

Renal-diabetes nutrition: bridging the gap between dietary guidelines and patient experiences

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Abstract

Chronic kidney disease (CKD) and diabetes mellitus (DM) often coexist and pose distinctive dietary difficulties for patients. While CKD recommendations underscore nutrient limitations, specifically for potassium and phosphate, diabetes dietary guidelines highlight balanced carbohydrate consumption, and increased intake of fruit and vegetables. These interrelating yet conflicting needs cause stress and confusion among patients, often resulting in poor dietary compliance. Advances in renal nutrition recommendations promote a more flexible and personalized approach, identifying the lower bioavailability of potassium in whole foods and the substantial contribution of food additives to nutrient surplus. These advances enable higher compliance with diabetes dietary principles and support plant-based approaches that enhance both glycaemic and renal outcomes. Nonetheless, dietary management remains disintegrated, with renal and diabetes dietitians usually working independently, since there is no integrated training pathway for dietitians to obtain dual expertise. A multidisciplinary approach is crucial, and training individual dietitians with unified proficiencies could rationalize care, reduce patient confusion and improve patient outcomes. This review delves into the clinical evolution of renal-diabetes dietary guidance, patient experiences, and the urgent need for cohesive and collective dietetic care.

Key words: renal-diabetes nutrition, chronic kidney disease, dietary guidelines, nutrition adherence

Introduction

Diabetes is the primary cause of kidney failure in the UK: one in three people with diabetes develop diabetic kidney disease (DKD). In England and Scotland, diabetic nephropathy reportedly results in kidney failure in about 30% of patients, necessitating kidney replacement

therapy.¹ The coexistence of diabetes and chronic kidney disease (CKD) poses unique nutritional challenges for patients and healthcare providers (HCPs).² Both conditions warrant careful dietary management to alleviate complications, yet they are often accompanied by conflicting dietary recommendations, further adding to patient confusion and challenges in care.^{2,3} For instance, while diabetes guidelines encourage the intake of fruit, vegetables, pulses, lentils, nuts, seeds and whole grains,^{4,5} renal diets often limit the same things owing to concerns about their high potassium and phosphate content. This dual challenge creates a significant barrier to achieving optimal nutritional outcomes.⁵

Effective dietary management is crucial in diabetes and CKD as it directly influences glycaemic control, protects kidney function, and improves cardiovascular health and overall quality of life. Recent advancements in renal dietary guidelines, such as the Kidney Disease Improving Global Outcomes (KDIGO) 2024 and the Joint British Diabetes Society (JBDS) 2023 recommendations, suggest more flexible approaches to renal nutrition,⁶ seeking to balance potassium and phosphate management with the wider nutritional needs of diabetic CKD patients, thus making dietary compliance more achievable without compromising health outcomes.⁶

The purpose of this review is to highlight the dual challenges in managing renal-diabetes nutrition, emphasizing the significance of progressing dietary approaches that address the distinct needs of this patient population.

Patient perspective: challenges in dietary management for coexisting diabetes and CKD

For patients with CKD and diabetes, following dietary recommendations can be an overwhelming experience. The volume of advice, ranging from carbohydrate counting for diabetes to

potassium and phosphate limitations for CKD, typically results in uncertainty and stress. Many patients become confused about what to eat, with common concerns including whether to avoid potassium-rich foods or prioritize fibre; or how to balance protein for kidney health with carbohydrates for managing blood sugar.^{5,7}

Beyond the practical challenges, food holds deep emotional and social importance. It depicts comfort, tradition, joy and connection with loved ones. Dietary restrictions can disturb these aspects of life, leading to feelings of loneliness or irritation. For instance, patients may find it difficult to attend food-centred social gatherings or feel withdrawn when they are unable to enjoy their favourite meals.⁸

This combination of practical challenges and emotional burden underscores the need for customized dietary management that deals with medical prerequisites, while also considering the patient's lifestyle, preferences and emotional well-being. Empowering patients with appropriate dietary education can help to navigate these difficulties effectively while maintaining their quality of life.^{9,10}

Evolution of renal dietary guidelines

Renal dietary recommendations have transformed significantly over the years. Historically, renal diets were less flexible whilst advocating strict potassium and phosphate restrictions. This was particularly challenging for patients with coexisting diabetes, as it required limiting nutrient-rich foods like fruit, vegetables, legumes and whole grains that would otherwise be beneficial in diabetes management and cardiovascular health (Table 1).¹¹

While there have been significant medical and technological advancements in diabetes management, dietary recommendations have remained relatively consistent.¹² However, in recent

