

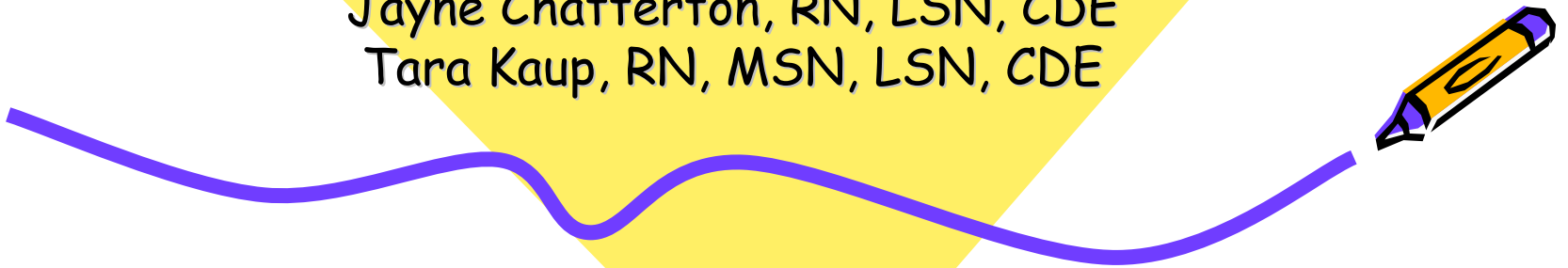


Diabetes in the School Setting

Management Strategies

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Types of Diabetes

- Type 1 Diabetes--Insulin Deficient
- Types 2 Diabetes--Insulin Resistant
- Gestational Diabetes
- Other



Type 1 Diabetes

- Autoimmune process resulting in absolute insulin deficiency.
- Requires insulin for survival.
- May have family member with Type 1 diabetes.
- Varied and individualized management strategies.
- Management strategies aimed at physiologic blood sugar patterns.



Type 2 Diabetes

- Typically develops around the time of puberty, but can occur earlier.
- Incidence has increased in youth by 30% over past 10 years.
- Insulin resistance is primary defect.
- Increased prevalence in African American, Hispanic, Asian and Native American populations.
- Family history and obesity, are contributing factors.



