

MY KIDNEY JOURNEY



ALL ABOUT CKD

Understand the basics of CKD and its risk factors on page 2.



RENAL DIET TIPS FROM NUTRITIONISTS

Learn what you can eat with diet tips from local experts on page 10.



UNDERSTANDING AND SELECTING THE APPROPRIATE TREATMENT OPTION

Learn about your treatment options on page 5.



LIVE WELL WITH CKD

Treatment alone is not enough. Learn how to manage your condition on page 7.



RECIPE FOR TASTY AND HEALTHY DISH

Kidney-friendly recipe which is easy to prepare at home. Learn more on page 9.





ALL ABOUT CKD



Kidneys are small filters in your body, which remove wastes, toxins, and excess fluid. They play a key role in regulating blood chemicals and maintaining good health.¹



Chronic kidney disease (CKD) occurs when your kidney is damaged and has a lower filtering capacity compared to a healthy kidney. This causes excess fluid and wastes to remain in the body and leads to other health conditions.¹



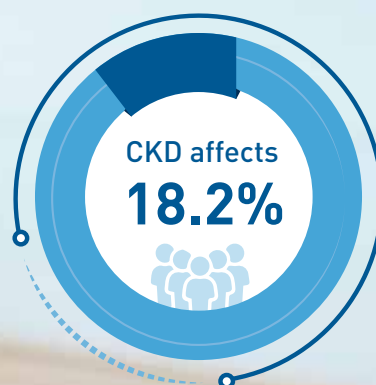
Early CKD is not associated with any signs or symptoms.¹ However, as the disease progresses, you may have one or more of the following symptoms:^{2,3}



- Swelling in the legs, feet, or ankles, and sometimes on the hands or face
- Increased or decreased urination
- Chest pain
- Shortness of breath
- Sleep disturbances
- Flank pain
- Poor concentration
- Loss of appetite
- Nausea and vomiting
- Unpleasant taste in the mouth
- Weight loss
- Dry skin, itching, or numbness
- Feeling tired
- Headaches
- Muscle cramps



In Brunei,



of the population.⁴



Risk factors for CKD



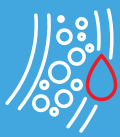
Diabetes mellitus

It is the leading cause of kidney failure in Brunei. Nearly **60%** cases of kidney failure occur as a complication of diabetes.⁵



Hypertension

Hypertension causes kidney failure in about **13%** of patients.⁶



Cardiovascular diseases (CVD)

50% of all patients with advanced CKD have CVD.⁷

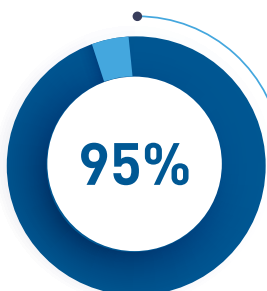
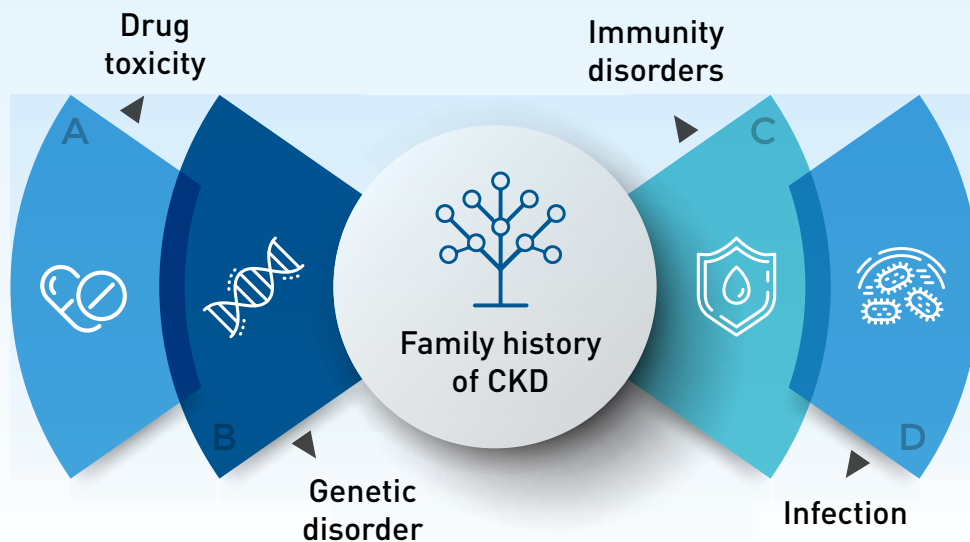


