

Bailey Peterson

Cxxxxxx, Oxxxx

Male

33 yo

Allergies: NKA

Code: FULL

Isolation: NONE

Pt. Location: RM 1307

Physician: J. Robinson

Admit Date: 12/02/16

Pt Summary: O.C. is a 33 yo male admitted through the ED with c/o excessive thirst and frequent urination of 2 wk duration, in addition to increased appetite and weight loss of 12 pounds in 3 weeks.

PMH: pt was product of normal pregnancy and delivery; had varicella at age 6, and an appendectomy at age 15. No Medications. NKA.

FH: Parents L&W(living and well). Paternal uncle has Type 1 DM; Maternal grandfather died of CVD 2° to Type 2 DM. Other grandparents L&W. Has 1 sibling, a younger brother, L&W.

Social Hx: 33 yo male, post-doc at UC Davis. Pt used to play soccer three times a week, but says he now tires easily so he has not played in 3 weeks.

ROS:

GI:	No hx of N/V, or diarrhea
GU:	No hx of urgency, frequency, or burning urination except for present complaint of polyuria
CNS:	Alert and oriented, no hx of impaired LOC (loss of consciousness), convulsions, or difficulty walking

PE:

General:	Slightly underweight, tired appearing male; wt: 170# ht: 73"
Vitals:	T 98.2°F; P 120; R 27 with fruity odor; BP 110/70 mm Hg
Lungs:	Clear to percussion and auscultation
Heart:	Normal sinus rhythm, no murmurs
HEENT:	Non-contributory
Abdomen:	Flat, non-tender, no liver enlargement
Genitalia:	nl
Extremities:	Non-contributory
CNS:	Normal gait and deep tendon reflexes
Skin:	Smooth, warm, dry, no edema
Peripheral Vascular:	Pulse +4 bilaterally

Laboratory Results

	Ref. Range	12/02/16 1210 (non-fasting)
Chemistry		
Sodium (mEq/L)	136-145	129 ! ↓
Potassium (mEq/L)	3.5-5.5	3.6

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Chloride (mEq/L)	95-105	101
Carbon dioxide (CO ₂ , mEq/L)	23-30	32 ! ↑
BUN (mg/dL)	8-18	17
Creatinine serum (mg/dL)	0.6-1.2	1.1
Glucose (mg/dL)	70-110	372 ! ↑
Phosphate, inorganic (mg/dL)	2.3-4.7	2.0 ! ↓
Magnesium (mg/dL)	1.8-3	1.9
Calcium (mg/dL)	9-11	10
Osmolality (mmol/kg/H ₂ O)	285-295	303 ! ↑
Bilirubin total (mg/dL)	≤1.5	0.2
Bilirubin, direct (mg/dL)	<0.3	0.01
Protein, total (g/dL)	6-8	6.9
Albumin (g/dL)	3.5-5	3.2 ! ↓
Prealbumin (mg/dL)	16-35	14 ! ↓
Ammonia (NH ₃ , umol/L)	9-33	9
Alkaline phosphatae (U/L)	30-120	110
ALT (U/L)	4-36	6.2
AST (U/L)	0-35	21
CPK (U/L)	30-135 F; 55-170 M	61
Lactate dehydrogenase (U/L)	208-378	229
Cholesterol (mg/dL)	120-199	180
Triglycerides (mg/dL)	35-135 F; 40-160 M	150
T ₄ (ug/dL)	4-12	8
T ₃ (ug/dL)	75-98	81
HbA _{1c} (%)	3.9-5.2	8.55 ! ↑
C-peptide (ng/mL)	0.51-2.72	0.52
ICA	-	+ ! ↑
GADA	-	+ ! ↑
IA-2A	-	-
IAA	-	+ ! ↑
tTG	-	-
Hematology		
WBC (x 10 ³ /mm ³)	4.8-11.8	10.6
RBC (x 10 ⁶ /mm ³)	4.2-5.4 F; 4.5-6.2 M	5.8
Urinalysis		
Collection method	-	Clean catch
Color	-	Yellow
Appearance	-	clear
Specific Gravity	1.003-1.030	1.008
pH	5-7	4.8 ! ↓

