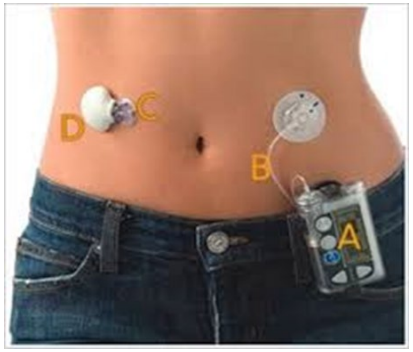
Management: Equipment and Guidelines

Insulin Delivery: Injections vs. Pumps



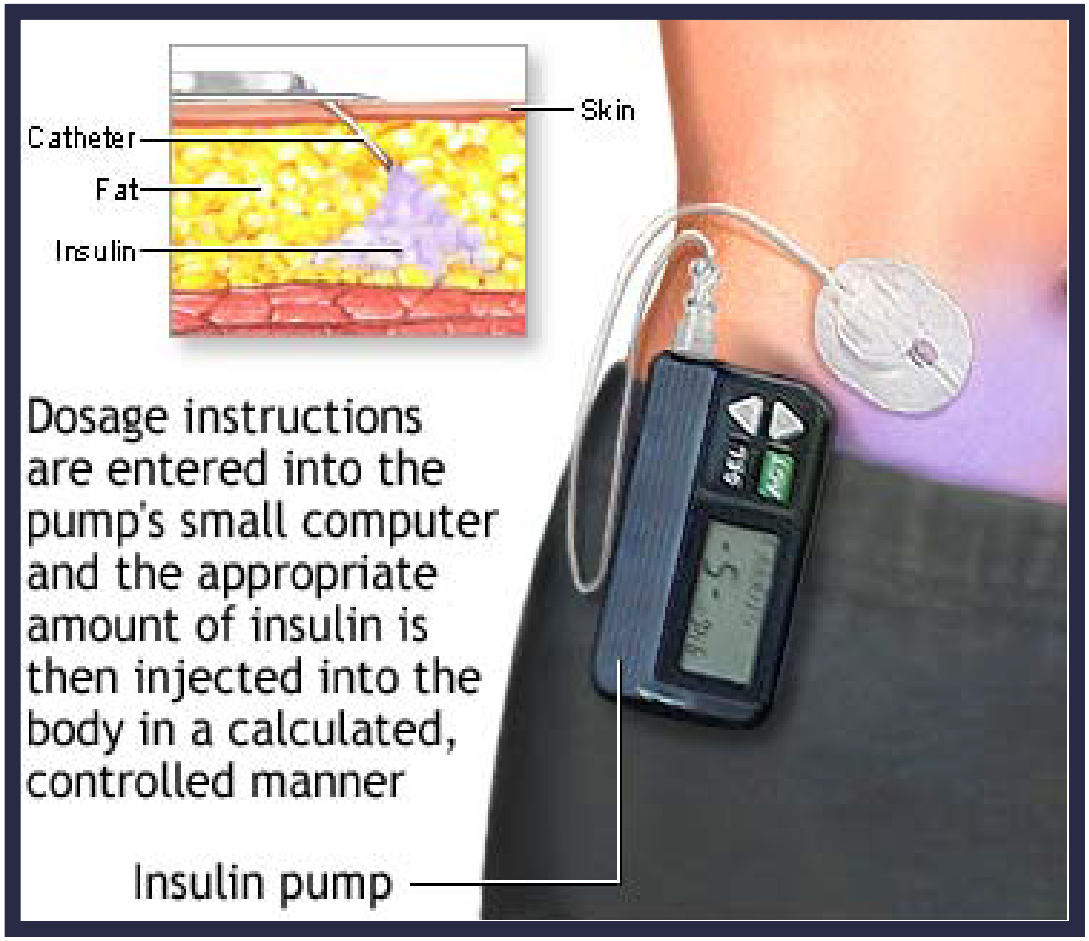
What is an Insulin Pump?

- Battery operated device
- Reservoir filled with insulin
- Computer chip with user control of insulin delivery
- Worn 24 hours per day
- Delivers only rapid-acting insulin

Insulin Pump Therapy

- Based on what body does naturally
  - *Small amounts of insulin all the time (basal insulin)*
  - *Extra doses to cover each meal or snack (bolus insulin)*
- Precision, micro-drop insulin delivery
- Flexibility
- Ease of correction for high blood glucose levels

Dosing with an Insulin Pump



What Nurses Should Know About an Insulin Pump

- How to deliver routine boluses for carbs and high blood glucose
- Signs/symptoms that pump site may need to be changed
- When an injection by pen or syringe is indicated
- How to disconnect or “suspend” the pump

Tandem t:simulator App

A demo as simple as our pump

The t:simulator™ app lets you experience the simple touchscreen interface of the t:slim X2™ insulin pump using your mobile device.