Obesity

The risk of suffering a kidney failure is **3 times** higher with obesity. Brunei has the highest prevalence of childhood obesity in Southeast Asia.^{6,8}



Other risk factors include:^{1,2}



of patients with CKD have two or more chronic conditions:⁹



Hypertension



Bone problems



High cholesterol



Heart problems





How is CKD diagnosed?

Early diagnosis is important as CKD can affect your health and can increase your risk for other diseases. Early diagnosis will help you get early treatment to protect your kidney. To check for the presence of kidney disease, the following tests can be done:¹⁰

Blood test¹⁰

Glomerular filtration rate measures how well your kidneys are filtering waste from your blood.

Creatinine is a waste product filtered by kidneys, and its level helps estimate the GFR.



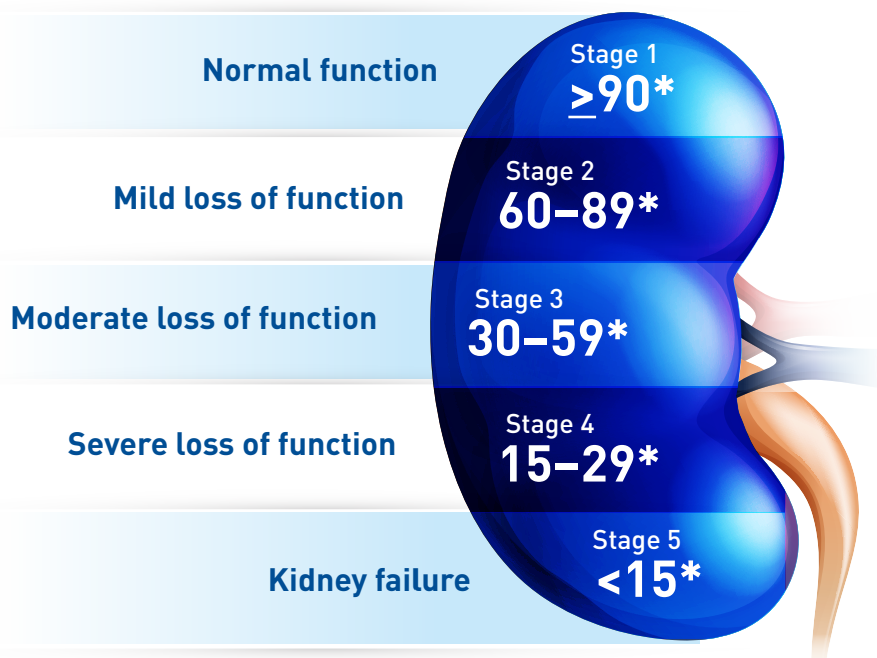
Urine test¹¹

Albumin is a protein present in the blood. Damaged kidneys allow more albumin to enter the urine.

The urine albumin-to-creatinine ratio compares the amount of albumin with that of creatinine and is used to diagnose and monitor kidney disease. It helps understand which treatment is best for you.



Once CKD is diagnosed, the next step is to identify the stage of CKD. The stage depends on how well your kidneys are currently able to filter your blood. CKD stages can be determined as:^{2,10,11}



YOUR KIDNEY HEALTH IS MEASURED BY A NUMBER. WHAT'S YOUR SCORE?

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Other tests include ultrasound, MRI scan, CT scan, and kidney biopsy.¹¹

*GFR measured in mL/min/1.73 m².

CKD: Chronic kidney disease; CT: Computerized tomography; GFR: Glomerular filtration rate; MRI: Magnetic resonance imaging.