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Protein (mg/dL)	Neg	+1 ! ↑
Glucose (mg/dL)	Neg	+4 ! ↑
Ketones	Neg	+ 4 ! ↑
Blood	Neg	Neg
Bilirubin	Neg	Neg
Nitrites	Neg	Neg
Urobilinogen (EU/dL)	<1.1	Neg
Leukocyte esterase	Neg	Neg
Protein check	Neg	tr ! ↑
WBCs (/HPF)	0-5	0
RBCs (/HPF)	0-5	0
Bacteria	0	0
Mucus	0	0
Crys	0	0
Casts (/LPF)	0	0
Yeast	0	0

Dx: New Onset Type 1 Diabetes Mellitus

MD's Plan: Admit, achieve glycemic control with Regular Insulin then adjust to daily therapy with mixed insulin therapy; initiate DSM training; nutrition consult for hospital and home diet planning and pt. education.

You are the in-patient RD.

You meet with O.C. to do a nutrition assessment and begin a general introduction to dietary management of diabetes. You take a diet history (listed below) as part of your assessment. O.C. states that these are the types of foods that he usually eats, but the quantity is much greater than usual because he has felt so hungry lately. O.C. is Muslim and follows Islamic dietary laws.

Breakfast (eaten at home):

- 1 c. oatmeal with brown sugar and ½ cup of 2% milk
- 1 c. juice (orange, apple, or cranberry)
- Toast (2 slices or English muffin) w/ butter & jelly
- Coffee with sugar and 2% milk
- (occasionally 2 scrambled eggs instead of the cereal)

Lunch (eaten at the CoHo/Silo on weekdays):

- 2 slices of cheese pizza with a small salad *or*
- Grilled cheese and French fries *or*
- Meal from Shah's Halal Food cart – Gyro or Rice Plate (lamb/chicken)
- 16 oz of sweetened iced tea

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dessert such as cookies or a brownie
(sometimes 8 oz of 2% milk instead of the iced tea)

Mid afternoon:

medium mocha or latte,
A cookie or a piece of fruit

Dinner:

~6 oz. meat (chicken/lamb/beef, occasionally fish)
1 cup of rice
Vegetables in season (will eat w/ salt & butter)
12 ounces of 2% milk

or

A vegetarian sandwich and chips and soda if he does not have time to cook

HS:

O.C. eats one of the following:
Bag of microwave popcorn w/ 1-12 oz can of regular soda
2 scoops of ice cream
1 c 2% milk and 4-5 cookies
2 oz. cheese and 12 “Wheat Thin” crackers

1. Compare O.C.’s admission laboratory values with normal values. What does each value indicate, based on the hospital’s lab value reference ranges above? Use your texts for non-fasting BG values. (5 pts)

Test	nl Values	O.C.’s Values	Comparison: </=> nl values	What do O.C.’s lab values suggest about his metabolic state?
BG	70-110 mg/dL	372 mg/dL	>nl	DM, HTN, malnutrition, obesity (MNT Pocket Guide p 8)
Urinary glucose	Negative	+4	>nl	Renal glycosuria; indication of diabetes
Urinary ketones	Negative	+4	>nl	Risk of DKA (MNT Pocket Guide p 19)
PreAlb	16-35	14	<nl	DM, protein-wasting disease (MNT Pocket Guide p 17)
HbA _{1c}	3.9-5.2%	8.55%	>nl	DM and hyperglycemia (MNT Pocket Guide

				p 8)
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2. What is HbA_{1c} and what does HbA_{1c} measure? (1 pt)

HbA_{1c} stands for hemoglobin A_{1c}, a glycosylated hemoglobin assay. It measures the amount of glucose bound to hemoglobin protein and is a valid test to measure the degree of hyperglycemia. HbA_{1c} can measure the average amount of glucose concentration for the in the blood for the previous 2-3 months.

