



FOREWORD

This handbook marks the latest in a series of educational material from DaVita to assist you in understanding more about the world of kidney disease.

Chronic Kidney Disease (CKD) is a challenging journey, both for those diagnosed and for their loved ones. It is a condition that requires not only medical management but also understanding of its impact on daily life. This handbook is designed to be your companion, offering insights, strategies, and support to navigate the complexities of living with CKD.

From understanding the fundamentals of kidney function to practical tips for managing symptoms and treatments, this handbook covers a wide spectrum of topics. Whether you are newly diagnosed, a long-time patient, or a caregiver seeking guidance, you will find relevant and reliable information to empower you on your CKD journey.

As you dive into this handbook, remember that you are not alone. There is a vast community of individuals, healthcare professionals, and organisations dedicated to supporting you every step of the way. Embrace the knowledge within these pages, lean on the support networks available to you, and never underestimate the power of your own determination.

On behalf of all those involved in the creation of this handbook, I extend my heartfelt wishes for your well-being and resilience. May this resource serve as a guiding light on your journey with CKD, empowering you to live your best life despite its challenges.

Warm regards,

Dr Tan Li Ping
Chief Medical Officer
DaVita Malaysia



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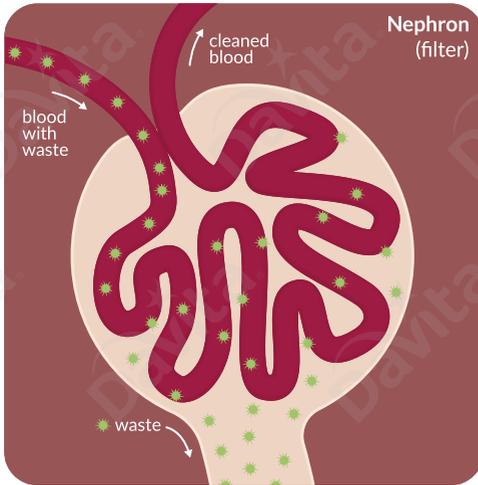
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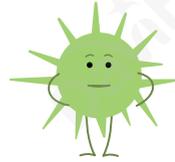
The Role of Kidneys in Your Body

Kidneys do many important jobs for the body.

Here are some of the most important.



Clean your blood



Kidneys filter out extra nutrients and other wastes that your body does not need. These "toxins" would harm your body if it weren't for the kidneys. Each kidney contains millions of tiny filters called nephrons. These filters work 24/7 making urine to rid your body of waste.

Remove extra fluid



When drinking fluid (for example water), it spreads throughout the body. When the body has met its needs, healthy kidneys urinate the extra out.

Help make red blood cells



Red blood cells deliver oxygen from the lungs to the organs. Without these cells, oxygen wouldn't make it from the lungs to the places in the body that need it.

Activate vitamin D



The body gets vitamin D from the sun and foods. Healthy kidneys take this raw vitamin D and make it useful for the body. It's needed to keep bones strong and phosphorus balanced.



Why Kidney Health Matters?

When kidneys stop working well, they can no longer remove toxins and extra fluid. These toxins and fluids can build up in your body and cause more damage to your kidneys and other organs.

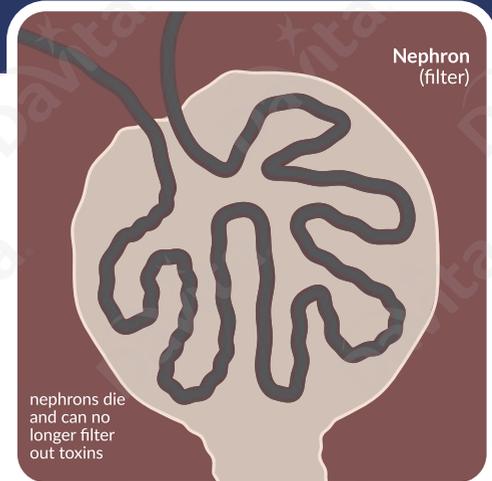
WHAT IT FEELS LIKE



When kidney function gets really bad, you could feel ill, nauseous,

itchy, and experience swelling and trouble breathing.

Many people don't have symptoms until kidney function is very low.



Kidneys are like a kitchen strainer. It separates what you need in your body from what you don't. With CKD, the kidneys are like a strainer with plugged holes, it can't filter very well and you could feel ill, nauseous, itchy, and experience swelling and trouble breathing. Many people don't have symptoms until kidney function is low.

ANOTHER WAY TO THINK ABOUT IT



Kidneys are like a kitchen strainer. It separates what you need in your body from what you don't.



With CKD, the kidneys are like a strainer with plugged holes. It can't filter very well.

What is Chronic Kidney Disease (CKD)?