References: 1. Chronic kidney disease basics. Available at: <https://www.cdc.gov/kidneydisease/basics.html>. Accessed on: 13 June 2022. 2. Chen TK, Knicely DH, Grams ME. Chronic kidney disease diagnosis and management. *JAMA*. 2019;322(13):1294–1304. 3. What is chronic kidney disease? Available at: <https://www.niddk.nih.gov/health-information/kidney-disease/chronic-kidney-disease-ckd/what-is-chronic-kidney-disease#howCommon>. Accessed on: 13 June 2022. 4. Liyanage T, Toyama T, Hockham C, et al. Prevalence of chronic kidney disease in Asia: A systematic review and analysis. *BMJ Global Health*. 2022;7:e007525. 5. Lim CY, Khalil M, Tan J. Impact of chronic kidney disease on healthcare in Brunei Darussalam. *Brunei Int Med J*. 2019;15:30. 6. Lim CY, Tan J. Global dialysis perspective: Brunei Darussalam. *Kidney360*. 2021;2(6):1027–1030. 7. Jankowski J, Floege J, Fliser D, et al. Cardiovascular disease in chronic kidney disease: Pathophysiological insights and therapeutic options. *Circulation*. 2021;143(11):1157–1172. 8. Kotsis V, Martinez F, Trakatelli C, et al. Impact of obesity in kidney diseases. *Nutrients*. 2021;13(12):4482. 9. Gurgel do Amaral MS, Reijneveld SA, Meems LMG, et al. Multimorbidity prevalence and patterns and their associations with health literacy among chronic kidney disease patients. *J Nephrol*. 2022;35(6):1709–1719. 10. Chronic kidney disease tests & diagnosis. Available at: <https://www.niddk.nih.gov/health-information/kidney-disease/chronic-kidney-disease-ckd/tests-diagnosis>. Accessed on: 15 June 2022. 11. Diagnosis. Available at: <https://www.nhs.uk/conditions/kidney-disease/diagnosis/>. Accessed on: 15 June 2022.



UNDERSTANDING AND SELECTING THE APPROPRIATE TREATMENT OPTION



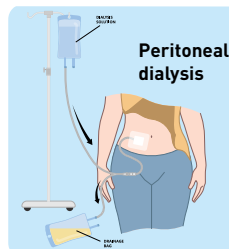
When a person reaches CKD stage 4 or 5, you may need to choose renal replacement therapy (RRT). A shared decision with your attending physician may lead to any of the following treatments:^{1,2}



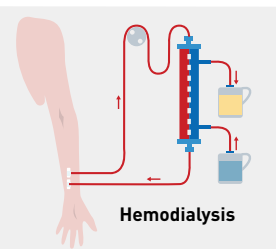
Dialysis



Kidney transplant



Peritoneal dialysis

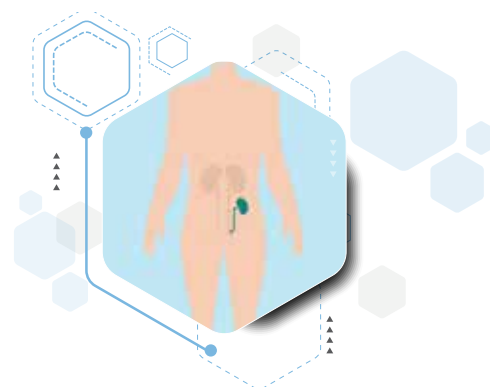


Hemodialysis

RRT is a treatment, not a cure for kidney failure.² Hemodialysis (HD) and peritoneal dialysis (PD) are two RRT options for filtering extra water and waste from the body. Discuss with your doctor to choose a RRT that suits your needs and lifestyle.^{3,4}

Kidney transplant⁵

Kidney transplant involves replacing one of your kidneys with a healthy functioning kidney. Therefore, this transplanted kidney has a better waste-filtering ability than dialysis. For a kidney transplant to succeed, the healthy kidney must come from a donor whose blood and tissue types are compatible with you and this search for a suitable donor may lead to a long waiting time.



