

Insulin Teaching and Administration for Newly Diagnosed Adolescent Patients

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Overview of Diabetes



Definitions

Fasting Plasma Glucose (FPG)- also known as fasting blood sugar, a test used to determine the level of glucose in your blood (“Diabetes Care”, n.d.).

OGTT – known as oral glucose tolerance test, a test used to determine the level of glucose in your blood both after fasting and drinking a glucose rich beverage (“Diabetes Care”, n.d.).

A1C test- measures average blood glucose level over 3 months (“Diabetes Care”, n.d.).

IDDM- insulin dependant diabetes mellitus, known as type 1 diabetes

NIDDM- non insulin dependant diabetes mellitus, known as type 2 diabetes (“Diabetes Care”, n.d.).

Definitions (cont'd)

Glucose- sugar, main source of energy for cells (“Diabetes Care”, n.d.).

Carbohydrate- foods that affect blood sugar such as bread, rice, pasta, potatoes, corn, fruit, and milk products (“Diabetes Care”, n.d.).

Pancrease- the organ that produces insulin (“Diabetes Care”, n.d.).

Insulin- a hormone secreted by the pancrease to aid in glucose management (“Diabetes Care”, n.d.).

Beta cells- the cells in the pancrease responsible for producing insulin (“Diabetes Care”, n.d.).

Keto Acidosis- life threatening diabetic coma (“Diabetes Care”, n.d.).

Sliding scale- scale used to determine how much insulin to admisnister.

Diabetes Facts

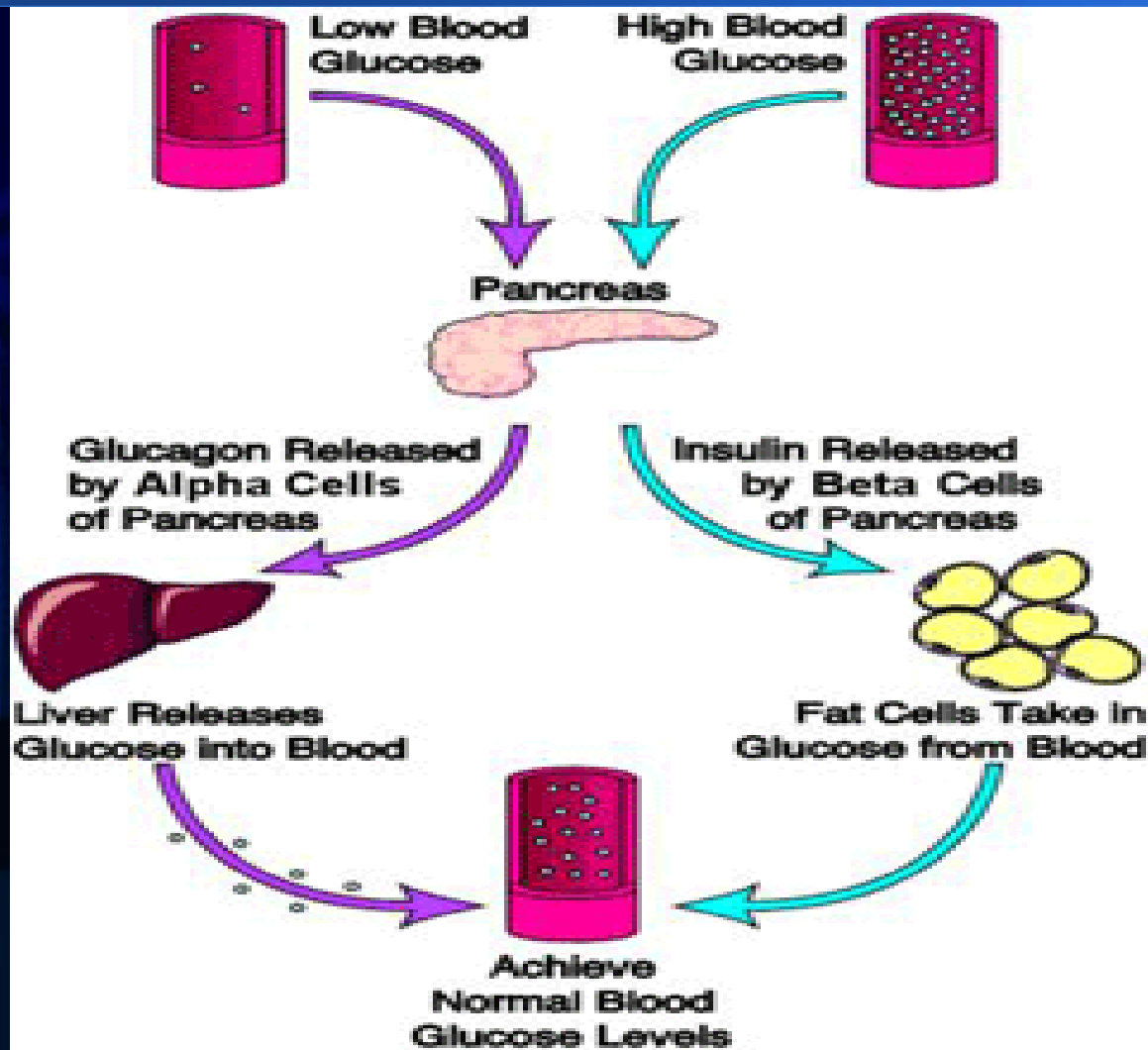
Most rapidly growing and widely recognized chronic disease (“Diabetes,” n.d.).

