

Harriet Nells Case Study Answer Key: Hypertension and CKD

Objectives

1. Student will be able to identify chronic kidney disease (CKD) using the estimated glomerular filtration rate (eGFR) and urine albumin-to-creatinine ratio (UACR).
2. Student will associate improved blood pressure control with reduced risk for of CKD progression.
3. Student will be able to identify the recommended sodium intake for CKD.

Background

Mrs. Nells is a 58-year-old African American with pre-diabetes, hypertension, and CKD. Her mother is deceased (hypertension and diabetes); father has hypertension. Her doctor told her to stop eating salty foods and she is trying to use less salt.

She is worried about diabetes and wants to lose weight.

She teaches 5th grade and usually eats school lunch when working and reports portions are too small. She has no time for exercise as she cares for her father after work and on weekends. Her husband prepares supper and makes fried foods and adds salt. They eat out once a week at the most.

No alcohol. No tobacco.

Physical exam: obese with some lower leg edema. Good dentition. No obvious nutrient deficiencies.

MNT Referral Data

Labs: A1c 5.9, UACR 65 (was 120), creatinine 1.2, eGFR 56, K 4.3, HCO₃ 27.8, BUN 16, Ca 9.0, Phos 4.3, Hgb 13.8, LDL 131, HDL 37, TG 165, Alb 3.6

Medications: baby aspirin, simvastatin 20 milligrams (mg) daily, hydrochlorothiazide 25 mg daily, lisinopril 20 mg daily

Recall

1 large buttermilk biscuit/butter 2 fried eggs 2 sausage links 12 oz. hot tea with sugar	1 baked chicken leg ½ c. mashed potatoes/ gravy ½ c. green beans, canned Tomato slices ½ c. apple crisp 16 oz. canned iced tea with sugar	4 oz. fried fish 3 hush puppies Large baked sweet potato with butter ½ c. coleslaw 16 oz. homemade sweet tea
Snacks on canned sausage with low salt crackers.		

Questions

For additional information, see noted slides from **Chronic Kidney Disease 101: Nutrition Intervention**, available at <http://nkdep.nih.gov/resources/ckd-101-nutrition-508.ppt>.

1. Use NKDEP's *How well are your kidneys working? Explaining your kidney test results* (<http://nkdep.nih.gov/resources/explaining-kidney-test-results-508.pdf>) and Mrs. Nells's MNT referral (<http://nkdep.nih.gov/resources/nells-case-study-mnt-referral-508.pdf>) to identify the parameters indicating Mrs. Nells has CKD.

Answer: c. She has an increased UACR and decreased eGFR.

2. Which of the following strategies is key to slowing CKD progression?

Answer: a. Control blood pressure.

For additional information, see slide 27.

3. What is your initial dietary recommendation for her? Why?

Answer: The physician referred her for uncontrolled blood pressure and CKD, and told her to lower salt intake. Evidence supports blood pressure control as a priority for slowing CKD progression. She has lower leg edema which may improve with sodium restriction. Preventing diabetes may be her priority and is appropriate. However, she already has an elevated UACR and reduced eGFR indicating CKD. Her sodium intake exceeds the recommended 2,400 milligrams for CKD. Sodium restriction will enhance efficacy of renin-angiotensin-aldosterone (RAAS) antagonists (lisinopril) and may also lower urine albumin excretion. Reducing calories and limiting sugary beverages for weight loss may also lower blood pressure and may delay diabetes.

For additional information, see slides 25 (notes) and 27.

4. List 3 diet changes to recommend to her.

Use NKDEP's *Eating Right for Kidney Health* (<http://nkdep.nih.gov/resources/eating-right-508.pdf>) and/or *Sodium: Tips for People with Chronic Kidney Disease* (<http://nkdep.nih.gov/resources/nutrition-sodium-508.pdf>).

Answer:

- Use spices and herbs in place of salt in cooking. Ask husband not to add salt when cooking.
- Reduce intake of processed meats high in sodium, such as sausage links and canned sausage.
- Use no added salt canned vegetables, or rinse regular canned vegetables before re-heating.
- Have buttermilk biscuits less often. If homemade, make them smaller and eat only one. If store bought, compare different brands for sodium content and choose the one with less sodium.

For additional information, see slides 49, 50, 86.

At the end of the appointment, she stated she will decrease sodium intake and will try sugar-free beverages to reduce calories and weight. She will return in 2 months.

5. Provide documentation for the visit.

Answer:

A.	<i>58-year-old African American female with uncontrolled hypertension, albuminuria, and newly diagnosed pre-diabetes. Ht 65", Wt 203#, BP 168/105. Pertinent labs: UACR 65, A1C 5.9</i>
D.	Excessive sodium intake related to high sodium food choices as evidenced by edema and diet recall indicating intake of many sodium-rich foods compared to recommended 2,400 milligrams sodium. Excessive carbohydrate intake related to consumption of beverages with added sugars.
I.	Nutrition education, priority modification and relationship to health and disease. Low sodium diet and relationship to controlling blood pressure and slowing CKD progression. Reduction of sugary beverages and relationship to controlling weight and blood glucose.
M&E	Short term: Verbally defined goals: reduce sodium intake and try sugar-free beverages Long term: Reduce weight

Follow Up with Mrs. Nells

Mrs. Nells returns in two months as scheduled. She reduced sodium intake by eliminating salt at the table and eats biscuits and sausage only once a month. Her husband buys reduced or low sodium products for the family and bought salt substitute to use in cooking and at the table. She is now used to artificial sweeteners. She walks at least 15 minutes most days and finds this help with stress.