Hemodialysis³

During HD, the dialysis machine removes blood from your body, filters it through a dialyzer or artificial kidney, and returns the cleaned blood to your body. It is performed through a vascular access, which is placed through a minor surgery. This access to your blood can be via:

- Fistula, usually created by joining artery to the vein in your arm
- Graft, a piece of soft tube placed on your arm that joins the artery and the vein
- Catheter, a soft tube placed in a large vein of your neck, chest, or groin as a temporary access



To learn more on hemodialysis,
SCAN HERE

Depending on your blood pressure, the dialysis machine will control how much fluid is removed and how quickly blood flows through dialyzer



Advantages

Controls blood pressure and balances blood minerals, such as calcium, potassium, and sodium



Disadvantages

Risk of infection, muscle cramps, sudden drop in blood pressure, and development of blood clots or scars, which can create problems with the blood flow in the dialysis machine



Peritoneal dialysis

During PD, waste and extra fluid are filtered through the blood vessels that line the walls of your abdomen called the 'peritoneum'. A fluid called 'dialysate' is filled into your abdomen through a catheter. Once it has reached into the abdomen, it is retained there to clean your blood by absorbing any waste and excess fluid. The process of filling and draining the fluid is called an 'exchange', and the length of time the dialysis solution stays in your body is called the 'dwell time'.⁴

There are two types of peritoneal dialysis:⁶

- Continuous ambulatory peritoneal dialysis (CAPD)
- Automated peritoneal dialysis (APD)

How does PD allow for more independence?



At home



While traveling



At work



Dwell time

4–6 hours; longer at night



Exchanges

3–4 times per day

Continuous Ambulatory Peritoneal Dialysis (CAPD)^{4,6}

It uses gravity, rather than a machine, to 'exchange' your old dialysis solution for fresh solution. Each exchange takes about 20 minutes, and thereafter, you can continue your usual daily routine. You can also perform treatment anywhere other than home, such as a workplace or at relative's home.

Automated Peritoneal Dialysis (APD)⁶

It is done using a machine called a 'cycler' to perform dialysis exchanges overnight during sleep, giving you the freedom to resume your normal routine during the day. When necessary, you may need to do extra daytime dialysis exchanges.



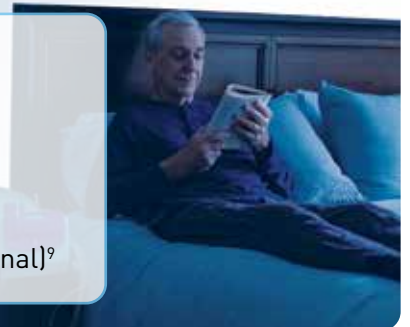
Dwell time

Typically, 45 minutes–2 hours^{7,8}



Exchanges

4–5 times at night;
1 during the day (optional)⁹



To learn more on peritoneal dialysis,
SCAN HERE



Advantages

Allows for patient independence, better time management, less hospital visit, and food restriction; preserves remaining kidney function; is a cost-effective option; and has better outcomes after transplant^{6,10,11}



Disadvantages

Risk of infection, bloating, hernia, and weight gain⁶

It is important to choose the type of dialysis that best suits your health and lifestyle needs, making it as easy as possible for you to stay on your treatment plan.

PD: Peritoneal dialysis.