Leading cause of new blindness, kidney disease, amputation, and death in the United States (“Diabetes,” n.d.).

Normal Pathway

- **Carbohydrates are digested and turned into glucose**
- **Glucose is then used by the cells for energy**
- **Insulin is secreted by the beta cells in the pancreas to transfer glucose into the cell**

Normal Blood glucose response



DIABETES

DIABETES

What Is Diabetes?

Inability for the body to convert glucose into energy (“Diabetes Care,” n.d.).

Types of Diabetes

Type 1: (Insulin dependent diabetes)

the pancreas does not produce enough insulin resulting in lack of energy to cells (“National Diabetes Information Clearinghouse (NDIC),” n.d.).

Type2: (non-insulin dependent diabetes)

insulin produced is defective and cannot push the glucose into the cell resulting in lack of energy to cells (“National Diabetes Information Clearinghouse (NDIC),” n.d.).

Symptoms of Diabetes

Type 1:

- increased thirst and urination, constant hunger, weight loss, blurred vision, and **extreme fatigue** (“National Diabetes Information Clearinghouse (NDIC),” n.d.).
- If not treated a person can go into ketoacidosis (“National Diabetes Information Clearinghouse (NDIC),” n.d.).
- No cure/prevention except pancrease transplant. (“National Diabetes Information Clearinghouse (NDIC),” n.d.)
- Can be controlled by keeping blood glucose levels at normal range by means of diet (“National Diabetes Information Clearinghouse (NDIC),” n.d.)

Symptoms of Diabetes

Type 2:

- Fatigue, frequent urination, increased thirst and hunger, weight loss, blurred vision, **slow healing wounds or sores, numbness and tingling in hands and or feet* (“National Diabetes Information Clearinghouse (NDIC),” n.d.).
- Can be controlled/prevented by losing small amounts of weight, healthier food choices, being physically active at least **30 minutes a day** (“National Diabetes Information Clearinghouse (NDIC),” n.d.).