Table 1. Evolution of renal dietary recommendations^{1,12}

Diabetes diet advice	Historical renal diet advice	New renal diet advice
Eat plenty of vegetables and salads	Limit vegetables and salad for their high potassium content	Encourage at least five portions of low-potassium fruit and vegetables/day
Lentils and pulses encouraged	Limit lentils and pulses for their high potassium content	Tinned lentils/pulses after draining the water Plant-based diets encouraged
Vegetables can be cooked using any cooking method	Boil or double-boil vegetables to reduce their potassium content	Double boiling not advised. Boil vegetables where appropriate
Whole grains encouraged	Limit whole grains for their high phosphorus content	Encouraged to have wholegrains

years, with new research and evidence, renal dietary guidelines have evolved. This is in response to changes in eating habits, particularly the growing reliance on processed foods, which are cheap and easily available. The shift in guidelines is a positive development, making the management of a renal-diabetes diet easier. Though it is still challenging, the approach is now more flexible than it was just a few years ago.

The recent KDIGO 2024 guidelines and the JBDS 2023 guidance support a more customized approach rather than generalized food exclusions.^{6,13} The evolution of these recommendations depicts a growing realization that not all patients with DKD require extensive dietary restrictions. The current guidance focuses on positioning dietary recommendations with comprehensive health goals, such as glycaemic control, cardiovascular safety, and safeguarding renal function.^{6,11,13}

Importantly, the emerging evidence and updated guidelines facilitate enhanced integration of renal and diabetes nutrition management. This alignment is expected to reduce patient confusion regarding dietary recommendations and help to achieve a nutritionally balanced diet.⁶

Potassium management in renal-diabetes diets

Potassium management is the basis of dietary care in CKD, but recent perceptions on potassium bioavailability have triggered a more refined evaluation. Conventionally, foods high in potassium, particularly fruit and vegetables, were

limited in renal diets to prevent hyperkalaemia. However, evidence shows that potassium absorption varies depending on the type of food consumed. For instance, potassium in whole foods is less bioavailable due to the presence of dietary fibre that resists digestion in the human gut, leading to potassium absorption of only 50-60%.¹⁴⁻¹⁸ Furthermore, dietary fibre aids faecal potassium excretion and plant-derived alkali drives potassium into cells, particularly during metabolic acidosis.¹⁶ Also, complex carbohydrates in whole foods improve insulin-induced potassium absorption, further avoiding hyperkalaemia.¹⁹

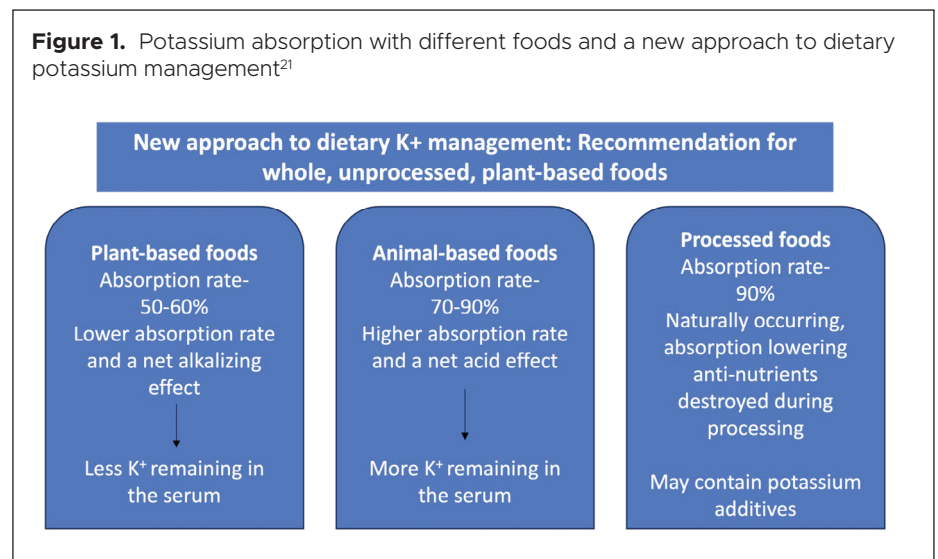
By contrast, potassium additives in processed foods (including some stabilizers, thickeners or preservatives) are almost 100% bioavailable.¹⁹ These are frequently found in items including processed meats, ready-made sauces

and baked goods, all of which are less obviously linked with high potassium intake yet disproportionately add to the potassium load.¹⁴⁻¹⁶ With increasing pressure to lower sodium in food sources, manufacturers are reducing sodium chloride (NaCl) and replacing it with potassium-based salts, such as potassium chloride. However, low-sodium salts can be deceptively high in potassium, and the resulting potassium concentration with potassium-based additives may exceed that of natural sources. This poses a risk, particularly for patients with CKD, in whom lowered renal potassium excretion can potentially cause hyperkalaemia.²⁰ Creating awareness around food processing and reading labels are crucial elements of successful potassium management in renal-diabetes care.