References: 1. Deodhar J, Nagaraju SP, Kirpalani AL, et al. Shared decision-making, advance care planning for chronic kidney disease patients. *Indian J Palliat Care*. 2021;27(1):S33–S36. 2. What if my kidneys fail? Available at: <https://www.niddk.nih.gov/health-information/kidney-disease/chronic-kidney-disease-ckd/what-if-my-kidneys-fail>. Accessed on: 16 June 2022. 3. Hemodialysis. Available at: <https://www.niddk.nih.gov/health-information/kidney-disease/kidney-failure/hemodialysis#problems>. Accessed on: 16 June 2022. 4. Dialysis - peritoneal. Available at: <https://medlineplus.gov/ency/article/007434.htm>. Accessed on: 16 June 2022. 5. Kidney transplant. Available at: <https://www.niddk.nih.gov/health-information/kidney-disease/kidney-failure/kidney-transplant>. Accessed on: 16 June 2022. 6. Peritoneal Dialysis. Available at: <https://www.niddk.nih.gov/health-information/kidney-disease/kidney-failure/peritoneal-dialysis>. Accessed on: 16 June 2022. 7. Cullis B, Al-Hwiesh A, Kilonzo K, et al. ISPD guidelines for peritoneal dialysis in acute kidney injury: 2020 update [adults]. *Perit Dial Int*. 2021;41(1):15–31. 8. DeVita MV, Gaiki M, Gilles E. Peritoneal Dialysis Prescription and Modalities. Available at: <http://ispd.org/NAC/wp-content/uploads/2010/11/Modalities-PD-Devita-May-2011-Notes.pdf>. Accessed on: 23 August 2022. 9. Ibels L, Garchow S, Moran J. Provision of optimal dialysis for peritoneal dialysis patients. *Nephrology*. 1998;4:1–79. 10. Teakell JM, Piroaino BM. Transferring from peritoneal dialysis to hemodialysis: Proceed with caution. *Kidney Int Rep*. 2022;7(5):942–944. 11. Pros and cons - Dialysis. Available at: <https://www.nhs.uk/conditions/dialysis/pros-cons/>. Accessed on: 21 July 2022.



LIVE WELL WITH CKD

The symptoms and management of CKD can disrupt and impact the daily routine of a person. Dialysis can be life-saving but can alter one's life too. These changes are not limited to the patient; CKD and dialysis can also affect the routines of the other family members.¹ You can still cope with these challenges by preparing yourself for your dialysis treatment.



Emotional care



Receiving a diagnosis of CKD can bring in a flood of emotions, such as denial, anger, hopelessness, fatigue, and fear. Some individuals may also have lack of sleep, guilt, panic attacks, and loss of sex drive.^{2,3} Emotional well-being is important as it can affect your attitude toward the diagnosis and its outcomes.^{1,3}



Here are a few tips on how to look after yourself emotionally:²⁻⁴



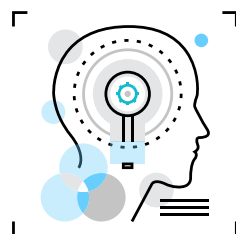
Do not be hard on yourself

It is okay to feel a certain way and to have a slow start. Remember that you can always seek help while you deal with this.



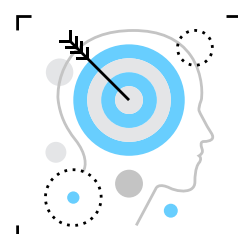
Express

You can discuss issues with your family, partner, friends, doctors, or other patients.



Learn

Although all the new information can be overwhelming, try to calm down and compile your queries. You can ask any question to your doctor and the dialysis team. Try to collect as much information as you can for understanding your requirements.



Try to maintain your routine

Continue your hobbies and interests, and stay connected with your loved ones. Stay active, and actively participate in your treatment plan.



Family support



Family plays the most important role when it comes to dealing with problems, especially health issues. Families can provide emotional and physical support to help patients deal with anxiety and stress. There are multiple ways one can support a patient; some of them include:³

- Family members can help the patients during the therapy process.
- They can provide support so that patients do not feel alone.
- They can provide affection, listen to the patient's complaints, and provide encouragement and motivation.
- They can help the patient to get back to normal and active life by encouraging self-management.



