



### Diabetes Boot Camp – Class 4

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Special Insulin and Pattern Management  
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### Important Stuff

- ▶ Welcome to our 4<sup>th</sup> Boot Camp – This is the second half of Insulin and Pattern Management.
- ▶ The handout includes content for Boot Camp 4.
- ▶ I will stay after the program to answer questions
- ▶ The course will be recorded and available for viewing within 4 hours of completion of the session
- ▶ Login to the Online University to hear the recorded version, take the quiz and get your CE
- ▶ Please email us with any questions or concerns at [susan@diabetesed.net](mailto:susan@diabetesed.net)

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### Basal Bolus – What Adjustments? Pt weighs 80kg

	Break	Lunch	Dinner	HS
Day 1	69 7H	79 5H	245 8H	190 22u Det
Day 2	81 7H	87 5H	170 8H	133 22u Det
Day 3	73 7H	94 5H	194 8H	110 22u Det
Day 4	62 7H	83 5H	211 8H	127 22u Det

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## Intensive Diabetes Therapy Insulin Dosing Strategy

### 50/50 Rule

▶ 0.5-1.0 units/kg day  
(.5 units/kg most common)

- ▶ Basal = 50% of total
  - Glargine Q day
  - NPH or Detemir BID

- Bolus = 50% of total
  - usually divided into 3 meals

### Example

▶ Wt 50kg x 0.5 = 25 units of insulin/day

- ▶ Basal dose: 13 units
  - Glargine 13 units Q day
  - NPH/Detemir 6u BID

- ▶ Bolus dose: 12 units
  - ▶ 4 units NovoLog, Apidra, Reg, Humalog each meal



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## Intensive Diabetes Therapy Insulin Dosing Strategy

### 50/50 Rule

▶ 0.3-1.0 units/kg day  
(.5 units/kg most common)

- ▶ Basal = 50% of total
  - Glargine Q day
  - NPH or Detemir BID

- Bolus = 50% of total
  - usually divided into 3 meals

### Example – You Try

▶ Wt 80 kg x 0.5 = \_\_\_\_ units of insulin/day

- ▶ Basal dose: \_\_\_\_ units
  - Glargine \_\_\_\_ units QD
  - NPH/Detemir \_\_\_\_ BID

- ▶ Bolus dose: \_\_\_\_ units
  - \_\_\_\_ units NovoLog, Apidra Humalog each meal



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## Basal Bolus – Using 50/50 Rule – Pt weighs 80kg

	Break	Lunch	Dinner	HS
Day 1	84 6H	89 7H	145 7H	190 20 u Det
Day 2	81 6H	97 7H	107 7H	133 20u Det
Day 3	79 6H	104 7H	124 7H	110 20u Det
Day 4	69 6H	103 7H	208 7H	193 20u Det

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### Poll Question 9

- ▶ Calvin takes 5 units reg before breakfast and dinner and 18 units of Lantus at HS. His am BG ranges from 143 to 172. What is best action?
- a. Increase dinner regular insulin to 6 units
- b. Decrease Lantus at HS by 2 units
- c. Increase Lantus dose at HS
- d. Evaluate him for somogyi effect



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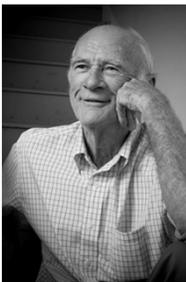
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### Based on Mr R's clinical picture – In hospital How Much Insulin Needed?



- ▶ Creatinine 1.6
- ▶ 76 years old
- ▶ Not very hungry
- ▶ BMI 21
- ▶ Weighs 80kg
- ▶ Glucotrol 5mg at home
- ▶ A1c 7.2%



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### Calculate Daily Insulin Needs

▶ Based on unique characteristics of pt, where would you start?

- ▶ Body wt in Kg x \_\_\_\_\_ = total daily dose
- ▶ May need more or less based on clinical presentation



←—————→  
Less 0.3 u/kg    0.5u/kg    More 1.0 u/kg

Thin, elderly, ↑ creat    Heavy, infection, steroids



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### Poll Question 10

- ▶ 76 year old patient who weighs 80kg. He needs 0.3 units/insulin per kg. Using the 50/50 formula, what would be his meal time bolus?
- a. 3 units
- b. 4 units
- c. 12 units
- d. Based on sliding scale.



