

Food for Thought

Diet and the Kidney



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KEYWORDS

• Renal diet • Potassium • Protein • Bicarbonate • Supplementation • Antioxidants

KEY POINTS

- Adherence to kidney diet guidelines is an inexpensive way to promote kidney health and decrease morbidity.
- The most impactful dietary changes in patients with chronic kidney disease (CKD) are limiting sodium and increasing bicarbonate.
- Increasing dietary fiber in patients with CKD can decrease serum urea and serum creatinine, which slows the progression of the disease.

The kidney diet has been the bane and the promise of patients with kidney disease for decades. From the original 1945 dietary guidelines from the Food and Nutrition Board of the National Academy of Sciences exhorting children to drink 8 glasses of water per day to the present knowledge that overconsumption of water can be dangerous, the renal diet has been adjusted, enhanced, and debated.^{1–3} Nephrology continues to develop, especially with regard to the relationship between nutrition and chronic kidney disease (CKD). There has been an influx of data published since the turn of the century as well as dietary guidelines developed by the kidney community both in the United States and internationally. Because it is difficult to keep up with evolving theories, beliefs, and the most recent research, many practitioners will follow what they learned in training. This article serves as a dietary primer for the non-nephrology PA by outlining the peer-reviewed, best practices that are available and encouraged for your patients with kidney disease in 2016.

MODIFICATION OF DIET IN RENAL DISEASE STUDY

Protein is acknowledged as an early marker of nephrotic syndrome. The belief that managing protein would slow kidney disease was the basis of a long-term research study of patients with kidney disease in the United States and Canada, the Modification of Diet in Renal Disease, more commonly known by its acronym the MDRD study.⁴ In the early 1990s, nephrology asked the following question: does protein restriction

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matter? In what is now a landmark study, 840 patients with an elevated serum creatinine were enrolled in a randomized, multicenter National Institute of Health–sponsored study to answer exactly that question.⁵ In this study, patients were given either a usual-protein diet (1.3 g/kg/d) or a low-protein diet (0.58 g/kg/d). For the next 2 to 5 years, the rate of decline of kidney function was followed; it was found that there was little difference between the groups. This finding started the long discussion and debate in the kidney community about dietary protein.

PROTEIN

The MDRD study results set off multiple secondary analyses of the same data.⁶ In a meta-analysis of the data as reviewed by multiple experts, Levey and colleagues⁶ stated that many investigators thought there was no correlation between protein restriction and the progression of kidney disease. However, after reviewing the data themselves, Levey and colleagues⁶ concluded that there was some justification in recommending a low-protein diet. They specified 0.6 g/kg/d as the optimum protein restriction for patients with kidney disease. This recommendation was taught throughout the medical community, and many professors and instructors still teach this to their students. However, since that publication in 1999, new data have emerged challenging this recommendation.

Realistically, many patients cannot calculate or restrict protein in their diets. Furthermore, many of the same patients who have kidney disease also have diabetes whereby higher protein intake is often recommended. Patients on dialysis, either hemodialysis or peritoneal dialysis, are told to increase protein intake as studies have shown that supplementing patients on dialysis with protein will increase survival.⁷ However, admitting practitioners in hospitals will often order a renal diet for patients on dialysis, which may, depending on the institution, include a protein restriction. Dietitians have addressed this issue with computerized order sets that include various subsets of renal diets: the dialysis renal diet does not include protein restriction.

That said, recent guidelines suggest that patients with CKD with a glomerular filtration rate (GFR) less than 60 mL/min still should have some protein restriction. In 2012, Kidney Disease Improving Global Outcomes (KDIGO), an international group of kidney experts (including those in the United States), looked at data and research from around the world. These experts developed a set of guidelines for the management of patients with CKD.⁸ Included are guidelines for known complications (**Table 1**). As this is the most robust set of guidelines available, they are accepted as the final word on protein for patients with CKD at this time and are considered standard of care.

GFR (mL/min)	>90	60–89	45–59	30–44	<30
Anemia (%)	4	5	125	23	51
Hypertension (%)	18	41	72	78	82
Vitamin D deficiency (%)	14	9	11	11	27
Acidosis (%)	11	8	9	18	31
Hyperphosphatemia (%)	7	7	9	9	23
Hypoalbuminemia (%)	1	1	3	9	7
Hyperparathyroidism (%)	5	9	23	44	72

Adapted from Kidney Disease: Improving Global Outcomes (KDIGO) CKD Work Group. KDIGO 2012 Clinical Practice Guideline for the Evaluation and Management of Chronic Kidney Disease. *Kidney inter Suppl* 2013;3:1–150.

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