(NTP page 487)

3. List the following HbA_{1c} ranges. (2 pts)

Normal non-diabetic:	4-6% (Nut 116AL Diabetes, Slide 26)
Pt w/ controlled diabetes:	<7% (Nut 116AL Diabetes, Slide 26)
Pt w/ fair to poorly controlled diabetes:	>7% (Nut 116AL Diabetes, Slide 26)

4. Explain the role/relationship of HbA_{1c} in the development of micro- and macro-vascular complications of diabetes. (2 pts)

When someone has elevated HbA_{1c} levels, meaning they have diabetes, they are more likely to have long term micro-vascular and macro-vascular complications:

Macro-vascular: CVD. Risk factors include T2DM, HTN an dyslipidemia

Micro-vascular: Nephropathy; risk factors include HTN, hyperglycemia, Native American, Hispanic or African American decent. Retinopathy; risk factors include HTN, hyperglycemia and duration of DM.

Peripheral neuropathy with risk factors of DM >10 yr, poor glucose control, and other DM-related complications.

(NTP p 489)

5. What are three metabolic reasons for O.C.'s weight loss (number each for full credit). (2 pts)

1. Ketogenesis- as insulin deficiency persists, more hormones are produced leading to lipolysis. As the body breaks down more fats that are stored in the adipose tissues the fatty acids are transformed into ketones. When one is in ketosis, the body uses fat storage for energy, which typically is where most of our weight is at, which will lead to weight loss.

2. Proteolysis: Increase in protein degradation, which leads to muscle wasting and eventually weight loss.

3. Hypovolemia, decrease in blood volume, leads to imminent weight loss with people with T1DM.

(NTP p 481-482)

6. Describe and explain Islamic dietary laws and any dietary restrictions you would need to consider when counseling O.C. (2 pts)

Halal is an Arabic term meaning lawful. All foods are considered lawful, except for pork and all of its byproducts. As well as animals that have been improperly slaughtered or dead before slaughtered, animals slaughtered in the name of anyone other than Allah (God). Alcoholic drinks and intoxicants are also considered to be unlawful. Muslims are more aware of what is in their food and therefore usually know how to read food ingredient labels fairly well. Muslims must follow proper protocol when processing and preparing their food in order to make sure it follows the dietary guidelines and can be considered Halal.

(Islamic Food and Nutrition Council of America: *What is Halal*
<http://ifanca.org/Pages/staticwebpages.aspx?page=whatisHalal>)

7. Based on O.C.'s diet history information and what you know about MNT management of Type 1 DM, name 3 nutrition-related topics that are important to discuss in educating O.C. as he prepares to head home from the hospital. (3 pts)

1. Implementation of CHO counting and insulin-to-carbohydrate ratios/explain rationale for CHO counting
2. Provide practical tools for day-to-day meal
3. Talk about the importance of the pt's personal preferences, metabolic goals and ability and willingness to make changes

(Nut 116AL Diabetes Slide #29, 30, 33, 66)

8. You determine that O.C. needs **3000-3300** kcals/day based on EER calculations and the fact that O.C. needs to gain weight to achieve his normal weight. You want to follow his normal eating pattern as much as possible while still meeting his protein requirements and keeping the kcal from fat at 30-40% of total kcals. Using the Exchange Lists, develop a "pattern" for O.C.'s diet. (15 pts)

Food group	Number of Exchanges	CHO grams	Protein grams	Fat grams
Breakfast				
Starch/CHO	2	30	0	4
Fruit	1	15	0	0
Milk & Subs.(skim, 1%, 2% , or whole)	1	12	8	5
Protein (lean , med- or high-fat)	2	0	14	4
Fats	3	0	0	15