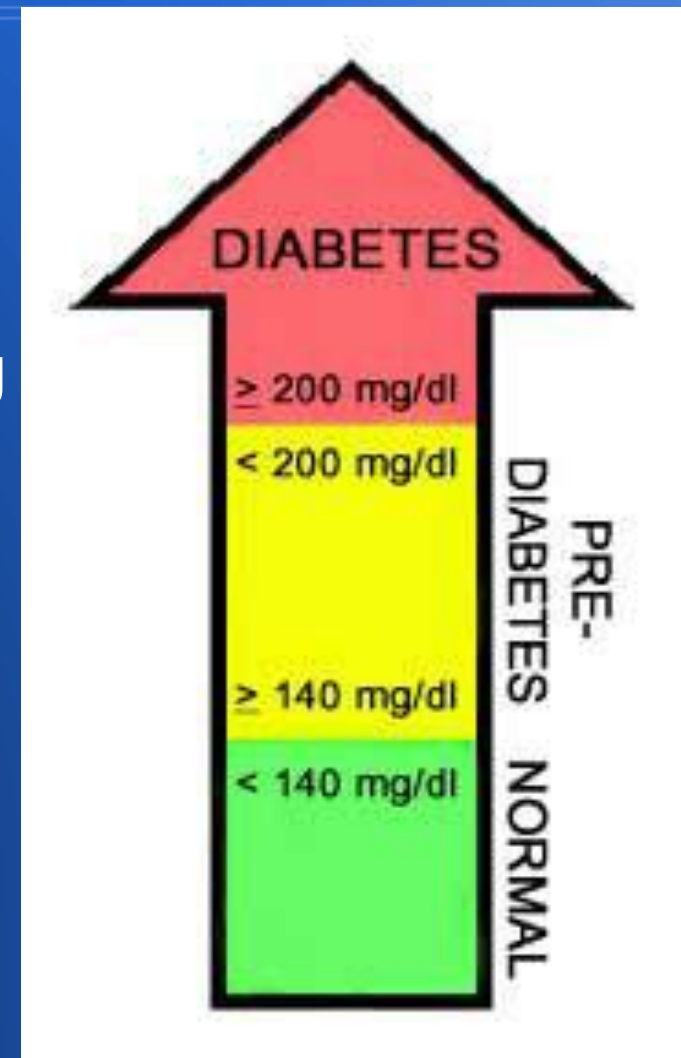
How is Diabetes Diagnosed?

FPG TEST: (fasting plasma glucose tolerance test)

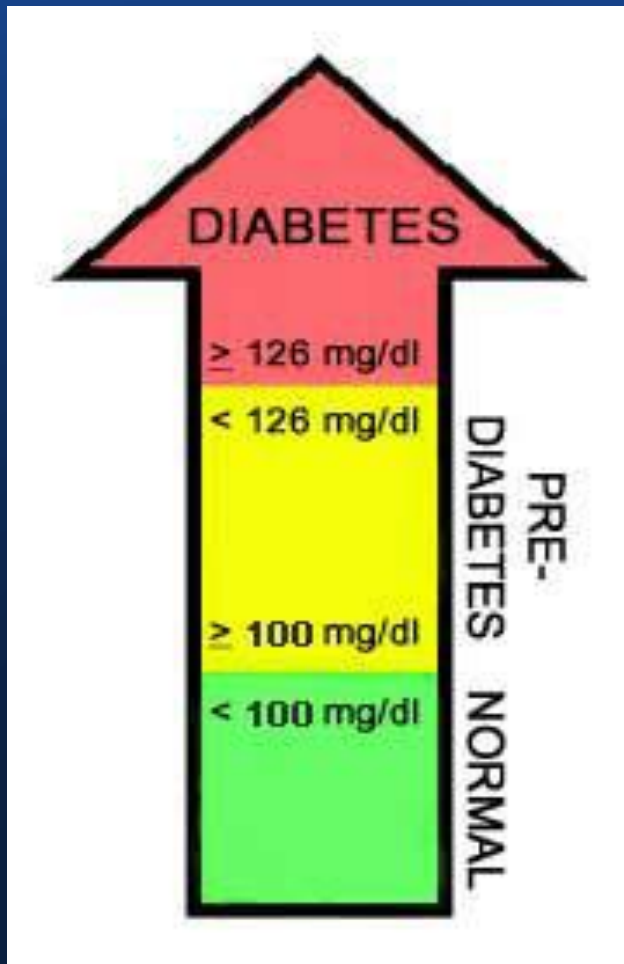
results are read after 8 hours of not eating and if the levels are between 100 – 125 mg/dl you are considered pre-diabetic (“Diabetes,” n.d.)

If the results are greater than or equal to 126 mg/dl you are then classified as diabetic (“Diabetes,” n.d.).

Less than 140 mg/dl is normal range for a fasting blood sugar (“Diabetes,” n.d.).



How is Diabetes Diagnosed?



OGTT: (Oral Glucose tolerance test)

results are read after 8 hours of fasting and then 2 hours after drinking a glucose rich beverage. If your levels are between 140 – 199 mg/dl then you are considered pre-diabetic (“Diabetes,” n.d.).

If the results are greater than 200 mg/dl you are then classified as diabetic (“Diabetes,” n.d.).

Less than 100 mg/dl is normal range (“Diabetes,” n.d.).