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### Calculate Insulin Needs Basal/ insulin carb/ correct

- ▶ Body wt in Kg x 0.3
- ▶  $80\text{kg} \times 0.3 = 24$  units daily
  
- ▶ Basal = 12 units
- ▶ Bolus =  $12 \text{ units} / 3 \text{ meals} = 4$  units each meal
- ▶ What if he is nauseated?



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### 2<sup>nd</sup> Half – Special Basal Bolus Section

- ▶ Carb counting
- ▶ Prandial coverage
- ▶ Correcting for hyper and hypoglycemia



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## Bolus Basics



- ▶ Carbohydrate/ Prandial Coverage
  - ▶ Match the insulin to the carbohydrates
  - ▶ 1 unit for 15 gms - Common starting point
- ▶ Correction Bolus - targets hyperglycemia
  - ▶ 1 unit for every 30-50 points over target
- ▶ Adjust ratios depending on sensitivity and response




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## Carbohydrate Ratio How does that work?

Rapid/Fast Acting Insulin

### ▶ Dinner (60 gms cho)

- ▶ Lemon Chicken
- ▶ 1 cup rice pilaf  
(45 gms cho)
- ▶ Asparagus
- ▶ Dinner Roll  
(15 gms cho)

Blood Glucose 165mg/dl

Serving Size	Gms CHO	Insulin
1	15 gms cho	1 unit
2	30 gms cho	2 units
3	45 gms cho	3 units
4	60 gms cho	4 units

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## Poll Question 11

▶ Pt injects insulin and takes 1 unit novolog for 10 gms of carb. Meal 1 cup rice, bbq steak, sm banana, SF ice tea. BG 98.

- a. 8 units
- b. 7.2 units
- c. 6.0 units
- d. 5.0 units




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## Adjusting Bolus and Correction Doses Carbohydrate-to-Insulin Ratio

Based on three questions before meals:



1. How much carbohydrate am I going to eat?
2. What is my insulin dose for this amount of carbohydrate?
3. Should I lower the dose because I plan to be very active or have recently been active?



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## Correction Bolus

Rapid/Fast Acting Insulin (1 unit:50 mg/dl>150)

Less than 70	Subtract 1 unit
70-150 mg/dl	0 units
151-200 mg/dl	1 unit
201-250 mg/dl	2 units
251-300 mg/dl	3 units
301-350 mg/dl	4 units
351-400 mg/dl	5 units

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## Poll Question 12

Bob's correction scale is 1 unit for every 30 above his target of 120. His BG is 210. How much correction insulin?

1. 2.5 units
2. 3 units
3. Needs to count carbs first
4. Depends on his activity level



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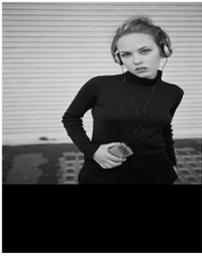
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## Type 1 and a Teen



- ▶ Cindy is trying to carb count and adjust her insulin, but is still having trouble. She weighs 60kg.
  - ▶ What is her daily dose of insulin?
  - ▶ What is her basal dose?
1. Pre meal target BG is 120
  2. Post meal goal < 180.
  3. Carb ratio: 1 unit for every 15 gms
  4. Hyperglycemic correction factor is one unit for every 55 above goal (she uses Humalog and 1700 rule)

**1700 Rule**  
 $1700 / TDD = \text{insulin sensitivity}$   
 $1700 / 30 = 56$   
 1 unit drops BG 56 points



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## Correction Bolus for Cindy

Analog Insulin (1 unit:55 mg/dl>120)

Less than 70 mg/dl	Subtract 1 unit
70-119 mg/dl	0 units
120-175 mg/dl	1 unit
176-230 mg/dl	2 units
231-285 mg/dl	3 units
286-340 mg/dl	4 units
341-395 mg/dl	5 units



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## Adjusting Cindy's Bolus Insulin With Ratios

BG before lunch 285, she plans to eat 45 gms of carbohydrate.

$$285 - 120 = 165 \text{ over target, } 165 / 55 = 3$$

$$45 \text{ gms} / 15 = 3$$

- 3 units bolus insulin to correct to target
- 3 units bolus insulin to cover carbs in meal

**Total adjusted dose: 6 units humalog insulin**



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**Poll Question 13 - Adjusting Cindy's Bolus Insulin With Ratios - You Try**

BG before lunch 230, plans to eat 60 gms of carbohydrate?