Morning Snack				
None				
Lunch				
Starch/CHO	3	45	0	6
Fruit	3	45	0	0
Milk & Subs.(skim, 1%, 2% , or whole)	1	12	8	5
Non-starchy vegetables	2	10	4	0
Protein (lean , med- or high-fat)	2	0	14	4
Fats	2	0	0	10
Afternoon Snack				
Starch/CHO	3	45	0	6
Milk (2%)	1	12	8	5
Fat	2	0	0	10
Dinner				
Starch/CHO	3	45	0	6
Fruit	3	45	0	0
Milk & Subs.(skim, 1%, 2% , or whole)	1	12	8	5
Non-starchy vegetables	2	10	4	0
Protein (lean, med- or high-fat)	2	0	14	10
Fats	3	0	0	15
HS Snack				
Milk (2%)	1	12	8	5
Starch/CHO	2	30	0	4
Fats	2	0	0	10
Total grams		380	90	129
		X4	X4	X9
kcal from each macronutrient		1520	360	1161
TOTAL KCAL:	3041	50%	12%	38%

9. O.C. is taught about his diet, insulin injections, SMBG, and other self-care issues prior to discharge. He is discharged on a basal injection of Levemir, with bolus injections of Novolog regular insulin at mealtimes. Provide the generic name and indication of each medication and its effects. Also note any dietary recommendations, contraindications/precautions, and interactions. What effect will these medications have on his nutritional care? Refer to the medication information in the FMI text. (3 pts)

Levemir®

Generic name:	Insulin detemir (FMI p 180 and 196)
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Classification:	Antidiabetic, hypoglycemic
Onset of Action:	0.8-2 hr
Peak:	No peak
Duration:	12-24 hr

Novolog[®]

Generic name:	Insulin (FMI p 180)
Classification:	Antidiabetic, hypoglycemic
Onset of Action:	10-20 min
Peak:	40-50 min
Duration:	3-5 hr

Levemir[®] & Novolog[®]

Indication:	Antidiabetic, hypoglycemic (FMI p 179-180)
Diet:	Diabetic meal plan to balance carbohydrate with insulin
Possible FMI:	Use alcohol with caution; alcohol increases hypoglycemic effect of insulin
Potential Nut/Oral/GI Side Effects:	Caution with lactation, hypoglycemia, transient edema, vision changes and rare-allergic reaction.

10. Write an ADIME note for O.C., using the information that you have obtained up until this point. Base your note on the pertinent information given in the presentation data, diet history, and questions above. Write the ADIME note below and attach a separate sheet with all calculations. Include two PES statements. (8 pts)

A:

Patient Hx: 33 yo male admitted through the ED with c/o excessive thirst and frequent urination of 2 wk duration, in addition to increased appetite and weight loss of 12 pounds in 3 weeks. Family hx of Type 1 and Type 2 Diabetes. Pt used to play soccer three times a week, but says he now tires easily so he has not played in 3 weeks.

Dx: New Onset Type 1 Diabetes Mellitus

Diet/Medication Order: Achieve glycemic control with Regular Insulin then adjust to daily therapy with mixed insulin therapy; home meal planning with help of RD. Currently on Levemir[®] & Novolog[®]

Anthropometrics:

Ht: 73"

CBW: 170 # (77.2 kg)

UBW: 182#

BMI: 22.1 (normal BMI)

Biochemical data:

Blood Glucose: 372 mg/dL; Urinary Glucose: +4; Urinary Ketones: +4; PreAlb: 14 mg/dL; HbA1c: 8.55%

Estimated Needs (based on 77.2 kg (CBW)):

3000-3300 kcal/day

Protein: $77.2 \text{ kg} \times (0.8-1.0 \text{ g/kg}) = 62 \text{ g}-77 \text{ g}$

Fluid: Same as EER; 3000-3300 ml/d

Food and Nutrition Hx:

O.C is currently eating more due to polyphagia; quantity is much greater than usual because he has felt so hungry lately. O.C. is Muslim and follows Islamic dietary laws. Currently consumes a lot of carbohydrates and sugars AEB 24 hr food record.