Type 1 and Type 2 Management Challenges

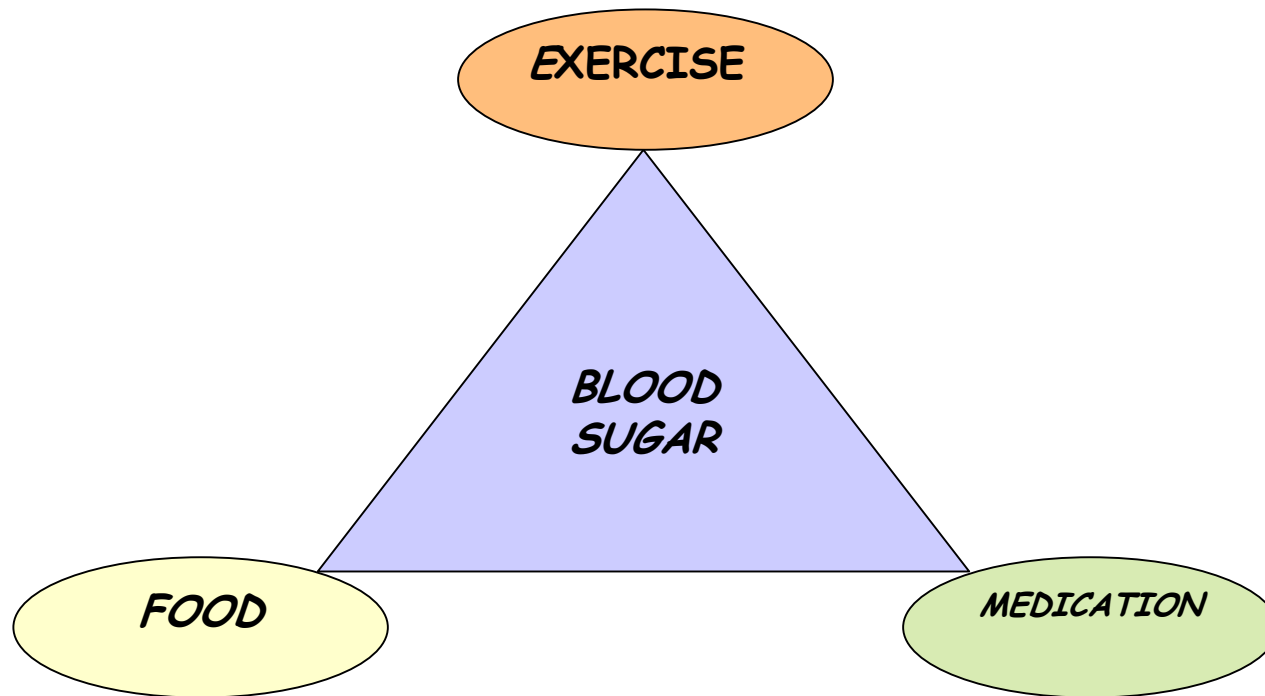


- Type 1 will require insulin injections; physiologic patterns require multiple injections
- Type 2 may be managed with oral medications and/or insulin injections
- Nutrition challenges presented for both types



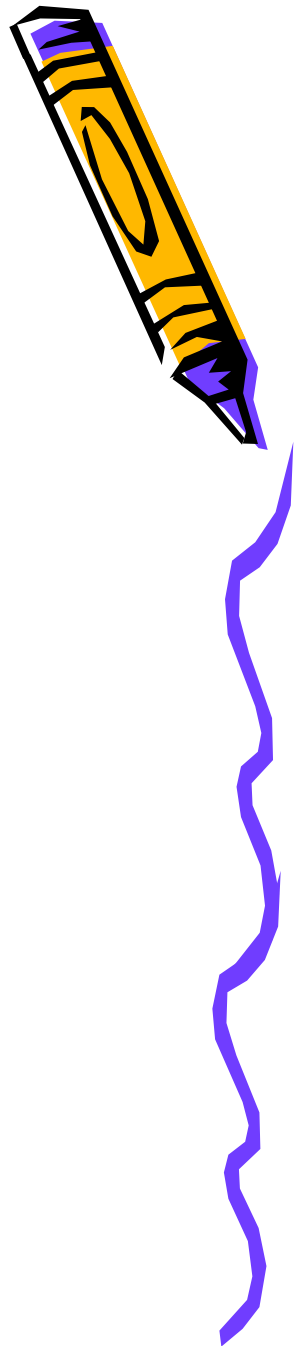
Diabetes Management Tool Kit

Diabetes Balance:



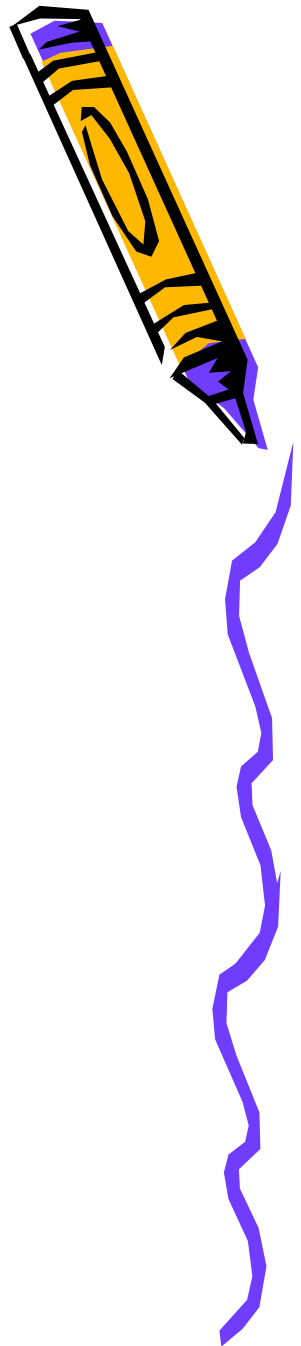
Meal Planning

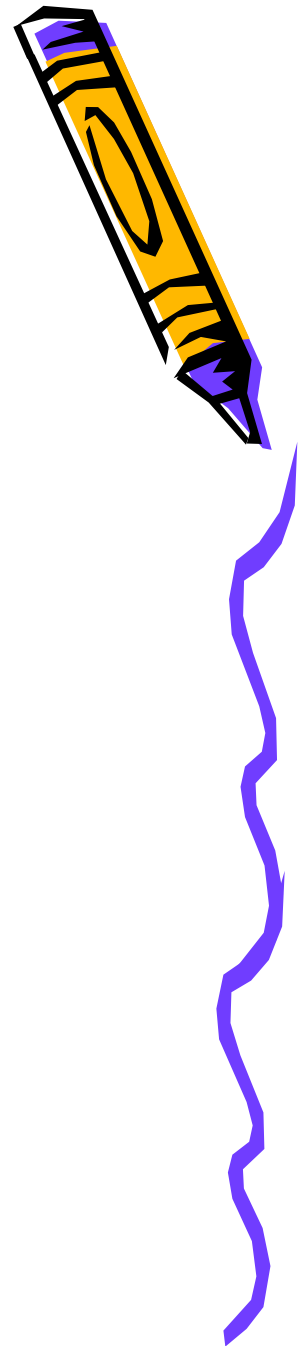
- Consistent amount of carbohydrates in each meal.
- Adequate nutritional intake to promote normal growth and development.
- Consistent timing of meals.
- Avoid “feeding the insulin” and focus on adjusting insulin to meet carbohydrate intake.



