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NUTR 7250 - Renal Diet Assignment  
50 points

48

1. Calculate a renal diet plan for the following patients: (10 points each)
- a. 45 year old female Ht: 5'8" (173cm) Weight: 170 pounds (77kg)  
BUN: 48 mg/dL (high) Creatinine: 2.2 mg/dL (high) K: 3.7 mEq/L (normal)  
P: 3.0 mg/dL (normal) - HTN, CAD

CAD – give less than 10% saturated fat and limit cholesterol to 250 – 300 mg  
Sodium – 1,500 - 2,000 mg, Potassium - AI = 4,700 mg (do not need to restrict),  
Phosphorus – RDA = 700mg (do not need to restrict)

**Calorie Range: 1,758 kcal – 2,695 kcal**  
35kcal x 77kg = 2,695 kcal

Mifflin:  $(10 \times 77) + (6.25 \times 173) - (5 \times 45) - 161 = 1,465 \times 1.2 = 1,758 \text{ kcal}$   
to  $1,465 \times 1.375 = 2,014 \text{ kcal}$

BMI = 25.6 (overweight) – Energy intake selected is between Mifflin equation and  
KDOQI recommendations

**Protein Range: 46g – 58g (at least 50% HBV)** ✓  
.6g x 77kg = 46g to .75g x 77kg = 58g

GFR MDRD Calculator = 24 (Stage 4)

Plan follows on next page. Note, due to her normal lab values, phosphorus does not need to be limited. However, the plan indicates phosphorous intake is 1,064mg, which is higher than the RDA of 700mg. Client should select lower phosphorous high protein foods. Lab phosphorous value should be monitored. If it becomes a problem, a phosphorus binder may need to be prescribed. Additionally, some of the phosphorus absorption may be blocked by the phytates in the other foods she is consuming (beans, legumes, whole wheat).

## Food Choices for CKD (National Renal Diet)

Food Choices	No. Choices	Avg Pro	Pro (g)	Avg Na	Na (mg)	Avg K	K (mg)	Avg P	P (mg)	Avg Cals	Calories (kcal)
<b>Protein Choices</b>											
<b>High protein</b>	4	7	28	85	340	100	400	75	300	75	300
<b>Higher phosphorus proteins</b>		7	0	85	0	200	0	200	0	75	0
<b>Higher sodium proteins</b>		7	0	325	0	100	0	75	0	75	0
<b>Lower Protein Foods</b>											
<b>Vegetable Group 1</b>	0	2.5	0	15	0	85	0	40	0	25	0
<b>Group 2</b>	0	2.5	0	15	0	200	0	40	0	25	0
<b>Group 3</b>	4	2.5	10	15	60	400	1600	40	160	25	100
<b>Breads, cereals, grains</b>	6	2	12	75	450	40	240	40	240	125	750
<b>Unit Choices :may be free</b>											
<b>Group 1</b>	0	0.5	0	5	0	85	0	11	0	60	0
<b>Group 2</b>	0	0.5	0	5	0	200	0	11	0	60	0
<b>Group 3</b>	4	0.5	2	5	20	400	1600	11	44	60	240
<b>Calorie Choices</b>	6	0.5	3	50	300	50	300	50	300	125	750
<b>Flavor Choices</b>	2	0	0	275	550	50	100	10	20	10	20
<b>Total</b>			<b>55</b>		<b>1720</b>		<b>4240</b>		<b>1064</b>		<b>2160</b>

b. 55 year old male Ht: 6'2 (188 cm) Weight: 195 pounds (89kg) Stage V CKD on Hemodialysis BUN: 65mg/dL (high) Creatinine: 6.7g/dL (high) K: 4.0 mEq/L (normal) P: 5.2 mg/dL (high – limit dairy and high phosphorous animal products)

**Calorie Range: 2,147 kcal – 3,115 kcal**

35kcal x 89kg = 3,115 kcal

Mifflin = (10 x 89) + (6.25 x 188) - (5 x 55) + 5 = 1,789 kcal

1,789 x 1.2 = 2,147kcal – 1,789 x 1.375 = 2,460 kcal

**Protein: 107g**

1.2 x 88.6kg = 106g – 53g needs to be HBV protein

GFR MDRD Calculator = 9 (Stage 5)

Sodium = 2,000 mg

Phosphorus = 800 – 1000mg

Potassium = 2,000 – 3,000mg

Fluid = 2,000mL

BMI = 25.2 (overweight) Energy intake selected is between Mifflin equation and KDOQI recommendations

The phosphorus in this plan is high at 1,419mg/day. It should be closer to 1,000 mg/day. This client should be prescribed a phosphorus binder because phosphorus is already at high levels in his blood. He should also be advised to select lower phosphorus high protein foods and avoid dairy.