D:

(NC- 3.2) Unintended weight loss r/t newly diagnosis of T1DM AEB 12 # decrease in last 3 wk.

(NI-5.8.2) Excessive carbohydrate intake r/t polyphagia and high CHO foods AEB high CHO and sugar intake in dietary food record and BG level of 372 mg/dL.

I:

MNT goal: provide nutrition education for newly dx T1DM and optimize pt understanding of how to properly follow dietary guidelines. Educate on how to count carbohydrates and be able to use the carbohydrate exchange list properly.

Recommendations:

-Agree with MD, continue with Levemir® & Novolog® to control blood glucose.

-Educate pt on glycemic index for meal planning

-Encourage physical activity (accumulating >150 min/wk)

-Diet Rx: consume 3000-3300 kcal/d to reach IBW with ~40-50% CHO, 30-40% fat, 20% pro with CHO at breakfast being 30-45 g

-Limit simple sugars

-Emphasize complex CHO & fiber

M/E

Have pt bring in records of SMBG and carb exchange list for next apt.
F/u in 2 wk with blood glucose panel and urinary labs; checking for glucose and ketones

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11. O.C. does well over the next few months in learning to manage his diabetes. However, he is finding it difficult to keep his activity and intake constant due to the fact that his schedule is variable, and he wants to resume playing soccer. He and the health care team agree to use an insulin pump with intensive therapy in order to make his self-care more flexible and achieve tighter glucose control. You begin teaching O.C. about carbohydrate counting. Describe briefly how this will differ from the exchange-based diet plan that he was using. (1 pt)

Exchange-based diet plans are designed so that foods can be traded or “exchanged” for one another, where each food on a particular list can be substituted for a different food on that same list. Carbohydrate counting gives the pt a certain number of CHO they are “allowed” to consume per day and the pt is responsible for recording the number for themselves. It is a consistent amount of CHO at meals/snacks and it accounts for starches, fruit, milk/yogurt and sweets. Typically 1 serving=1 carb=15 g CHO. Carb counting essentially helps to maintain a controlled intake of CHO throughout the day.

(Nut 116AL Diabetes Slide 56,57, 66)

12. O.C. brings his SMBG record in for review when he comes for nutrition counseling. The pre-prandial BG goal is 70-130 mg/dl. Several pre-meal entries are listed below.

Day	Breakfast	Lunch	Dinner	HS Snack
1	94	152	110	100
2	90	106	97	69
3	142	108	95	102

- a. Circle/highlight the values that are outside the desirable range. (1 pt)
- b. What adjustment(s) should O.C. make if the values are above the desirable range? (1 pt)

O.C. should opt out of a carb choice and choose something that is higher in protein and fat while decreasing his serving size of carbohydrates and sugars in order to make his BG level in the appropriate range.

- c. What adjustment(s) should O.C. make if the values are below the desirable range? (1 pt)

O.C. should increase his serving size of CHO (add another carb choice) in order to make his BG goal in the desirable range.

13. What adjustments should O.C. make on the days when he plays soccer? (1 pt)

On days O.C plays soccer and his BG is below pre-prandial levels, he should increase his carbohydrate intake as well as adjusting his insulin. O.C should increase his carbohydrates by 15-30 grams for every 1 hour of exercise he does, depending on how strenuous he plays.

(NTP p 504-505)

14. O.C. has caught a cold and has a fever of 102° F. He feels miserable and is not eating much. He calls you to ask if he should reduce his insulin dose since his diet is just a few foods (chicken noodle soup and diet 7-up). What advice would you give him and why? (2 pts)

O.C. should take his usual dosage of insulin during his acute illness. Insulin is still necessary and may even increase during the time of a fever. Since O.C is not eating much, I would advise him to replace meals with small amounts of liquid or soft carbohydrate-containing foods every 3-4 hours, making sure he eats about 45-60 grams of carbohydrates.

(NTP p 507)