



## Nutrition & Diet In Patients Receiving Dialysis

* STAGE 1	STAGE 2	STAGE 3	STAGE 4	STAGE 5
Normal function	Mild loss of function	Moderate loss of function	Severe loss of function	Kidney failure
Estimated Glomerular Filtration Rate (eGFR)				
≥ 90	60-89	30-59	15-29	< 15

### Chronic Kidney Disease (CKD) Stages

CKD stages 1-5 describe kidney disease progression, with **CKD stage 5** indicating kidney failure and the inability to remove waste products.<sup>1,3,8</sup>

### Renal Replacement Therapy (RRT)

Renal replacement therapy (RRT) options include **dialysis and kidney transplantation**.<sup>1,3,8</sup>

Hemodialysis (HD) and peritoneal dialysis (PD) are two common RRT modalities.<sup>1,4</sup>

#### Hemodialysis (HD)



**LOCATION:**  
Dialysis center or home

**METHOD:**  
Requires a machine to filter and remove waste in the blood, usually three times per week.<sup>1,4</sup>

**NUTRITION:** Several dietary restrictions.<sup>1</sup>

#### Peritoneal Dialysis (PD)



**LOCATION:**  
Usually home

**METHOD:**  
Utilizes the peritoneal membrane as a filter to remove waste from the blood.<sup>1,4</sup>

**NUTRITION:** Fewer dietary restrictions compared to hemodialysis.<sup>1</sup>



#### Caloric Intake



- Encourage adequate nutrition intake.<sup>3</sup>
- Many factors influence energy expenditure, including age, sex, level of physical activity, body composition, weight status goals, and concurrent illness or presence of inflammation.<sup>3</sup>
- Recommended daily caloric intake for adults to maintain nutritional status is 30-35 Calories/kg of body weight.<sup>3,4</sup>
- PD patients absorb calories from glucose in the dialysate fluid.<sup>1,4</sup>



#### Protein



- A daily protein intake of 1.0-1.2 g/kg of body weight is recommended.<sup>3</sup>
- This compares to 0.6 to 0.8 g/kg per day for healthy individuals and makes up for lost amino acids during dialysis and kidney failure catabolism.<sup>3,4</sup>
- Studies suggest that eating more plant-based foods improves survival for both HD and PD patients.<sup>5,6</sup>



#### Fat



- Choose heart-healthy fats such as monounsaturated fats, polyunsaturated fats, and omega-3 fatty acids.<sup>3,7</sup>
  - Examples include nuts, seeds, plant oils (i.e. olive oil), and avocados.<sup>7</sup>
- Limit trans-fats in foods like beef, lamb, and dairy.<sup>7</sup>
- Limit saturated fats in foods like cheese, beef, coconut oil, and butter.<sup>7</sup>



#### Fluid



- Patients on dialysis should receive individualized fluid intake recommendations.<sup>4</sup>
- Fluid intake includes liquid foods such as soup, popsicles, gelatin, gravy, and ice.<sup>5,8</sup>

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1. National Kidney Foundation. Choosing Dialysis: Which Type is Right for Me? <https://www.kidney.org/atoz/content/choosing-dialysis-which-type-right-me>. Accessed January 25, 2024.
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  9. Xu, et al. *British Journal of Nutrition*. 2019;122:996-1005.
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  12. Lab Values, Normal Adult. *Medscape*. [https://medicine.medscape.com/article/12172316-overview?%id=login\\_success\\_email\\_match\\_fpf](https://medicine.medscape.com/article/12172316-overview?%id=login_success_email_match_fpf). Accessed February 2024.
  13. National Kidney Foundation. <https://www.kidney.org/atoz/content/foodlabel>. Accessed February 20, 2024.
- \*Image Source: Kidney Disease Concept. (n.d.). Pikovit [Vector]. Adobe Stock. <https://stock.adobe.com/images/kidney-disease-concept/431394169>

The information provided through NephU is intended for the educational benefit of health care professionals and others who support care for those with kidney disease and other related conditions. It is not intended as, nor is it a substitute for, medical care, advice, or professional diagnosis. Health care professionals should use their independent judgement when reviewing NephU's educational resources. Users seeking medical advice should consult with a health care professional.