### Food Choices for Dialysis (National Renal Diet)

Food Choices	No. Choices	Avg Pro	Pro (g)	Avg Na	Na (mg)	Avg K	K (mg)	Avg P	P (mg)	Avg Cals	Calories (kcal)
<b>Protein Choices</b>											
<b>Animal Protein</b>	11	7	77	85	935	100	1100	75	825	75	825
Higher sodium, potassium or phosphorus proteins		7	0	350	0	350	0	200	0	75	0
<b>Dairy and Phosphorus</b>		5	0	165	0	225	0	110	0	250	0
<b>Lower Protein Foods</b>											
<b>Vegetable Group 1</b>	3	2	6	15	45	85	255	40	120	25	75
<b>Group 2</b>		2	0	15	0	200	0	40	0	25	0
<b>Group 3</b>		2	0	15	0	400	0	40	0	25	0
<b>Fruit Choices</b>											
<b>Group 1</b>	1	0.5	0.5	5	5	85	85	11	11	60	60
<b>Group 2</b>	2	0.5	1	5	10	200	400	11	22	60	120
<b>Group 3</b>	1	0.5	0.5	5	5	400	400	11	11	60	60
<b>Breads, cereals, grains</b>	8	2.5	20	75	600	55	440	40	320	125	1000
Higher Sodium and/or Phosphorus grains		2.5	0	200	0	55	0	150	0	125	0
<b>Calorie Choices</b>	2	0.5	1	50	100	50	100	50	100	125	250
<b>Flavor Choices</b>	1	0	0	275	275	50	50	10	10	10	10
<b>Total</b>			<b>106</b>		<b>1975</b>		<b>2830</b>		<b>1419</b>		<b>2400</b>



-1/2  
↓ amt of animal protein

c. 60 year old female Ht: 5'5" (165cm) Weight: 195 pounds (89kg)  
BUN: 45 mg/dL (high) Creatinine: 1.8 mg/dL  
K: 3.7 mEq/L (normal) P: 4.8 mg/dL (high)  
Type 2 Diabetes

Sodium - 1,500 - 2,000 mg, Potassium - AI = 4,700 mg (do not need to restrict),  
Phosphorus - keep under 1,000mg and can give binder

**Calorie Range: 1,746 kcal - 3,115 kcal (using 2,000kcal)**  
35kcal x 89kg = 3,115 kcal

Mifflin:  $(10 \times 89) + (6.25 \times 165) - (5 \times 60) - 161 = 1,455 \text{kcal} \times 1.2 = 1,746$   
 $1,455 \times 1.375 = 2,001$

**Protein Range: 53g - 67g (at least 50% HBV)**

.6g x 89kg = 53g

.75g x 89kg = 67g

*> 41-51g using RBW  
use UBW - obese*

*(-1)*

Carbohydrates - 50%

.5 x 2,000kcal = 1,000kcal from CHO/4kcal/g = 250g CHO total

170g CHO used in meal plan - leaves 80g CHO for flavor and calorie choices lists

BMI = 32.7 (obese)

Calories being kept on the lower end due to obesity.

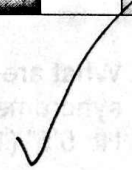
GFR MDRD Calculator = 29 (Stage 4)

The phosphorus in this plan is a little high at 1,014 mg/day. This client may need to be given a phosphorus binder with meals because phosphorus is already at high levels in her blood. She should also be advised to select lower phosphorus high protein foods and avoid dairy.

*Handwritten notes at bottom of page, including "GFR MDRD Calculator = 29 (Stage 4)" and other illegible scribbles.*

## Food Choices for CKD (National Renal Diet) and Type 2 Diabetes

Food Choices	No. Choices	Avg Pro	Pro	Avg Na	Na	Avg K	K	Avg P	P	Avg Cals	CHO g	Calories
			(g)		(mg)		(mg)		(mg)			(kcal)
<b>Protein Choices</b>												
High protein	4	7	28	85	340	100	400	75	300	75	0	300
Higher phosphorus proteins		7	0	85	0	200	0	200	0	75		0
Higher sodium proteins		7	0	325	0	100	0	75	0	75		0
Lower Protein Foods												
Vegetable Group 1	0	2.5	0	15	0	85	0	40	0	25		0
Group 2	0	2.5	0	15	0	200	0	40	0	25		0
Group 3	4	2.5	10	15	60	400	1600	40	160	25	20	100
Breads, cereals, grains	6	2	12	75	450	40	240	40	240	125	90	750
Fruit Choices :may be free pro												
Group 1	0	0.5	0	5	0	85	0	11	0	60		0
Group 2	0	0.5	0	5	0	200	0	11	0	60		0
Group 3	4	0.5	2	5	20	400	1600	11	44	60	60	240
Calorie Choices	5	0.5	2.5	50	250	50	250	50	250	125		625
Flavor Choices	2	0	0	275	550	50	100	10	20	10		20
<b>Total</b>			<b>54.5</b>		<b>1670</b>		<b>4190</b>		<b>1014</b>		<b>170</b>	<b>2035</b>