\_\_\_\_-120 = \_\_\_\_ over target, \_\_\_\_ / 55 = \_\_\_\_ units

\_\_\_\_ gms / \_\_\_\_ = \_\_\_\_ units ins for carbs

- \_\_\_\_ units insulin to correct for hyperglycemia
- \_\_\_\_ units insulin to cover carbs in meal

**What is her total adjusted insulin dose?**

- a. 4 units
- b. 5 units
- c. 6 units
- d. 3 units



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**How much Insulin Needed?**

- ▶ Morning - BG 173
  - ▶ Breakfast – slice cold pizza, ½ c. applesauce
- ▶ Lunch BG 69
  - ▶ Menu- ham sandwich, pear, diet 7-up, mini snickers bar.
- ▶ 2 hours after lunch, BG 148 - ran track
- ▶ Before dinner - BG 98
  - ▶ Cheeseburger, small fries, chocolate chip cookie
- ▶ At bedtime, BG 173



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**Cindy, 60kg, Carb (1u/15gms) Target 120 pre meal, Hyper 1 for 55**

	Break	Lunch	Dinner	HS
Day 1	99	154	128	69
Pre meal BG	2uH	6uH	5uH	15 GI
Carb	30gms	75gms	60gms	15gm
Day 2	143 / 184	122 / 156	220 / 89	228
Pre/ post meal BG	3uH	4uH	5uH	15 GI
Carb	45gms	60gms	45gms	0gm

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## Poll question 14

- ▶ Paul has had type 1 diabetes for 40 years and injects insulin 4 times a day. Which of the following is important to assess?
- a. Does he clean his needle before he reuses it?
  - b. Is he wiping his skin thoroughly with alcohol before injection?
  - c. Does he bend his needle before placing in trash?
  - d. Is he rotating sites?



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## Insulin Teaching Keys

- ▶ Bolus insulin with meals
- ▶ Basal 1-2xs daily
- ▶ Abdomen preferred injection site
- ▶ Stay 1" away from previous site
- ▶ Don't re-use ultra fine syringes
- ▶ Keep unopened insulin in refrigerator
- ▶ Look for hyper
- ▶ Toss opened insulin vial after 28 days
- ▶ Proper disposal
- ▶ Review patients ability to withdraw and inject.
- ▶ Side effects include hypoglycemia/wt gain
- ▶ Insulin pens –
  - ▶ Prime needle to assure accurate insulin dose given
  - ▶ Hold needle in for 5 seconds after injection
  - ▶ Roll 70/30 pens



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## Sharps Disposal: Product and Info



- ▶ Look in the Government section white pages for a household hazardous waste listing for your city or county.
- ▶ Call 1-800-CLEANUP (1-800-253-2687)
- ▶ Search for collection centers on the California Integrated Waste Management Board (CIWMB) Web site: <http://www.ciwmb.ca.gov/HW/HealthCare/Collection/>



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### Poll Question 15

Which of the following is a lifestyle indications for insulin pump use?

- a. stable schedule
- b. limited travel
- c. need for structure
- d. varied work shifts



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### Poll Question 16

▶ Joan is on an insulin pump. She takes 1 unit Humalog for 10 gms carb. Meal 1 small potato, bbq chicken, 1 c. regular milk, 1 c. of jello, 1/3 cup of beans. BG 118. How much insulin?

- a. 4.7 units
- b. 6.0 units
- c. 7 units
- d. 5.7 units



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### Poll Question 17

▶ Mary takes 6 units lispro (Humalog) before dinner. Which BG result reflects that it was the right dose?

- a. Before breakfast BG of 97
- b. 1 hr post dinner BG of 189
- c. Before dinner blood glucose of 102
- d. 2 hour post dinner BG of 178



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# Thank You



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