Who is at risk for Diabetes Type 2

According to the department of health the “at risks” are:

- Age greater than age 45
- Overweight
- Physical inactivity
- Family background that is American Indian, African American, Hispanic/Latino, Asian American, or Pacific Islander
- Parent or sibling with diabetes
- High blood pressure and/ or abnormal high cholesterol levels
- Having had a baby that weighed more than 9 pounds or having had gestational diabetes
- History of polycystic ovary disease (PCOS)

How is Diabetes managed?

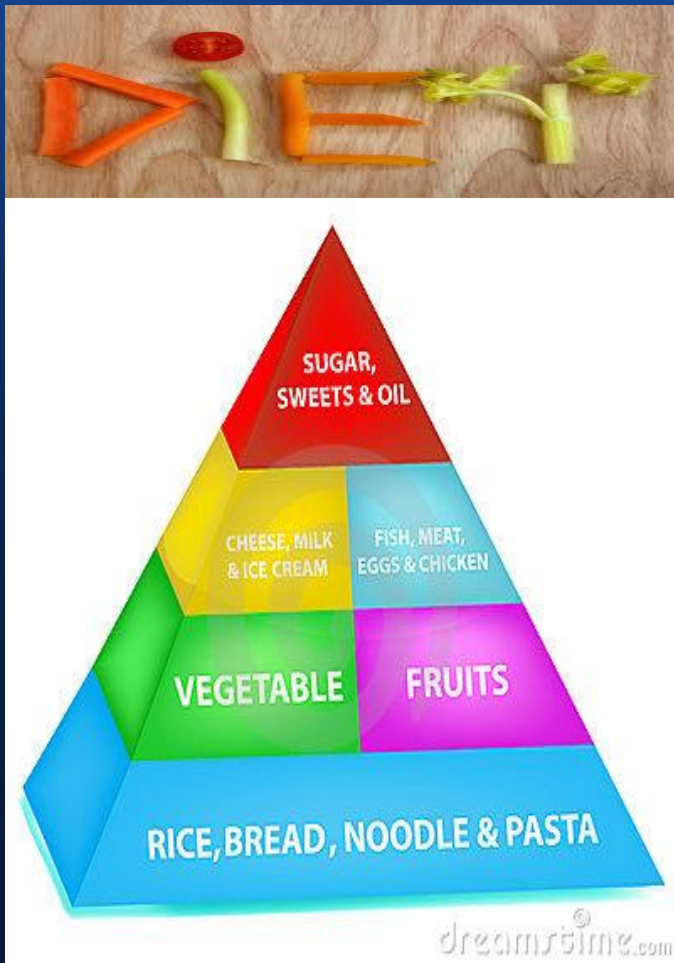


How is Diabetes managed?



Exercise

How is Diabetes managed?



Healthier food
choices

How is Diabetes managed?



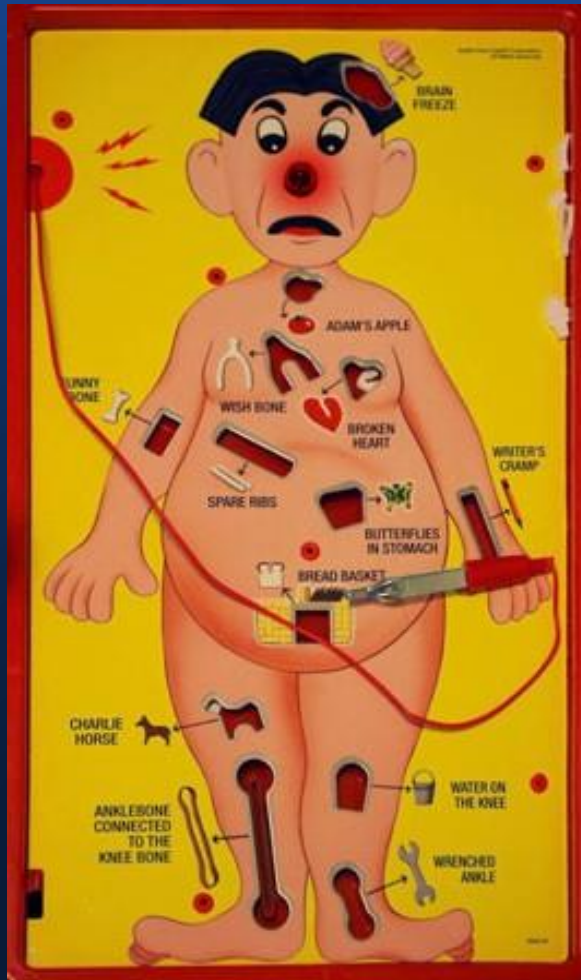
Take your
medication on
time.