Wednesday 1 Lunch

- Hamburger or
Cheeseburger
Shredded Lettuce
Tater Tots
Tossed Salad
Banana
Breakfast
Sausage Biscuit or
Assorted Cereal



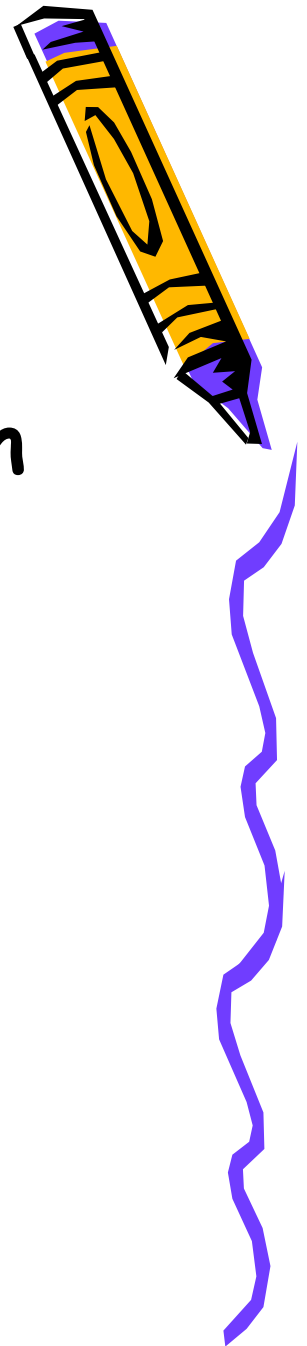


- Cheeseburger with Bun
Nutrition Facts
- Serving Size 1 Amount Per Serving
- Calories 280 Total Fat
11.84g Saturated
Fat 4.66g Sodium 492mg
- Total Carbohydrate 21.1g
Total Protein 16.11g
- Notes: Contains Soy Protein



District 833

Secondary Lunch Menu

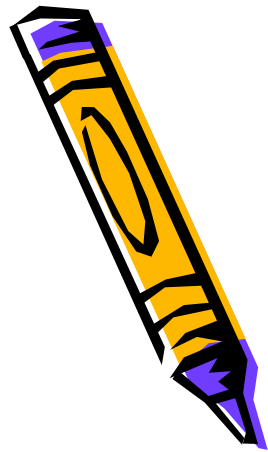


- Menu Item Chicken Patty on Bun
- Carbohydrate Content
- Chicken Patty = 11gm
- Bun = 24gm
- Condiments = 3gm
- Total CHO= 38gm or 2 $\frac{1}{2}$ choices



Carbohydrate Counting

- Focus on fine tuning each child's individual wants and needs.
- Carbohydrate to insulin ratio is very individual.
- Most children/adults should have a insulin to CHO ratio.



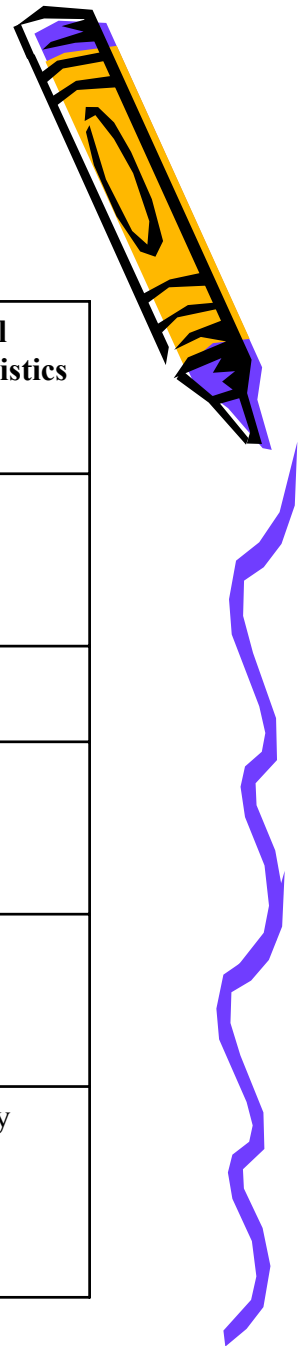
Insulin to Carbohydrate Ratio



- Very individual.
- Most children can start with 0.5 to 1.0 units of insulin to each 15 gms of carbohydrate.
- Insulin to CHO ratio may vary at different meals and with activity/exercise.
- During puberty, insulin to CHO ratio often increases.