Chronic Kidney Disease (CKD) is characterized by kidney damage, leading to an impaired ability to filter blood effectively. Consequently, the body retains excess fluid and waste, potentially resulting in additional health issues such as heart disease and stroke.

Patients are now encouraged to 'know their kidney number' as a part of knowing their health status. This will help further enhance the sense of involvement that they have towards their own health care.

5 Stages of CKD

CKD has 5 different stages that describe the levels of kidney function. Kidney doctors use a lab test, called GFR, to measure kidney function over time. It is often referred to as a percentage of kidney function.



Stage 1 and 2

GFR >60

Slight or mild kidney damage but still function normally.

Usually no symptoms at these early stages.

Manage stress and quit tobacco use. Work with your doctor on ways to control blood pressure.

Stage 3

GFR 30-59

Moderate loss of kidney function.

Many don't have any symptoms. But some people experience swelling, feel more tired, and have nausea.

Control high blood pressure and/or diabetes. Take medications and follow lifestyle guidance from your doctor.

Stage 4

GFR 15-29

Severe loss of kidney function.

Nausea, vomiting, itching and swelling are typical. Trouble concentrating can be a symptom too.

Pay special attention to what you eat and drink to manage blood pressure and diabetes. Educate yourself about different treatment options to replace kidney function.

Stage 5

GFR <15

Very little kidney function left.

Symptoms like swelling, itching, appetite and mood changes are common.

Work with your doctor and prepare for life-saving transplant and dialysis treatment options.



How Common is CKD in Malaysia?

Kidney disease is a major global health crisis caused mainly by diabetes and high blood pressure, with 11% of the world's population (Jager et. al., Kidney International, 2019) or 3.9 million patients requiring dialysis (Liyana et. al., Lancet, 2015). Chronic Kidney Disease (CKD) in Malaysia is becoming increasingly common among younger people.

There are currently over 50,000 people suffering from kidney disease in Malaysia (Murugesan, 2023), and over 9,000 new cases have been diagnosed every year since 2018 (Bernama, 2023). Study shows that the prevalence rate of Chronic Kidney Disease (CKD) in Malaysia has increased from 9.07% in 2011 to 15.48% in 2018.

> 50,000



**suffering from
ESKD**

> 9,000



**new kidney patients
registered annually**

Is kidney disease hereditary?



Yes, Kidney disease can run in biological families. Risk factors for CKD, like diabetes, also tend to run in families.

Is kidney disease reversible?



In many patients, CKD may not be reversible. But it may be managed so that the progression to ESRD is slowed significantly. Without proper treatment, ESRD can develop much sooner than expected, and you will need to undergo dialysis or a kidney transplant.



Main Causes of CKD

The most common causes of CKD are high blood pressure and diabetes. It is important to know the cause of the damage because treating it may help you manage CKD.

High Blood Pressure



The body's blood passes through the kidneys, allowing them to eliminate waste. When blood pressure is elevated and flows rapidly through the kidneys, the delicate filters can sustain damage. Consider watering a flower bed with a gentle watering can versus using a high-pressure fire hose. The latter would wash away all the flowers. Similarly, the kidneys face a similar situation. Prolonged high pressure begins to deteriorate these filters. Once damaged, the body does not replace these filters.

Diabetes



When maintained at appropriate levels, blood sugar (glucose) plays a beneficial role in the body. However, in individuals with diabetes, elevated blood sugar levels can become problematic and exert serious effects on the kidneys. Excessive blood sugar can batter the filters of the kidneys, leading to irreversible damage over time.



Other Risk Factors

Risk factors may not only play a role in the development of kidney disease, but may also impact its progression. Some of these risk factors are shown below:

Health Conditions:

 Past history of kidney injury	 Frequent urinary tract infections	 Metabolic syndrome	 Uric Acid
 Kidney Stones	 Kidney Cysts	 Prostate Enlargement	

Lifestyle Factors:

 Obesity	 Cigarette smoking	 Carbonated beverages	 High fructose corn syrup
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Demographic and socioeconomic factors:

 Certain ethnic groups (Asian, Hispanic, Africans)	 Low socioeconomic status	 Low birth weight
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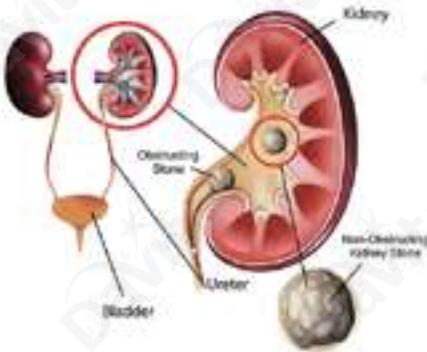
Things in our life that we can improve such as smoking, weight or choices of food can have a large impact on our kidney health. Remember, we cannot detect kidney health without regular blood and urine tests.