How is Diabetes managed?



Quit smoking

How is Diabetes managed?



Follow up with your cholesterol levels and your eye, foot, and kidney doctors.

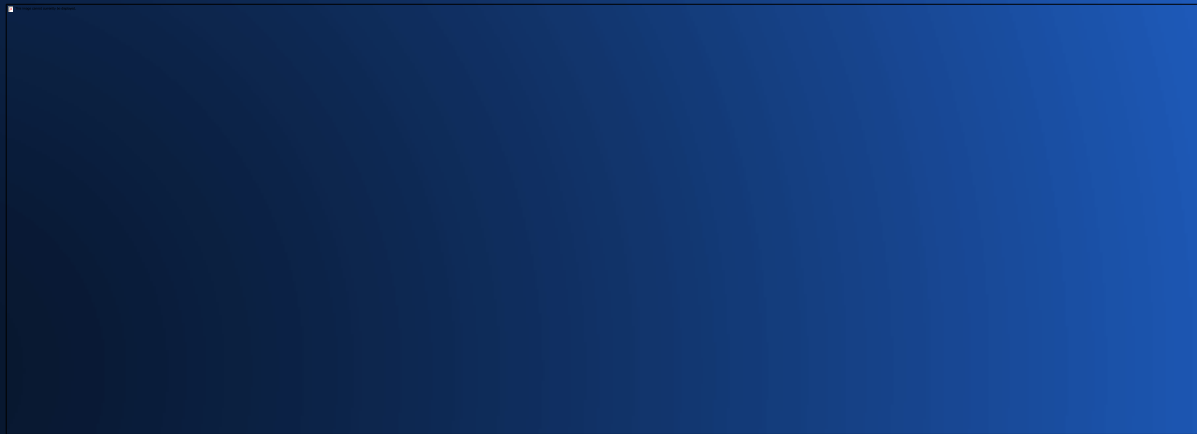
How is Diabetes managed?



A1C testing



Your doctor will draw your blood and do an A1C test which will tell him how well your insulin was controlled over the prior 3 months (“Diabetes,” n.d.)



Insulin Teaching and Administration

What is Insulin Made Of?

- Until 1980's insulin was extracted from the pancreas of pigs and cattle (“About Insulin,” n.d).
- New DNA technology is used:
 - human insulin transferred into bacterial cells (“About Insulin,” n.d).
 - these cells multiply, plenty of insulin produced (“About Insulin,” n.d).

Insulin Types

Injectable:

syringes



flexi-pen



Oral:

tablets



(“National Diabetes Information Clearinghouse (NDIC),” n.d.)

Insulin Injection Types

- Rapid Acting
- Short Acting
- Intermediate Acting
- Long Acting
- Premixed

(“National Diabetes Information Clearinghouse (NDIC),” n.d.)

Injection Types and Duration



(“National Diabetes Information Clearinghouse (NDIC),” n.d.)

Insulin maintenance

Storage:

- * if stored in refrigerator unopened bottles are good until expiration (“Diabetes Learning Center,” n.d.).
- *if stored in refrigerator opened bottles should be discarded one month after opening (“Diabetes Learning Center,” n.d.).
- *if stored at room temperature should be discarded one month after opening (“Diabetes Learning Center,” n.d.).
- *protect insulin from extreme hot or cold temperature (“Diabetes Learning Center,” n.d.).

Appearance:

- *Discard insulin if it has an unusual appearance and you do not feel the effect of the medication working (“Diabetes Learning Center,” n.d.).
- *Discard insulin if it goes from naturally clear to cloudy or originally cloudy with development of clumps (“Diabetes Learning Center,” n.d.).