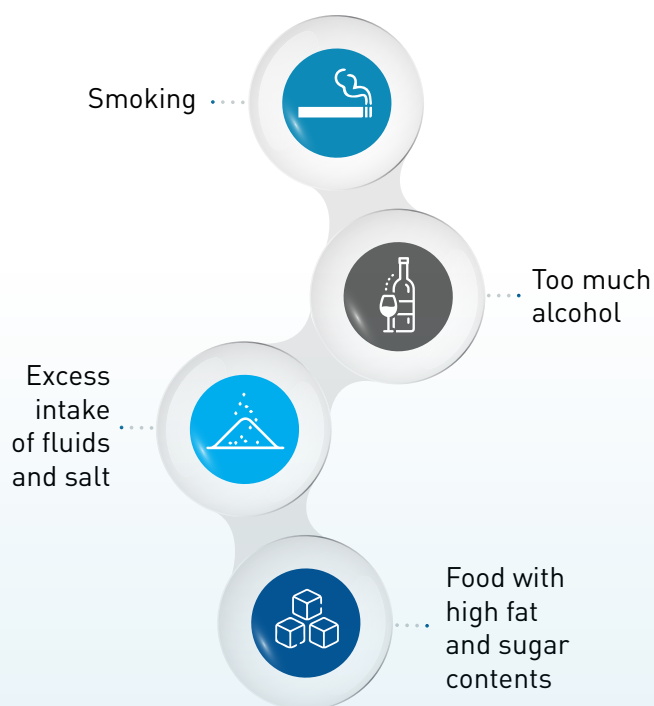
A few kidney-friendly tips⁵



Adopt these tips for healthy kidneys:



Avoid these to maintain healthy kidneys:





RECIPE FOR TASTY AND HEALTHY DISH

Are your taste buds craving for your favorite food, but the kidneys are holding you back? Not anymore! We bring back to you your favorite recipes, which are easy to cook and delicious to eat.



Santan-free chicken rendang



INGREDIENTS

- 220 g boneless chicken breast (raw): Cut half of it into bite-size pieces
- Turmeric and kaffir lime leaves

Blend the following spices until fine:

- 1 cup shallots
- 4 cloves of garlic
- 1 inch of ginger
- 2 sticks of lemongrass
- 1 inch of galangal
- 1 inch of ground turmeric
- 3 whole fresh red chillies
- 15 cm x 1 piece of turmeric leaves, sliced finely
- 2 tablespoons of cooking oil
- 1/2 cup of water

Servings: 4



INSTRUCTIONS

- Heat oil in pan, then saute the blended spices until fragrant. Add chicken and water into the pan, and stir over the medium heat.
- Bring to a boil, then reduce heat, and simmer until gravy thickens. Add turmeric leaves and kaffir lime leaves, continue to cook until the meat is tender, and the gravy is reduced to desired thickness.
- Serve hot.



Nutrition facts

Energy **160**
kcal

Protein **13**
g

Fat **9**
g

Total
carbohydrates **6**
g

Dietary fiber **0.9**
g

Phosphorus **142**
mg

Potassium **326**
mg

Sodium **174**
mg



RENAL DIET TIPS FROM NUTRITIONISTS

The treatment of CKD needs to be supported by a diet that favors your body's requirements. Here are a few tips that you can keep in mind while working on your diet plan.



General recommendations for CKD patients

Sodium^{1,2}

- It plays a role in regulating blood pressure, blood volume, nerve function, and muscle function.
- Intake of too much sodium can lead to the following in CKD patients:
 - ✓ Increased thirst
 - ✓ Swelling of the hands, legs, and face
 - ✓ High blood pressure
 - ✓ Heart failure



Avoid canned, packaged, frozen, and fast foods, and skip salt.⁵

Phosphorus^{4,5}

- It plays a key role in bone health and helps in maintaining kidney function, muscle contractions, normal heartbeat, and nerve signaling.
- Excess phosphorus can lead to:
 - ✓ Calcium depletion
 - ✓ Weak bones
 - ✓ Itchy skin



Limit processed and packaged foods, fish, poultry, etc.⁵

Potassium³

- It regulates heartbeat and helps your nerves and muscles work.
- If kidneys fail to remove potassium, it can lead to an excess of potassium in the body, which may result in:
 - ✓ Muscle weakness
 - ✓ An irregular heartbeat
 - ✓ Slow pulse
 - ✓ Heart attacks
 - ✓ Death



Limit bananas, kiwis, and dried fruits⁵

Protein⁶

- It is important to maintain tissues of the body.
- In CKD, when kidneys are unable to remove excess waste, it accumulates in the body, leading to an extra burden on the kidneys.
- Appropriate consumption of proteins is tricky and depends on the CKD stage.
- Consult your nephrologist or renal dietitian for your protein intake requirements.