Figure 1 represents the new approach for dietary potassium management and shows potassium absorption from different foods.²¹

Therefore, a stepwise approach to effective potassium management in CKD and diabetes begins with recognizing and addressing non-dietary causes of hyperkalaemia, including medicines, metabolic acidosis or insulin dysfunction. Simultaneously, patients must be empowered through increased awareness about the high bioavailability of potassium additives in processed foods, and urged to read food labels, reduce their intake of such foods, and choose lower-potassium whole foods such as fruit, vegetables and legumes.

Figure 1. Potassium absorption with different foods and a new approach to dietary potassium management²¹



These foods, regardless of their potassium content, offer lower bioavailability while offering more benefits, including natural alkali and improve insulin sensitivity. Moreover, evidence indicates that whole, unprocessed fruits and vegetables are more beneficial than processed forms such as juice, dried fruits, and canned products that are higher in sugar, as they help with better potassium management, glycaemic control and overall renal health.²¹ This balanced dietary approach to manage hyperkalaemia reinforces both glycaemic control and cardiovascular health while avoiding unwarranted dietary restrictions.¹⁴⁻¹⁹

Phosphate management: organic vs. inorganic phosphate

As with potassium, phosphate presents a unique concern in renal-diabetes management due to its double impact on kidney and cardiovascular health. However, all phosphate sources are not equal. Organic phosphate, which occurs naturally in meats, dairy, whole grains and legumes, has inconsistent absorption rates (usually 40-70%).²² Plant-based phosphate (phytates) has a lower absorption rate due to its indigestible constitution in the human gut. Also, inorganic phosphate from food preservatives, typically found in processed meats and cheeses, carbonated beverages and instant foods, is highly absorbable (up to 90-100%), which can significantly elevate serum phosphate levels. These preservatives are widely used in the food industry and are often mentioned on food labels. For instance, in the UK, they are mentioned as ingredients with “phos” or “phosph” or with E-numbers such as E338-E341, E343 and E450-E452.²³⁻²⁶

Effective management of phosphate intake requires a two-in-one approach, restricting processed and ultra-processed foods while retaining appropriate protein intake from natural, healthy sources. For instance, limiting ultra-processed foods such as cola drinks and processed meats with additives instead of limiting foods with high nutritive value like dairy, legumes and pulses. This approach makes it easier for patients to maintain a nutritionally

compliant diet without unnecessary deficiency, and is especially important for patients with diabetes, who may already feel constrained by dietary rules.²²

Metabolic acidosis and dietary interventions

Metabolic acidosis is a common yet often undervalued complication of CKD, aggravated by modern dietary arrangements with high acid-producing foods, specifically animal proteins, and low in alkalinizing foods, including fruits and vegetables. This prolonged state of low-grade acidosis has widespread consequences, such as worsening insulin resistance, faster kidney function decline and increased risk of cardiovascular disease, all vital concerns for DKD patients.¹⁷

Dietary approaches seeking to reduce acid load, mainly by increasing the intake of alkalinizing foods, are now identified as efficient supplements to clinical therapy. Fruits and vegetables encompass metabolizable anions, like citrate and malate, that counteract acid in the body. They also provide glutamate, an alkalinizing amino acid. In contrast, animal-based foods are acidogenic owing to their high content of sulphur-containing amino acid.²⁷

A low-acid, plant-based diet aids correction of metabolic acidosis and promotes improved glycaemic control and cardiovascular outcomes. Introducing fruits and vegetables, when possible, can enhance patient well-being, dietary fulfilment and disease outcomes. Rather than swapping high-potassium fruits with low-potassium alternatives as an immediate response, clinicians are recommended to first examine non-dietary contributors to hyperkalaemia and to reevaluate the need for such limitations on individual patients' requirements.^{17,28}

A dietitian's perspective on dietary management of CKD and diabetes

Diabetes and CKD frequently coexist, yet dietetic care often remains disintegrated, with renal and diabetes dietitians working separately.²⁹ This siloed model not only makes care coordination difficult but also confuses patients unnecessarily, who then

have consultations with multiple experts for interrelated dietary concerns. A more cohesive approach, where one dietitian is proficient in both renal and diabetes nutrition, could simplify care, reduce patient confusion and enhance dietary compliance. While well-defined competency guidelines and advanced training prospects exist separately for each specialty,^{30,31} no integrated course currently offers dual guidance. Lack of such a pathway warrants close partnership between renal and diabetes dietitians through a multidisciplinary approach. Empowering individual dietitians with dual proficiency can prove beneficial in bridging the gap between dietary recommendations and the real-world concerns faced by patients who have both conditions.