*Handwritten notes:*  
 4/11/14  
 8/19  
 [unclear]

2. Select a patient in question 1 and plan a sample menu, including portion sizes (6 points)

Choices from 1A: 4 High-protein, 4 vegetable, 4 fruit, 6 grain, 6 calorie, 2 flavor ✓

Sample Renal Menu Person A				
Meal	Food Group	Number of Choices	Food	Portion Size
Breakfast	Grain	2	English Muffin	1 Muffin
	Calorie	1	Raspberry Jam	2 TBSP
	Calorie	1	Margarine	1 TBSP
	Fruit	2	Honeydew Melon	1 Cup
	N/A		Water	16 oz
Snack	Fruit	1	Orange	1 Orange
	N/A		Water	8 oz
Lunch	Grain	2	Whole wheat bread	2 Slices
	High-Protein	1	Peanut Butter	2 TBSP
	Fruit	1	Banana	1 Small
	Calorie	1	Fruit Drink	1 Cup
	Grain	1	Pretzel Sticks (unsalted)	10 Sticks
Snack	Grain	1	Graham Crackers	3 Squares
	Calorie	1	Fruit Roll-up	2 Roll-ups
	N/A		Water	16 oz
Dinner	High-Protein	3	Chicken Breast	3 oz
	Flavor	1	Barbecue Sauce	2 TBSP
	Vegetable	2	Brussels Sprouts, roasted	1 Cup
	Calorie	1	Vegetable Oil	1 TBSP
	Vegetable	2	Sweet Potato, baked	1 Cup
	Calorie	1	Margarine	1 TBSP
	Flavor	1	Salt	1/8 TSP
	N/A		Water	16 oz

3. What are your diet recommendations for a 60 year old female with nephrotic syndrome and anasarca (generalized edema). (4 points)

Ht: 5'5" (165cm) Weight: 175 pounds (80kg) UBW: 150 pounds (68kg)

$$\text{Mifflin: } (10 \times w) + (6.25 \times h) - (5 \times a) - 161$$

$$\text{UBW: } (10 \times 68) + (6.25 \times 165) - (5 \times 60) - 161 = 1,251 \text{ kcal} \times 1.2 = 1,502 \text{ kcal}$$

$$1,251 \text{ kcal} \times 1.375 = 1,720 \text{ kcal}$$

$$\text{CBW: } (10 \times 80) + (6.25 \times 165) - (5 \times 60) - 161 = 1,365 \text{ kcal} \times 1.2 = 1,638 \text{ kcal}$$

$$1,365 \text{ kcal} \times 1.375 = 1,877 \text{ kcal}$$

Calorie Range: UBW: 1,502 kcal – 2,389 kcal

$$35 \text{ kcal} \times 68\text{kg} = 2,389 \text{ kcal}$$

1/2

don't do  
20 to  
anasarca

Protein .8g x 68kg = 54g protein (Half needs to be HBV)

~~CBW BMI: 29.1 (overweight); UBW BMI: 25 (overweight)~~  
*Don't even calculate*

**Recommendation:** First, I would try to get a physician to determine what the nephrotic syndrome is related to. This condition can be a result of autoimmune diseases, medications or diabetes. If the client is diabetic, the diet recommendation would change. If diabetes is not present, I would start her on a 1,700 kcal, protein controlled diet (about 54g), 27g or more should be HBV protein. Her current BMI of 29.1 is overweight. Her weight gain is likely related to fluid build-up from anasarca, however her usual body weight BMI of 25 is also considered overweight. For this reason, I decided to keep her calorie level in the middle of the range. Weight should be monitored and the calorie level should be adjusted if needed. MNT should focus on reducing the anasarca and replacing the nutrients she is losing in her urine. Potassium and phosphorus should not need to be restricted. Sodium should be limited to between 1,000 – 2000mg to help reduce the anasarca. Calcium should be between 1,000mg – 1,300mg. Additionally, she should consume 1,000 – 1,500mL of fluid each day.