Insulin Actions



- Average Times of Insulin Action

Type of Insulin	Onset of Action	Peak Action (hours)	Effective duration of action (hours)	Maximum duration of action (hours)	Visual Characteristics
<i>Rapid-acting</i> Lispro or Aspart (Humalog/Novolog)	10-15 minutes	30-90 minutes	3-4 hours	4-6 hours	Clear
<i>Fast-acting</i> Regular	30-60 minutes	2-3 hours	3-6 hours	6-9 hours	Clear
<i>Intermediate-acting</i> NPH Lente	2-4 hours 3-4 hours	6-10 hours 6-12 hours	10-16 hours 12-18 hours	14-18 hours 16-20 hours	Cloudy
<i>Long-acting</i> Ultralente Glargine (Lantus)	6-10 hours 1-2 hours	10-16 hours none	18-20 hours 24 hours	20-24 hours 24 + hours	Clear
<i>Combinations</i> 70/30 NPH/Regular 75/25 NPH/Humalog	30-60 minutes 10-15 minutes	Dual Dual	10-16 hours 10-16 hours	14-18 hours 14-18 hours	Cloudy

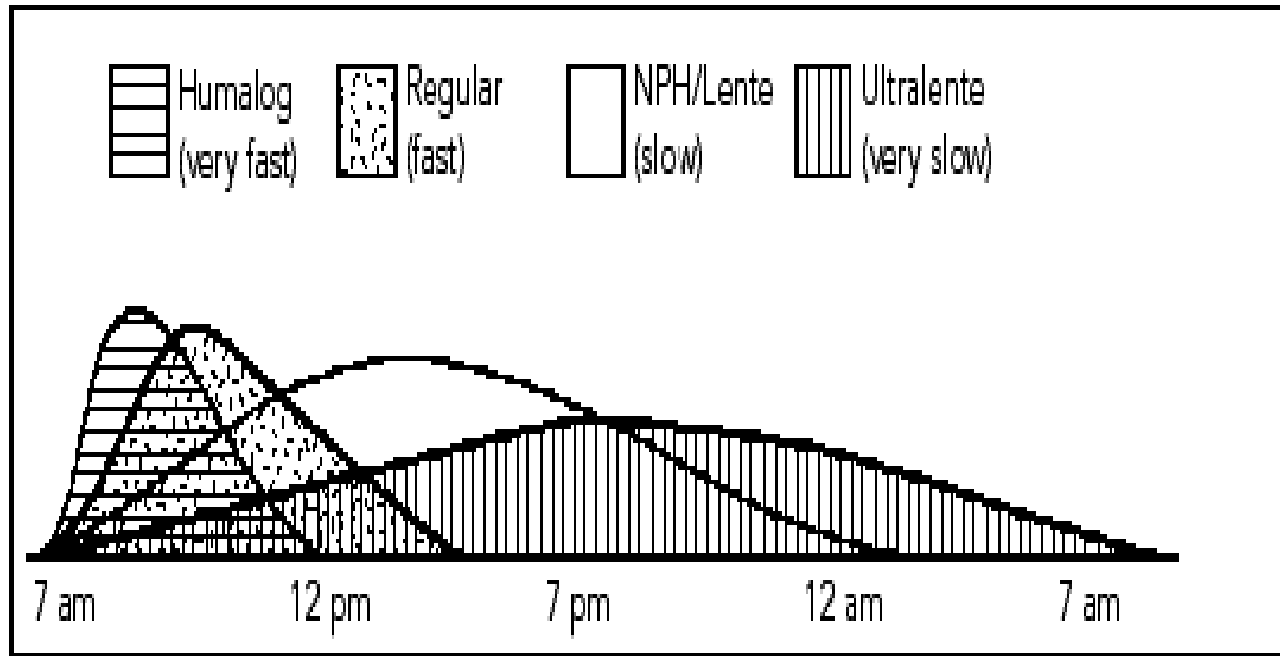


Source: Adapted from A Core Curriculum for Diabetes Education, 1998

Insulin Patterns



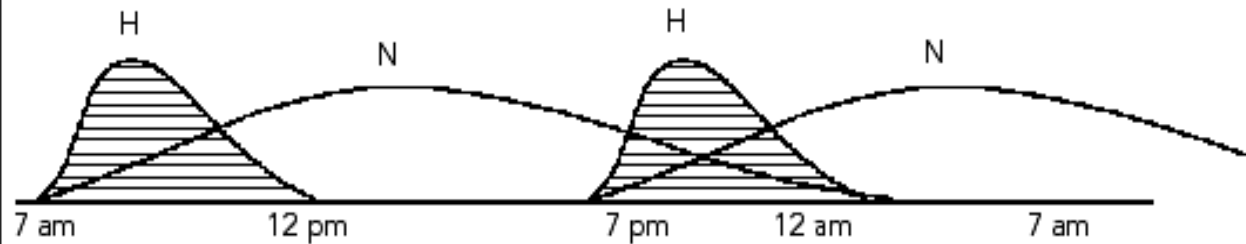
- Figure 1: *Onset, Peak and Duration of Types of Insulin*



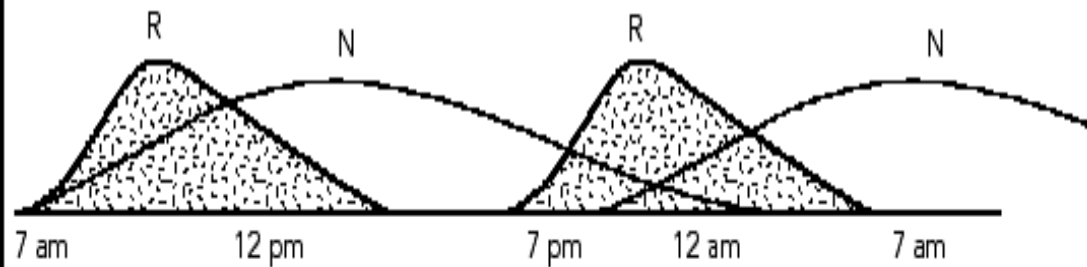
Insulin Patterns



Split Mix Dose: 2 injections of Humalog and NPH



Three injections: Regular and NPH before breakfast,
Regular before supper and NPH before bed.



Oral Medications