Insulin Syringe

Chose a syringe barrel based on dose

Use a 1 ml syring for injecting 51-100 units (calibration marked at every 1 unit)

Use a ½ ml syring for injecting 31-50 units (calibration marked at every 1 unit)

Use a 3/10 ml syring for injecting 30 units or less (calibration marked at every half unit)

Chose appropriate needle size (for both pen and needle syringe):

6mm needle for people with very little subcutaneous fat

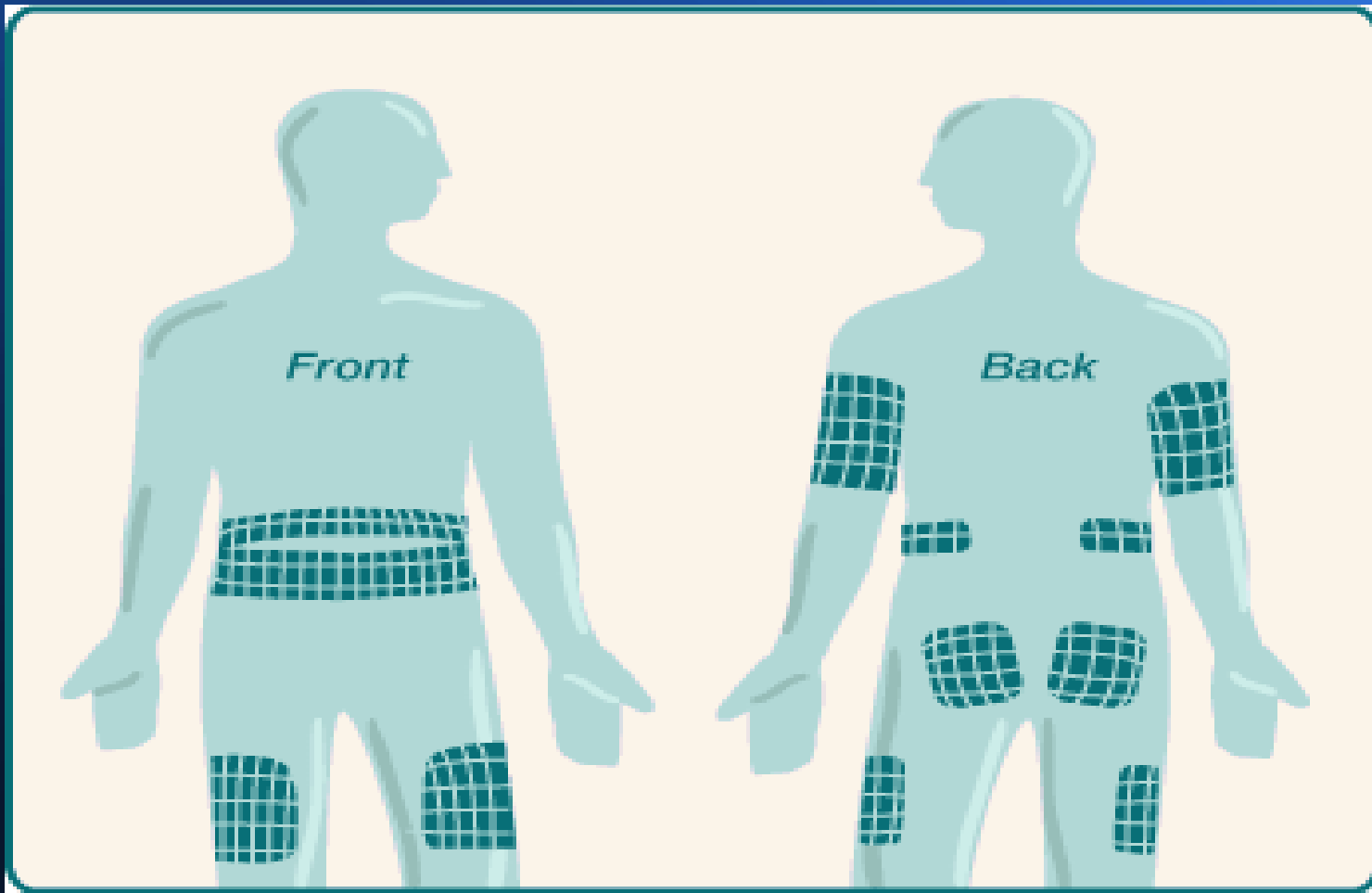
8mm needle for people with more subcutaneous fat

("Diabetes Learning Center," n.d.).

Injection Sites

- **Chose an injection site that is easy to reach** ("Diabetes Learning Center," n.d.).
- **Make sure to rotate the sites to reduce hardness and/ or pain at the site** ("Diabetes Learning Center," n.d.).
- **Never reuse a syringe** ("Diabetes Learning Center," n.d.).