Control fluids...

Why?²

Too much fluid can lead to:

- Swelling or edema
- High blood pressure
- Heart problems
- Breathing problems

How?²

While calculating daily fluids, count:

- All foods that melt at room temperatures, such as gelatin, pudding, and ice cream.
- Soups and fruits

Be mindful of the amount of fluids used in cooking.



Vitamins and minerals



The dialysis treatment can wash some water-soluble vitamins out of your body; so, you may be prescribed supplements. However, avoid self-prescribing as certain vitamins and minerals are harmful to people on dialysis. Always consult your doctor before making any changes in your diet.^{2,5}



If you are an adult starting on HD...^{5,7}



Restrict fluid as it can cause high blood pressure and shortness of breath.



You may lose protein during HD, so consume high-protein foods, such as meat, fish, and eggs (Not more than 6 per week).

Avoid processed meats.



Use herbs or spices to replace salt.



Limit the intake of dairy products, and avoid 'whole grain' and 'high-fiber' foods, such as whole wheat bread, bran cereal, and brown rice, to reduce phosphorus intake.



If you are an adult starting on PD...

Watch your calories as your dialysis solution contains sugar that adds to the calories in your body.⁴



As PD can make you lose protein, eat high-quality proteins, such as lean beef, tuna, skinless chicken, and eggs.²



Too much or too little potassium can be dangerous for the heart, so monitor it closely.²



Limit your sodium intake to control thirst and weight gain, and to lower the need for high-sugar dialysis solutions.²



High-phosphorus intake may lead to calcium deficit, and your bones may become fragile. Your doctor may suggest some phosphorus binders.²



The above diet recommendations are consolidated and provided by Baxter Clinical Specialist team.



Did you know?

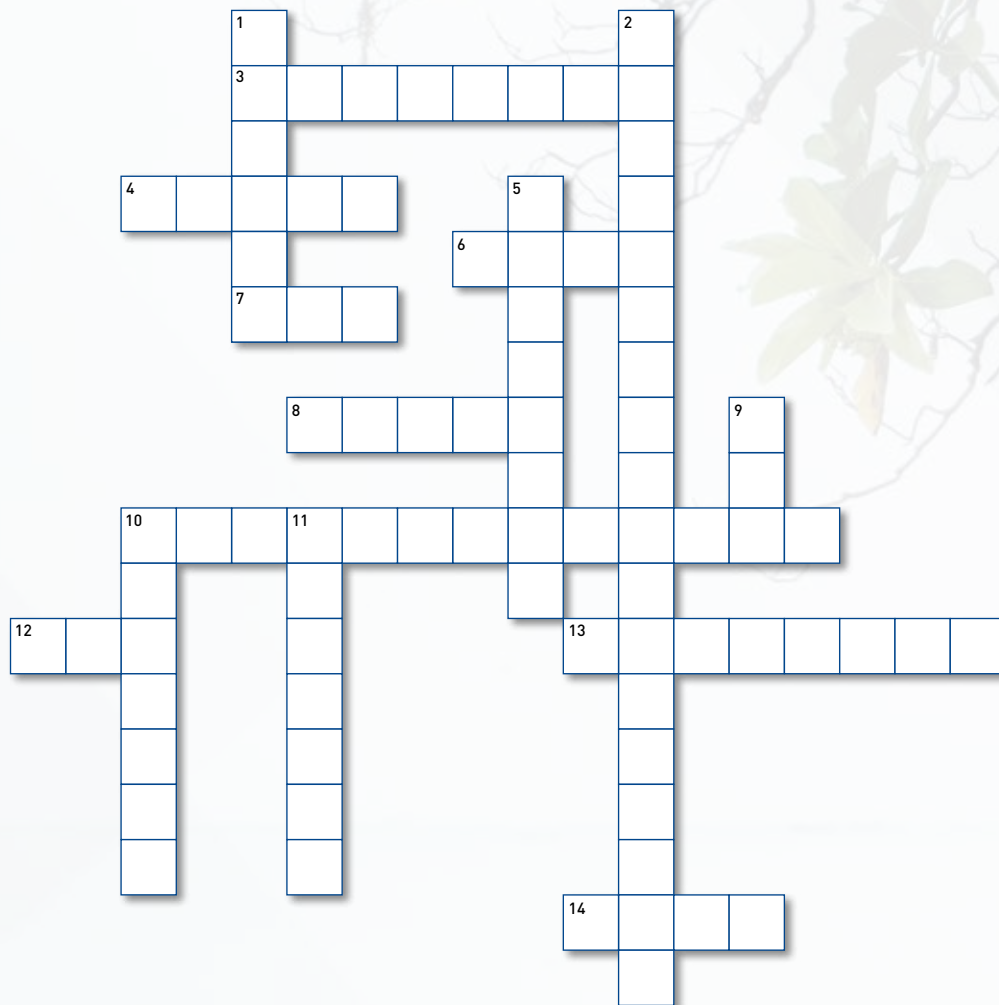
CKD is often associated with an irresistible urge to move one's legs, especially at night. This is called 'restless leg syndrome' and often affects up to **32.1%** of patients.⁸