- Insulin Secretagogues: (Help pancreas secrete more insulin).
Sulfonylureas/Nonsulfonylureas
- Biguanides (Decrease glucose production by liver).
- Alpha Glucosidase Inhibitors (slow down absorption of glucose).
- Thiazolidinediones (Insulin sensitizing agents).



Exercise/Activity

- Important component of diabetes management.
- Generally exercise will lower blood sugar.
- Students may need changes in insulin or extra snacks to prevent low blood sugar reactions with increased activity.



Blood Glucose Monitoring

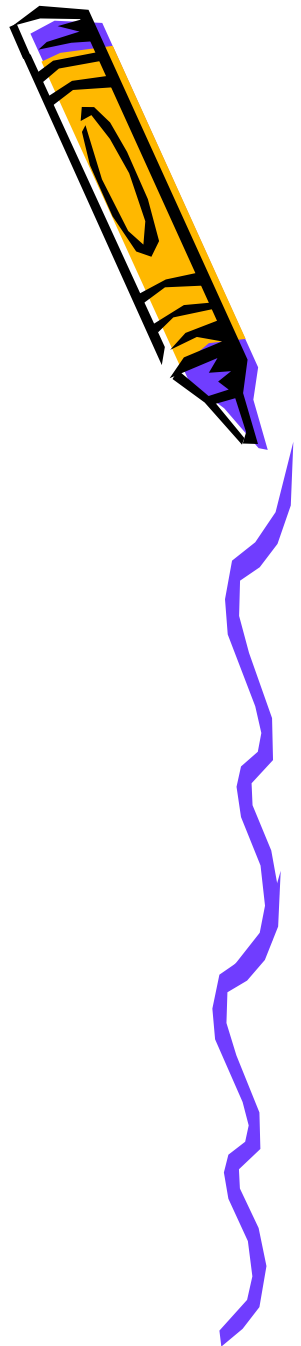


- Measure the effects of balancing food, exercise and medication.
- Type 1 diabetes generally 4-6 times per day.
- Type 2 diabetes may test less often.
- Benefits of pre and post-prandial testing.



Blood Glucose Testing

- Meter technology
- Classroom/independent testing
- Continuous Glucose Monitoring System
 - CGMS
 - 72 hour monitoring of blood glucose levels
 - Benefits of feedback



Insulin Delivery Options

Pens & Pumps



- Insulin pen options: recommend use of pen for school setting
- Easier dosing
- Careful to verify dose
- Insulin pump therapy
- Benefits of a more physiologic pattern
- Expense and technology may prohibit use for some students
- Pump and pen demonstration