Conclusion

The dietary management in patients with both diabetes and CKD has transformed, in that it is more flexible and individualized, bringing renal and diabetes dietary advice into alignment.

Understanding the bioavailability of potassium and phosphate, identifying the role of food additives, addressing diet-induced acidosis, and encouraging whole grain, fruit and vegetable intake are vital elements of modern renal-diabetes care. The shift toward personalized nutrition analysis, driven by patient values, clinical data and cultural context, is transforming the delivery of dietary care. Going forward, dietitians should be competent in dietary care for both CKD and diabetes, while collective management between renal and diabetes teams should be vigorously promoted to provide combined education and enhance patient outcomes.



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References

1. Kidney Research UK. UK diabetes and kidney charities team up to establish key research and healthcare recommendations for diabetic kidney disease. Accessed on 9th April 2025. Available online at: <https://www.kidneyresearchuk.org/2025/03/05/uk-diabetes-and-kidney-charities-team-up-to-establish-key-research-and-healthcare-recommendations-for-diabetic-kidney-disease/>
2. Kumar M, Dev S, Khalid MU, *et al.* The bidirectional link between diabetes and kidney disease: mechanisms and management. *Cureus* 2023;**15**(9):e45615. <https://doi.org/10.7759/cureus/46515>
3. Ko GJ, Kalantar-Zadeh K, Goldstein-Fuchs J, Rhee CM. Dietary approaches in the management of diabetic patients with kidney disease. *Nutrients* 2017; **9**(8):824. <https://doi.org/10.3390/nu9080824>
4. Delahanty LM. Patient education: Type 1 diabetes and diet (Beyond the Basics). 2025. Accessed on 9th April 2025. Available online at: <https://www.uptodate.com/contents/type-1-diabetes-and-diet-beyond-the-basics/print#:~:text=A%20diet%20that%20includes%20carbohydrates,of%20carbohydrate%20intake%20is%20uncertain.>
5. Rhee CM, Kalantar-Zadeh M, Moore LW. Medical nutrition therapy for diabetic kidney disease. *J Renal Nutr* 2021;**31**(3): 229-32. <https://doi.org/10.1053/j.jrn.2021.03.004>
6. Kidney Disease: Improving Global Outcomes (KDIGO) CKD work group. KDIGO 2024 clinical practice guideline for the evaluation and management of chronic kidney disease. *Kidney Int* 2024; **105**(4S):S117-S314. <https://doi.org/10.1016/j.kint.2023.10.018>
7. Reynolds A, Mitri J. Dietary advice for individuals with diabetes. [Updated 2024 Apr 28]. In: Feingold KR, Ahmed SF, Anawalt B, *et al.*, editors. Endotext [Internet]. South Dartmouth (MA): MDText.com, Inc.; 2000-. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK279012/>
8. Puchulu, MB, Garcia-Fernandez N, Landry MJ. Food insecurity and chronic kidney disease: considerations for practitioners. *J Renal Nutr* 2023;**33**(5): 691-7. <https://doi.org/10.1053/j.jrn.2023.06.001>
9. Narva AS, Norton JM, Boulware LE. Educating patients about CKD: the path to self-management and patient-centered Care. *Clin J Am Soc Nephrol* 2016;**11**(4):694-703. <https://doi.org/10.2215/CJN.07680715>
10. de Boer IH, Khunti K, Sadosky T, *et al.* Diabetes management in chronic kidney disease: a consensus report by the American Diabetes Association (ADA) and Kidney Disease: Improving Global Outcomes (KDIGO). *Diabetes Care* 2022; **45**(12):3075-90. <https://doi.org/10.2337/dci22-0027>
11. Kopple JD, Ekramzadeh M. Renal nutrition—where it has been and where it is going. *Kidney Dial* 2022;**2**(4):512-33. <https://doi.org/10.3390/kidneydial2040046>
12. Dyson PA, Twenefour D, Breen C, *et al.* Diabetes UK evidence-based nutrition guidelines for the prevention and management of diabetes. *Diabet Med* 2018;**35**(5):541-7. <https://doi.org/10.1111/dme.13603>