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## Sodium



- Volume overload is common in patients receiving dialysis.<sup>3</sup>
- Limiting sodium intake to 2.3 g/day improves blood pressure and volume status.<sup>3</sup>
  - Limit high sodium foods such as table salt, soy sauce and salty seasonings, frozen dinners, canned soups, and salted snack foods like french fries and chips.<sup>8</sup>



## Potassium



- Hypokalemia (low potassium) is more common in PD.<sup>5,6</sup>
- Hyperkalemia (high potassium) is more common in HD.<sup>5,6</sup>
- Adjust potassium intake with an individualized dietary plan to maintain normal levels (3.5-5 mEq/L).<sup>12</sup>
- High potassium foods include dried fruit, tomato sauce, molasses, potatoes, and dried beans.<sup>8</sup>
- Limit potassium-salt substitutes.<sup>8</sup>



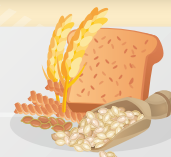
## Acid/Base Balance



- Maintain serum bicarbonate levels of at least 22 mEq/L.<sup>12</sup>
- Plant-based diets can improve metabolic acidosis, a condition that can occur in people with CKD or on dialysis.
  - Diets high in animal protein increase acid production.
  - Plant-based protein, fruits, and vegetables decrease acid production.<sup>3</sup>



## Fiber



- Fiber is associated with improved survival in patients with CKD and patients on dialysis.<sup>9</sup>
- There are no specific fiber recommendations for patients receiving dialysis.
- Fiber-rich foods include fruits, vegetables, seeds, whole grains, and legumes.<sup>11</sup>

### General Daily Fiber Recommendations (grams/day)<sup>10</sup>

	Age ≤ 50	Age > 50
Female	25 grams	21 grams
Male	38 grams	30 grams



## Phosphorus



- Dialysis cannot remove excess phosphorus from the blood, therefore managing dietary phosphorus intake is important.<sup>8</sup>
- The normal range for phosphorus is 2.7-4.6 mg/dL.<sup>12</sup>
- Phosphorus can be found in many foods such as milk, cheese, beef, pork, nuts, and lentils.<sup>8</sup>
- Plant-based phosphorus is generally less absorbable than animal-based phosphorus.<sup>8</sup>
- Limit foods with phosphate additives and look for “phos” or “phosphate” such as phosphoric acid or bisodium phosphate.<sup>3,8,13</sup>
  - Many ready-to-eat foods and beverages such as dark cola sodas or iced teas contain synthetic, 100% absorbable phosphate additives.<sup>3,8</sup>



## Calcium



- Adjust intake to avoid hypercalcemia (calcium overload).<sup>3,4</sup>
- The goal range for calcium is between 8.4 to 10.2 mg/dL.<sup>3,12</sup>
- Calcium-rich foods include dairy, sardines or salmon canned with bones, calcium fortified non-dairy milks, legumes, and green leafy vegetables.<sup>11</sup>
- Patients may need to limit “calcium-enriched” or “calcium-fortified” foods.<sup>4,8</sup>



Scan the code to discover NephU's resource platform on nutrition and diet for patients with acute and chronic kidney diseases.

**References**  
 1. National Kidney Foundation. Choosing Dialysis: Which Type is Right for Me? <https://www.kidney.org/atoz/content/choosing-dialysis-which-type-right-me>. Accessed January 25, 2024.  
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 12. Lab Values, Normal Adult. Medscape. [https://emedicine.medscape.com/article/7172316-overview?&id=login\\_success\\_email\\_match\\_fpf](https://emedicine.medscape.com/article/7172316-overview?&id=login_success_email_match_fpf). Accessed February 20, 2024.  
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