- No prescription
- No phone calls
- No paperwork
- No obligation

COMPATIBLE DEVICES

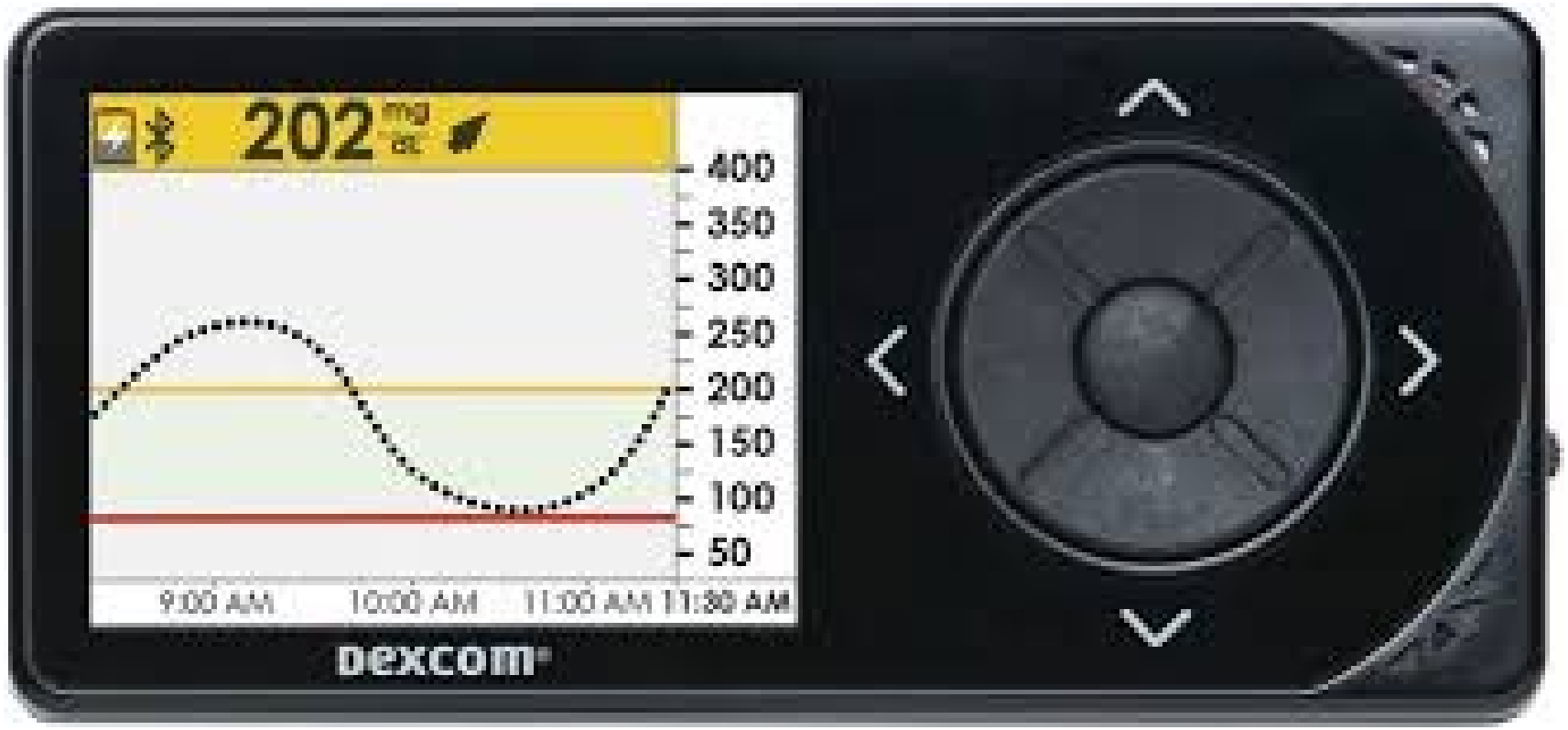
- iPhone 5 or later
- Android 5.0 Lollipop or later
- iPad 2 or later
- iPod touch 5G or later

Glucose Monitoring:
Blood vs. Continuous Sensors

Continuous Glucose Monitoring (CGM)

How it works:

- A tiny glucose-sensing device called a "sensor" is inserted just under the skin
- The sensor measures glucose in the tissue and sends the information to a small device or smart device
- Trend arrow at top of graph next to blood glucose number will show whether glucose is steady, dropping, or rising
- The system automatically records an average glucose value every few minutes for up to 3, 5, or 7 days
- Finger stick pokes and regular meter needed to calibrate some models
- Alarms signal when glucose is out of target range


202
mg
dL
400
350
300
250
200
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9:00 AM
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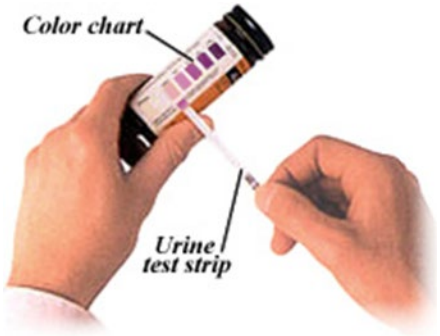
dexcom

What Are Ketones?

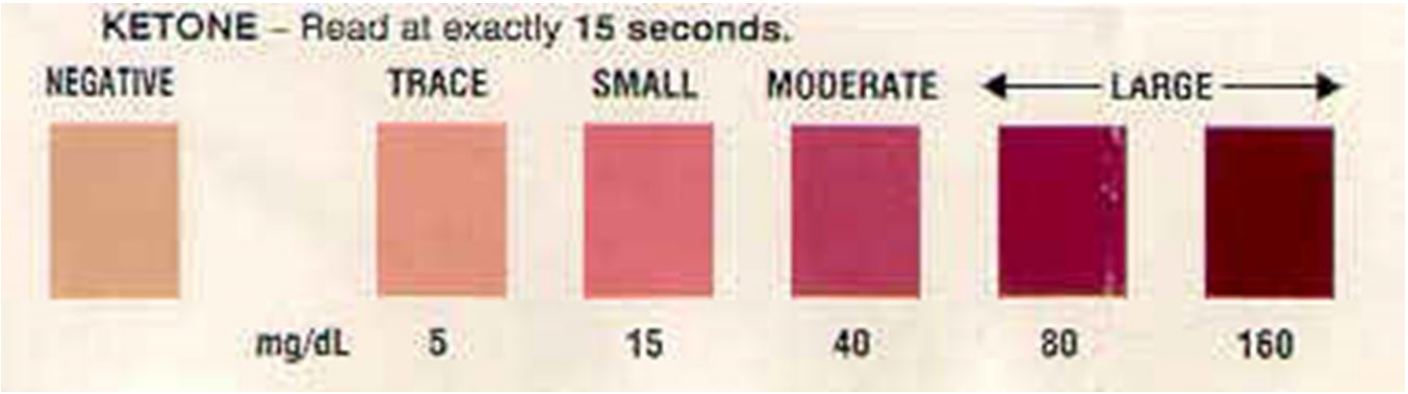
- Acids that result when the body does not have enough insulin and uses fats for energy
- May occur when insulin is not given, during illness or extreme bodily stress, or with dehydration
- Can cause abdominal pain, nausea, and vomiting
- Without sufficient insulin, ketones continue to build up in the blood and result in diabetic ketoacidosis (DKA)

Checking for Ketones

- Urine testing
  - *Most widely used method*



- Blood testing
  - *Requires a special meter and strip*
  - *Procedure similar to blood glucose checks*



Dosing with an Insulin Pen

Prime: Dial "2" units. *If the pen is being used for the first time, prime 4-6 units as per manufacturer's instruction.*

Hold upright. Remove air by pressing the plunger. *Repeat "Prime" if no insulin shows at end of needle.*