CKD: Chronic kidney disease; HD: Hemodialysis; PD: Peritoneal dialysis.

References: 1. Sodium in diet. Available at: <https://medlineplus.gov/ency/article/002415.htm>. Accessed on: 14 July 2022. 2. Eating & Nutrition for peritoneal dialysis. Available at: <https://www.niddk.nih.gov/health-information/kidney-disease/kidney-failure/peritoneal-dialysis/eating-nutrition>. Accessed on: 6 July 2022. 3. Potassium. Available at: <https://ods.od.nih.gov/factsheets/Potassium-Consumer/>. Accessed on: 14 July 2022. 4. Phosphorus in diet. Available at: <https://medlineplus.gov/ency/article/002424.htm>. Accessed on: 14 July 2022. 5. Eating & nutrition for hemodialysis. Available at: <https://www.niddk.nih.gov/health-information/kidney-disease/kidney-failure/hemodialysis/eating-nutrition>. Accessed on: 6 July 2022. 6. Nutrition for advanced chronic kidney disease in adults. Available at: <https://www.niddk.nih.gov/health-information/kidney-disease/chronic-kidney-disease-ckd/eating-nutrition/nutrition-advanced-chronic-kidney-disease-adults>. Accessed on: 7 July 2022. 7. Tallman DA, Sahathevan S, Karupiah T, et al. Egg intake in chronic kidney disease. *Nutrients*. 2018;10(12):1945. 8. Brzuszek A, Hazara AM, Bhandari S. The prevalence and potential aetiological factors associated with restless legs syndrome in patients with chronic kidney disease: A cross-sectional study. *Int Urol Nephrol*. 2022.

KROSSWORD

Life is more fun when you play games. This quick crossword will help you understand your kidneys and get your brain cells functioning.



Across

3. Process of changing dialysis fluid
4. Limit this sweet ingredient
6. Should be limited in diet
7. Number of kidneys one person has
8. Waste product of kidneys
10. CKD stage 5 is also called
12. Long-standing disease of the kidneys leading to renal failure
13. Replaces the kidney function
14. Number of stages of CKD

Down

1. Maintain _____ to stay healthy
2. Type of dialysis using body's membrane
5. A tubing inserted in the abdomen for the peritoneal dialysis
9. Measures kidney function and determines the stage of kidney disease
10. Bean shaped and filter waste
11. Blood-filtering units

Answer key: Across: 3. exchange; 4. sugar; 6. salt; 7. two; 8. urine; 10. kidney failure; 12. CKD; 13. dialysis; 14. five. Down: 1. weight; 2. peritoneal dialysis; 5. catheter; 9. GFR; 10. kidneys; 11. nephron.

CKD: Chronic kidney disease.

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