Injection Sites



Using glucometer

- **Use alcohol swab to clean finger**
- **Use lancet to stick finger**
- **Use glucose monitoring machine provided by your physician to determine the amount of insulin to administer.**
- **Use sliding scale chart provided by your physician to determine the amount to insulin to administer.**

Sliding Scale Example

Blood Sugar (mg/dl)	Low Dose Scale	Moderate Dose Scale	High Dose Scale
<70	Initiate Hypoglycemia Protocol	Initiate Hypoglycemia Protocol	Initiate Hypoglycemia Protocol
70-130	0 units	0 units	0 units
131-180	2 units	4 units	8 units
181-240	4 units	8 units	12 units
241-300	6 units	10 units	16 units
301-350	8 units	12 units	20 units
351-400	10 units	16 units	24 units
>400	12 units and call MD	20 units and call MD	28 units and call MD

Insulin Injection Technique

- **Inspect your insulin bottle** ("How To Give An Insulin Injection," n.d.).
- **Wash hands with soap and water** ("How To Give An Insulin Injection," n.d.).
- **Roll insulin bottles around between the palms of your hands** ("How To Give An Insulin Injection," n.d.).
- **DO NOT SHAKE INSULIN BOTTLES** because you can **destroy the molecules and decrease the effect of the insulin** ("How To Give An Insulin Injection," n.d.).
- **Pull desired amount of insulin as per your sliding scale** ("How To Give An Insulin Injection," n.d.).

Insulin Injection Technique

- **Chose your injection site from the diagram** ("How To Give An Insulin Injection," n.d.).
- **Clean injection site in a circular movement** ("How To Give An Insulin Injection," n.d.).
- **Take skin between your forefinger and thumb** ("How To Give An Insulin Injection," n.d.).
- **Gently pull skin up** ("How To Give An Insulin Injection," n.d.).

Insulin Injection Technique

USING A STANDARD SYRINGE:

- **Inject insulin at a 90 degree angle, if you are thin a 45 degree angle is preferred** ("How To Give An Insulin Injection," n.d.).
- **Recap your needle and discard safety needle container provided** ("How To Give An Insulin Injection," n.d.).
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Insulin Injection Technique

USING AN INSULIN PEN:

- **Screw on needle cap tightly** ("IOH - How to Inject Insulin (syringe or insulin pen)," n.d.).
- **Dial pen to two units and expel to insure that pen is working** ("IOH - How to Inject Insulin (syringe or insulin pen)," n.d.).
- **Dial pen to desired insulin dose** ("IOH - How to Inject Insulin (syringe or insulin pen)," n.d.).
- **Holding pen in hand with thumb on top, inject/depress needle to skin at a 90 degree angle** ("IOH - How to Inject Insulin (syringe or insulin pen)," n.d.).

Insulin Injection Technique

USING AN INSULIN PEN (cont'd):

- **Remove needle by pulling straight up** ("IOH - How to Inject Insulin (syringe or insulin pen)," n.d.).
- **Twist off tip and discard into sharps container** ("IOH - How to Inject Insulin (syringe or insulin pen)," n.d.).

Insulin Injection Technique



**REUSE A
NEEDLE!!!!**

Management and Support



Management of Diabetes

- It's important to follow your glucose levels and insulin injections as scheduled and prescribed by your doctor.
- Non compliance can result in several illnesses resulting in and not limited to diabetic coma and limb amputations.



Diabetes Support

- **You and/ or your family may experience mental and emotional struggles with new onset of diabetes ("Diabetes Spectrum," n.d.).**
- **This is not uncommon.**
- **Your family is your biggest support at this time ("Diabetes Spectrum," n.d.).**
- **Families with diabetes tend to be more stressed because of medication confusion and goals ("Diabetes Spectrum," n.d.).**

Diabetes Support

- **Both you and your family can get support from family outside the home, schools, and clinics.** ("Diabetes Spectrum," n.d.).
- **Many different organizations are available for help: Team Diabetes and many more which can be found on the American Diabetic Association ("National Diabetes Information Clearinghouse (NDIC)," n.d.).**
- **iTunes apps are available for keeping logs, self management, dose calculation with food, etc** ("Apple - iTunes - Everything you need to be entertained," n.d.).

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