium	238.85 mg	10%
Potassium	459 mg	13%
Total Carbohydrate	70.38 g	23%
Dietary Fiber	0 g	0%
Sugars		
Sugar Alcohols		
Protein	5.86 g	
Vitamin A	184.45 IU	4%
Vitamin C	0.34 mg	1%
Calcium	193.8 mg	19%
Iron	1.64 mg	9%



Carb Counting

- Decide **what & how many carbohydrates** they will be eating for the meal and snack
- Know the **Insulin to Carb Ratio** ordered by the physician

EXAMPLE
1 unit of insulin for
every 15 carbs (1:15)



Insulin at School



Before meals & snacks



For high blood glucose
above target range

Follow the Individualized Health Care Plan

Rapid-Acting Insulin



RAPID-ACTING

Covers insulin needs for meals eaten at the same time as the injection

TYPE	ONSET	PEAK	DURATION
HUMALOG	15-30 minutes	30-90 minutes	3-5 hours
NOVOLOG	10-20 minutes	40-50 minutes	3-5 hours

Insulin Delivery Systems



Insulin Syringe

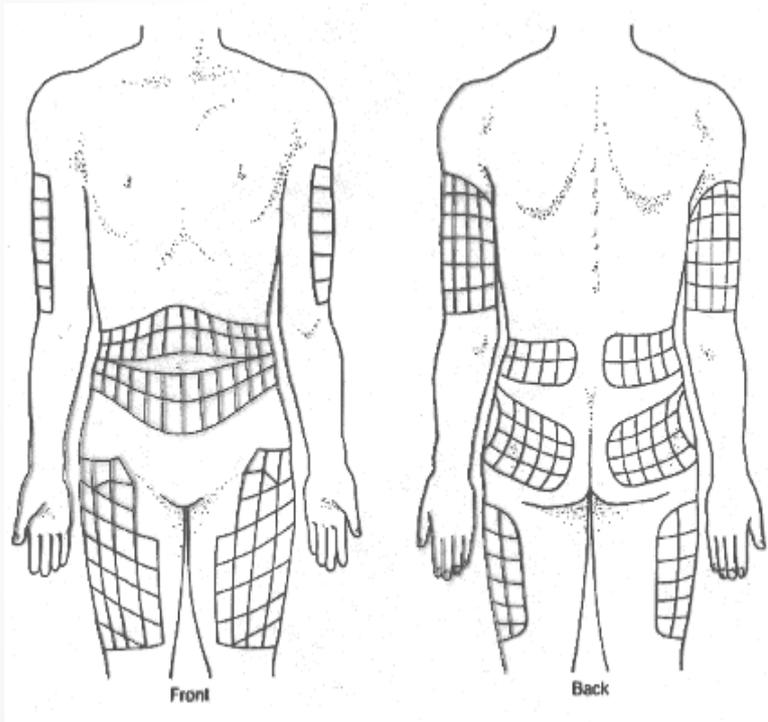


Insulin Pen



Insulin Pump

Injection Sites



Most common sites used at school will be the arms & stomach

Rotate Injection sites to decrease the risk of tissue damage

Supplies needed when using the insulin syringe or pen

Gloves



Insulin and syringe



Sharps Container



Alcohol Wipes



OR

Insulin Pen and Needle Tip



Using the Insulin Syringe



Wash Hands



Wipe rubber top with alcohol



Remove cap from syringe; pull down plunger to units needed



Inject this air into the insulin vial to maintain pressure



Turn vial upside down and withdraw insulin needed



Wipe chosen site with alcohol



Inject insulin at a 90° angle
Count to 5 and withdraw



Dispose of the syringe & needle in a sharps container

Double check units. An overdose of insulin could result in hypoglycemia.

Using an Insulin Pen



1

Wash Hands



2

Place the needle tip on the insulin pen



Remove the protective cap



3

Prime the needle by dialing 4 units



Watch for insulin drop

Press the injection button



4

Now dial the units needed for injection



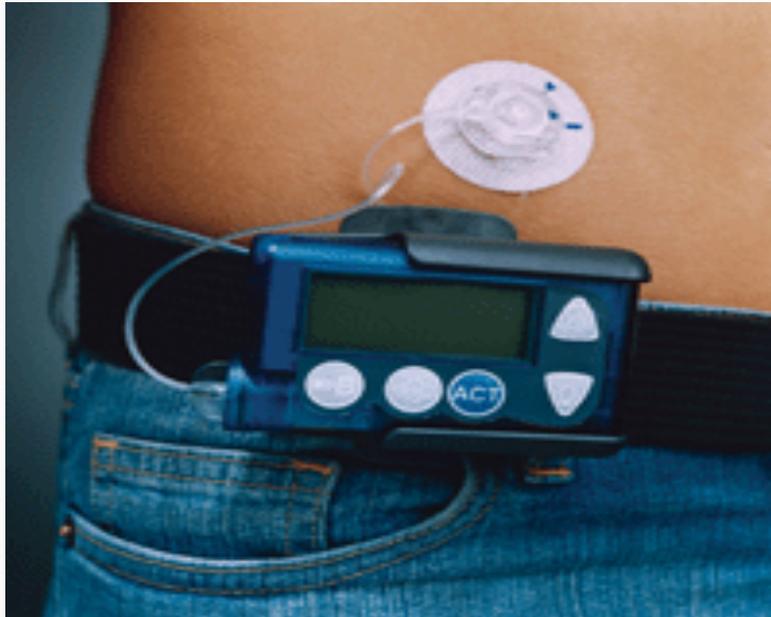
5

Wipe with alcohol then inject Insulin at a 90 ° angle. Hold for 5 seconds and then withdraw.



Discard of Needle tip

Using the Insulin Pump



STEPS FOR INJECTION

- Blood glucose is entered into the pump
- Carbohydrate grams are entered into the pump
- The pump injects the correct insulin into the fatty tissue

A Balancing Act



- Monitoring blood glucose
- Counting carbohydrates
- Getting the right dose of insulin
- Considering exercise, stress and illness
- Being prepared for an emergency
- Documenting

References

- “Diabetes at School” Utah Insulin Delegation Task Force
- “Safe at School” American Diabetes Association