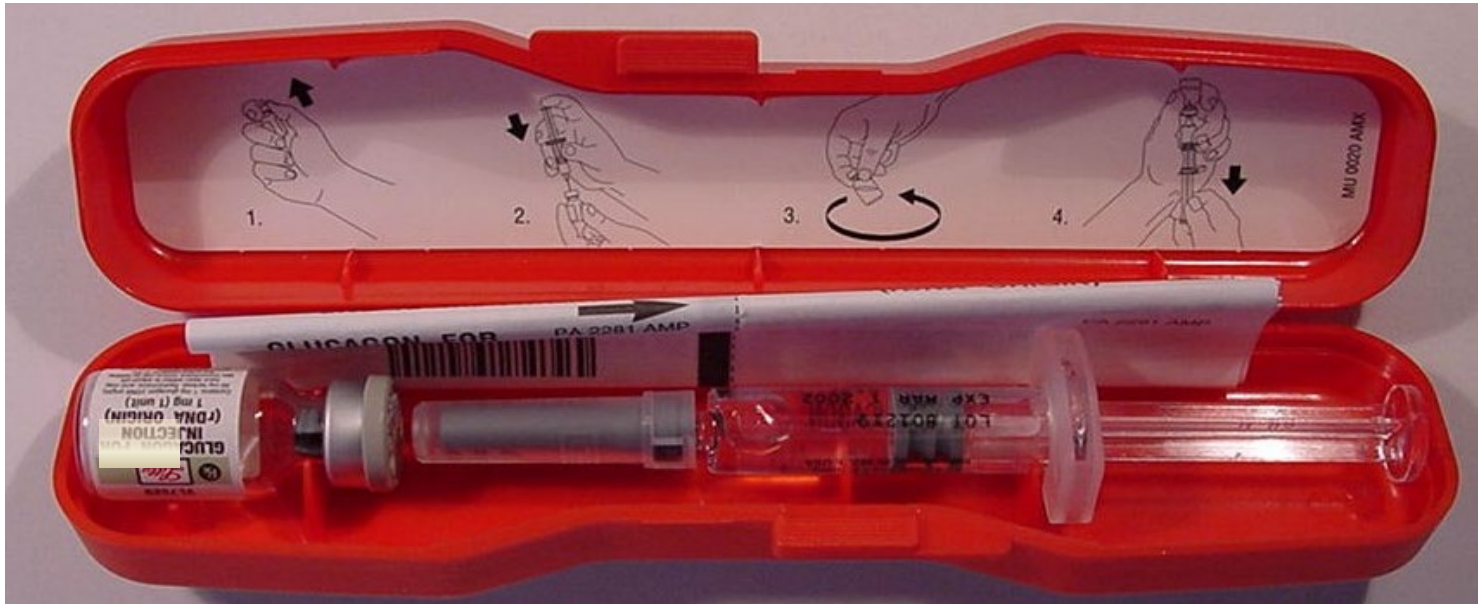
Dial number of units to be administered as per doctor orders.

Emergencies: What is Glucagon?

- Naturally occurring hormone made in the pancreas
- A life-saving, injectable hormone that raises blood glucose level by stimulating the liver to release stored glucose
- Treatment for severe hypoglycemia
- Life-saving, cannot harm a student/cannot overdose

Emergency Kit Contents:

1 mg of freeze-dried glucagon (vial)
1 ml of water for reconstitution (syringe)



Combine immediately before use

Procedure: Act Immediately

- If possible check blood glucose, don't delay
- If in doubt, always treat
- Position student safely on side for comfort and protection from injury
- School nurse or trained personnel notified to give glucagon in accordance with DMMP or emergency care plan
- Call 911, parent/guardian, school nurse as per DMMP or emergency care plan

NEW: Baqsimi Glucagon

- Dry nasal spray to be given for hypoglycemic emergencies
- Dispense once into one nostril
- Free trainers available from Lilly

What's New in Diabetes Technology?

- Less math, less pain, fewer fingersticks/injections
- Rates of CGM use in school age children have quadrupled in past decade
- New terminology: sensor glucose vs. blood glucose
- Most leading brands of CGM now within 10% accuracy of the serum glucose
- Low Glucose Suspend/ Predictive Low Glucose Suspend
- Automated insulin delivery systems still in development: Beta Bionics Bionic Pancreas System combines insulin and also has installed glucagon
- May see CGM trend arrows starting to be used in treatment
- New split catheters that allow insulin to flow out of two holes (less occlusions)
- Insulin pens with built-in Bluetooth, enabling dose data to be sent to a phone

CGM TREND ARROWS

123	**Steady:** Not increasing/ decreasing more than 1 mg/dL each minute.
123	**Slowly falling:** Glucose could decrease up to 30 mg/dL in 15 minutes.
123	**Falling:** Glucose could decrease up to 45 mg/dL in 15 minutes.
123	**Rapidly falling:** Glucose could decrease more than 45 mg/dL in 15 minutes.

123	**Slowly rising:** Glucose could increase up to 30 mg/dL in 15 minutes.
123	**Rising:** Glucose could increase up to 45 mg/dL in 15 minutes.
123	**Rapidly rising:** Your glucose could increase more than 45 mg/dL in 15 minutes.

Guidelines: Why are They Needed?

- Consistency in district
- Easier to defend process when everyone is on same page
- Developing/writing/having guidelines forces everyone to look at best practices
- All students receive care that is at the same level of standard, especially important for students who move/transfer to another school in the same district
- Panel reviewed by experts

Final thoughts…

Ultimately, the school nurse is the "Health Ambassador" of the school and should expect to provide info, education, and guidance to staff on an ongoing, continual basis