13. Joint British Diabetes Societies for inpatient care (JBDS-IP). Management of adults with diabetes on dialysis. March 2023. Accessed on 9th April 2025. Available online at: https://abcc.care/sites/default/files/site_uploads/JBDS_Guidelines_Current/JBDS_11_Management_of_adults_with_diabetes%20on_dialysis_with_QR_code_March_2023.pdf
14. Potassium – Fact sheet for health professionals. NIH- Office of dietary supplements. Accessed on 9th April 2025. Available online at: <https://ods.od.nih.gov/factsheets/Potassium-HealthProfessional/>
15. Weaver CM. Potassium and health. *Adv Nutr* 2013;**4**(3):368S-377S. <https://doi.org/10.3945/an.112.003533>
16. Naismith DJ, Braschi A. An investigation into the bioaccessibility of potassium in unprocessed fruits and vegetables. *Int J Food Sci Nutr* 2008;**59**(5):438-50. <https://doi.org/10.1080/09637480701690519>
17. Souto G, Donapetry C, Calviño J, Adeva MM. Metabolic acidosis-induced insulin resistance and cardiovascular risk. *Metab Syndr Relat Disord* 2011;**9**(4): 247-53. <https://doi.org/10.1089/met.2010.0108>
18. Picard K, Griffiths M, Mager DR, Richard C. Handouts for low-potassium diets disproportionately restrict fruits and vegetables. *J Ren Nutr* 2021;**31**(2):210-14. <https://doi.org/10.1053/j.jrn.2020.07.001>
19. Picard K. Potassium additives and bioavailability: are we missing something in hyperkalemia management? *J Ren Nutr* 2019;**29**(4):350-3. <https://doi.org/10.1053/j.jrn.2018.10.003>
20. van Buren L, Dötsch-Klerk M, Seewi G, Newson RS. Dietary impact of adding potassium chloride to foods as a sodium reduction technique. *Nutrients* 2016; **8**(4):235. <https://doi.org/10.3390/nu8040235>
21. Yi TW, Wong MMY, Picard K, *et al.* Managing hyperkalemia in the outpatient setting. *BCM J* 2025;**67**(3).
22. Cupisti A, Kalantar-Zadeh K. Management of natural and added dietary phosphorus burden in kidney disease. *Semin Nephrol* 2013;**33**(2): 180-90. <https://doi.org/10.1016/j.semnephrol.2012.12.018>
23. Calvo MS, Moshfegh AJ, Tucker KL. Assessing the health impact of phosphorus in the food supply: issues and considerations. *Adv Nutr* 2014; **5**(1):104-13. <https://doi.org/10.3945/an.113.004861>
24. Calvo MS & Whiting SJ. The regulatory aspects of phosphorus intake: dietary guidelines and labeling. In: Uribarri J, Calvo MS, eds. Dietary phosphorus: health, nutrition, and regulatory aspects. Boca Raton, Florida: CRC Press 2018:249-66
25. St-Jules DE, Jagannathan R, Gutekunst L, *et al.* Examining the proportion of dietary phosphorus from plants, animals, and food additives excreted in urine. *J Ren Nutr* 2017;**27**(2):78-83. <https://doi.org/10.1053/j.jrn.2016.09.003>
26. Byrne FN, Gillman BA, Kiely M, *et al.* Pilot randomized controlled trial of a standard versus a modified low-phosphorus diet in hemodialysis patients. *Kidney Int Rep* 2020;**5**(11):1945-55. <https://doi.org/10.1016/j.ekir.2020.08.008>
27. Passey C. Reducing the dietary acid load: how a more alkaline diet benefits patients with chronic kidney disease. *J Ren Nutr* 2017;**27**(3):151-60. <https://doi.org/10.1053/j.jrn.2016.11.006>
28. Noce A, Marrone G, Wilson Jones G, *et al.* Nutritional approaches for the management of metabolic acidosis in chronic kidney disease. *Nutrients* 2021; **13**(8):2534. <https://doi.org/10.3390/nu13082534>
29. Tan GD, Kozłowska O, Rea RD. Integrated care and diabetes: challenges, principles and opportunities. *Clinics in Integrated Care* 2021;**4**:100037. <https://doi.org/10.1016/j.intcar.2021.100037>
30. British Dietetic Association (BDA). BDA Professional Development Framework. Accessed on 23rd April 2025. Available online at: <https://www.bda.uk.com/practice-and-education/career-and-workforce/professional-development-framework.html>
31. British Dietetic Association (BDA). Education and Development. Accessed on 23rd April 2025. Available online at: <https://www.bda.uk.com/specialist-groups-and-branches/kidney-dietitian-specialist-group/projects/education-and-development.html>

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