4. Calculate a continuous tube feeding for 1 a and an intermittent tube feeding for 1b. (10 points)

#### Continuous Tube Feeding For 1 A

**Calorie Range: 1,758 kcal – 2,695 kcal**

**Protein Range: 46g – 58g**

BMI = 25.6 (overweight)

Formula: Suplena – for CKD without dialysis

$$\frac{50g \text{ protein}}{x} = \frac{44.7g \text{ Protein}}{1L} \times 1.119L \times 1,000mL/L = 1,119mL$$

$$1,119mL \times 1.8kcal/mL = 2,013 \text{ kcal}$$

Fluid = unrestricted due to assumed normal urine output

$$\text{Water needs} = 1.2mL \times 2,013kcal = 2,416mL$$

$$\text{Water in Suplena (73.8\%)} = 1L = 738mL \quad 1.119L \times 738mL = 826 \text{ mL water}$$

$$2,416 \text{ mL} - 826 \text{ mL} = 1590mL \text{ additional water needed}$$

$$\text{Sodium} = 1.119L \times 35mg = 39mg$$

$$\text{Potassium} = 1.119L \times 29mg = 32mg$$

$$\text{Phosphorus} = 1.119L \times 717mg = 802mg$$

$$12.6g \text{ fiber/L} \times 1.119L = 14g \text{ Fiber (low)} - \text{supplement with Benefiber}$$

25g = AI for Fiber for 45 yr, woman

$$3 \text{ packets (3TBSP) Benefiber} = 16kcal \times 3 = 48kcal + 2,013kcal = 2,061kcal \text{ total}$$

Protein = 0g  
Phosphorus =  $15\text{mg} \times 3 = 45\text{mg} + 802\text{mg} = 847\text{mg}$  Phosphorus – still okay  
Fiber  $3\text{g} \times 3 \text{ packets} = 9\text{g} + 14\text{g} = 23\text{g}$  Fiber

$1,119\text{mL}/24\text{hrs} = 46.6\text{mL} = 45\text{mL}/\text{hr}$

$45\text{mL}/\text{hr} \times 24 = 1,080\text{mL}$

$1.08\text{L} \times 44.7 = 48\text{g protein}$

$1,080 \times 1.8\text{kcal}/\text{mL} = 1,944\text{kcal} + \text{Fiber kcal} (48\text{kcal}) = 1,992 \text{ kcal total}$

**Recommendation: Feed 1,080mL of Suplena per day continuously. Initiate at 25mL per hour. Increase 20mL every 8 hours until goal of 45mL/hour is reached. Provide 65mL of water every hour or 130mL of water every 2 hours. Also provide 3 packets of Benefiber throughout the day.** ✓

### Intermittent Tube Feeding For 1 B

**Calorie Range: 2,147 kcal – 3,115 kcal**

**Protein: 107g**

BMI = 25.2 (overweight)

Formula – Nepro – for Dialysis

$\frac{107\text{g protein}}{x} = \frac{81\text{g Protein}}{1\text{L}} \times 1.32 \text{ L} \times 1,000\text{mL}/\text{L} = 1,320\text{mL}$

$1,320\text{mL} \times 1.8 \text{ kcal}/\text{mL} = 2,376 \text{ kcal}$

Phosphorus =  $1.32\text{L} \times 720\text{mg}/\text{L} = 950.4\text{mg}$  (Okay – under 1,000)

Sodium =  $1.32\text{L} \times 46\text{mg}/\text{L} = 60.72\text{mg}$  (Okay – under 2,000)

Potassium =  $1.32\text{L} \times 27\text{mg}/\text{L} = 35.64\text{mg}$

Fiber  $1.32\text{L} \times 12.6\text{g}/\text{L} = 16.6\text{g}$  Fiber – do not supplement due to fluid restriction

Water needs =  $1.2\text{mL} \times 2,376 \text{ kcal} = 2,851\text{mL}$

Water in Nepro (72.7%) =  $1\text{L} = 727\text{mL}$   $1.32\text{L} \times 727\text{mL} = 960 \text{ mL water}$

$2,851\text{mL} - 960\text{mL} = 1,891 \text{ mL water}$

But urine output is  $1,000 + 1,000 = 2,000$  total fluid needs

$2,000 - 1320 = 680\text{mL}$  fluid additional allowed

$1320\text{mL}/240\text{mL}$  in a can = 5.5 cans → go up to 6 cans (117g Protein, 2,592kcal – still within calorie range, protein is a little high, phosphorus 1036mg – put on phosphorus binder).

**Recommendation: Administer 6 cans of Nepro 3x a day: 2 cans, 2 cans, 2 cans. Flush with 30mL of water before and after each feeding (180mL total). Provide an additional 500mL of water throughout the day. Provide patient with a phosphorus binder at meal times.**