Her legs show no edema. Medications have not changed.

Review of Pertinent Measures

Measure	March 2012	Dec. 2011
Weight (lb.)	197	203
Blood Pressure	135/80	168/105
Hemoglobin A1C	5.7	5.9

Current labs: creatinine 1.1, eGFR > 60, UACR 26, K 4.8, HCO₃ 26.4, BUN 15, Ca 9.0, Phos 4.2, Alb 3.7, random blood sugar 107

Previous labs: creatinine 1.2, eGFR 56, UACR 65, K 4.3, HCO₃ 27.8, BUN 16, Ca 9.0, Phos 4.3, Alb 3.7 (from initial referral)

Recall

1/2 c. orange juice 2 boiled eggs/salt substitute 2 slices whole wheat toast, dry 12 oz. hot tea/sugar substitute	1 slice cheese pizza (school lunch) 3/4 c. tossed salad/ ranch dressing 1/2 c. fruit cocktail 16 oz. sugar-free canned tea	3 oz. oven-fried chicken 1 c. mashed potatoes/salt sub. 1/2 c. collard greens, fried in oil 1 small buttermilk biscuit 16 oz. tea /sugar substitute
When hungry, her afternoon snack is a small bowl of reduced-sodium vegetable soup.		

Additional Questions

6. Which clinical data demonstrates the initial intervention was successful?

Answer: Blood pressure is lower (135/80, was 168/105). Weight is down (197#, was 203#) and edema is no longer present. Her eGFR is stable (>60, was 56) and not decreasing. UACR improved (26, was 65) and A1C decreased (5.7, was 5.9).

7. Identify trend(s) in lab data and medication associated with potential food-medication interaction. Describe intervention.

Use NKDEP's *Eating right for kidney health* (<http://nkdep.nih.gov/resources/eating-right-508.pdf>) and/or *How to read a food label* (<http://nkdep.nih.gov/resources/nutrition-food-label-508.pdf>).

Answer: Serum potassium is trending up from 4.3 to 4.8. This does not require a potassium restriction. She takes lisinopril, an ACE inhibitor that increases the risk of hyperkalemia in CKD. Salt substitutes may not be appropriate for people with CKD due to the potassium content. She needs to read ingredient list on reduced sodium products to determine if potassium chloride is used to lower sodium content. Discuss how to read the ingredient list on lower sodium products to determine if potassium chloride is used in place of salt.

For additional information, see slides 27, 28 (notes), 76.

Educational Material

National Kidney Disease Education Program. *How well are your kidneys working? Explaining your kidney test results*. Revised February 2012. NIH Publication No. 12–6220. National Kidney Disease Education Program website. <http://www.nkdep.nih.gov/resources/explaining-kidney-test-results-508.pdf>

National Kidney Disease Education Program. *Sodium tips for people with chronic kidney disease (CKD)*. Revised September 2011. NIH Publication No. 11–7407. National Kidney Disease Education Program website. <http://nkdep.nih.gov/resources/nutrition-sodium-508.pdf>

National Kidney Disease Education Program. *Eating right for kidney health*. Revised September 2011. NIH publication No. 11–7405. National Kidney Disease Education Program website. <http://nkdep.nih.gov/resources/eating-right-508.pdf>

National Kidney Disease Education Program. *How to read a food label*. June 2010. NIH Publication No. 10–7407. National Kidney Disease Education Program website. <http://nkdep.nih.gov/resources/nutrition-food-label-508.pdf>

National Kidney and Urological Diseases Information Clearinghouse. *High Blood Pressure and Kidney Disease*. Washington, D.C.: U.S. Government Printing Office, July 2008. NIH Publication No. 08–4572. http://kidney.niddk.nih.gov/kudiseases/pubs/highblood/highblood_508.pdf

Additional Reading

Jolly SE, Rios Burrows N, et al. Racial and ethnic differences in albuminuria in individuals with estimated GFR greater than 60 mL/min/1.73 m²: Results from the Kidney Early Evaluation Program (KEEP). *American Journal of Kidney Diseases*.2010; 55(3)Suppl 2: S15–S22.

Lancaster KJ. Dietary treatment of blood pressure in kidney disease. *Advances in Chronic Kidney Disease*. 2004; 11(2):217–221.

Lin J, Hu FB, Curhan GC. Associations of diet with albuminuria and kidney function decline. *Clinical Journal of the American Society of Nephrology*. 2010; 5(5): 836–843.

Udani SM, Koyner JL. Effects of blood pressure lowering on markers of kidney disease progression. *Current Hypertension Reports*. 2009; 11(5):368–374.

Ruggenti P, Cravedi P, Remuzzi G. The RAAS in the pathogenesis and treatment of diabetic nephropathy. *Nature Reviews Nephrology*. 2010;6(6):319–330.



For more information, visit www.nkdep.nih.gov/nutrition or call 1-866-4 KIDNEY (1-866-454-3639).

The National Kidney Disease Education Program (NKDEP) works to improve the understanding, detection, and management of kidney disease. NKDEP is a program of the National Institutes of Health.

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