Kidney Stones

This is quite a common condition in Malaysia, approximately affecting 1 out of every 10 people. Stones are essentially made from crystals that form from minerals like calcium and phosphorus which are present naturally in the blood. Crystals are formed in the urine because the urine is where generally they can be found in a higher concentration. Once enough crystals are formed, they can then clump together to form a stone.



The trouble with stones is that if they get stuck in the urinary tract they can cause pain or even kidney damage. The pain from a stuck kidney stone is usually described as a severe cramp from the back radiating towards the front. Not something you would ignore. Other complications that can develop are urine and kidney infections.



Stones can be found in different places in the kidney and along the urine tract. Its usually the ones stuck in the urine tract that cause pain.

Some people may not have stones develop, but just have calcium stuck in the tissues of the kidney, This is rare and if present, may result in a higher risk of stone formation or slow loss of kidney function.

You may discover that you have stones if you notice blood present in the urine. Some patients have blood that is invisible to the naked eye, but detectable on the urine test.



A kidney stone



A common stone ingredient: Calcium Oxalate crystals under a microscope

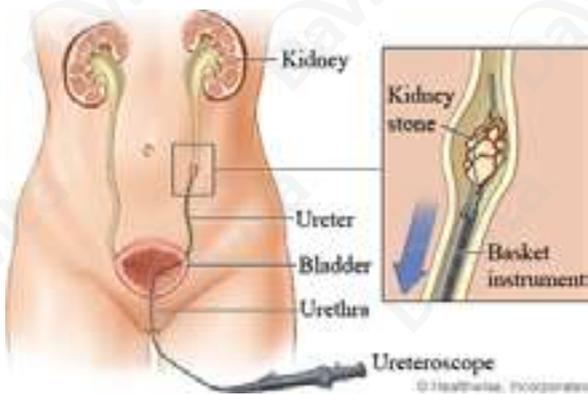


Causes and Risk Factors

If your doctor suspects stones, he will then order an image of the kidney and urine collecting system. This can be either one or more of the following:

- Kidney-Ureter-Bladder X-Ray
- Kidney-Ureter-Bladder Ultrasound (you will need a full bladder for this)
- Kidney CT Urogram (this can usually be done without the need of contrast dye)

If the stones are deemed to be large, you will need to see a kidney surgeon (Urologist) to discuss options to remove them.



Laser Lithotripsy Procedure done to treat kidney stones

It's a good idea to prevent stones from happening in the first place. Try to do the following:

- Drink enough plain water (if you have stones, the general advice is to drink more than 2 litres of water a day)
- Avoid carbonated drinks
- Don't take too much salt (salt increases calcium in the urine and can promote crystal formation)
- Maintain a healthy weight
- Protein heavy diets can increase the risk of stone formation
- Some people, depending on the kind of stone they have, may benefit from using medications to change the pH (acidity) of the urine. Consult your doctor for advice.



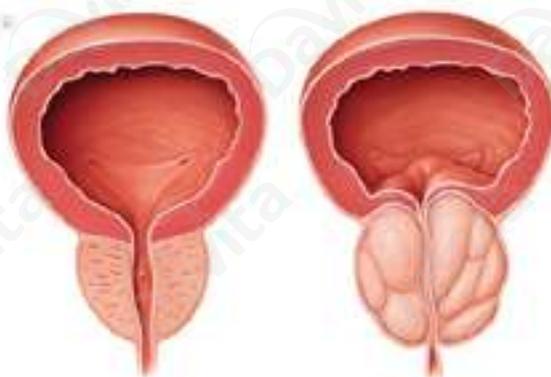
Prostate Enlargement

The prostate is a gland unique to males. A number of things can happen to the prostate gland that may impact the kidney. The most common of which is the enlargement that can occur with age. In some cases, the prostate can grow large enough that it blocks the outflow of urine from the bladder. If this happens, the pressure from the blocked urine tract can lead to kidney damage. Fortunately, this is not that common.

More commonly, enlargement of the prostate can result in urine symptoms like a reduced urinary flow, a feeling like the bladder is not completely empty after urination. A sense of urgency that develops soon after the bladder has been empty and sometimes, waking up multiple times at night to urinate.

If you experience these symptoms, make sure to ask your doctor for advice. Your doctor may recommend a simple ultrasound scan which can reveal the size of the prostate. Sometimes, additional testing may be advised, which can include a blood investigation called the Prostate Specific Antigen (PSA) test.

Most patients with enlarged prostate can be successfully managed with a combination of some simple lifestyle changes and medications.



Normal Prostate

Enlarged Prostate



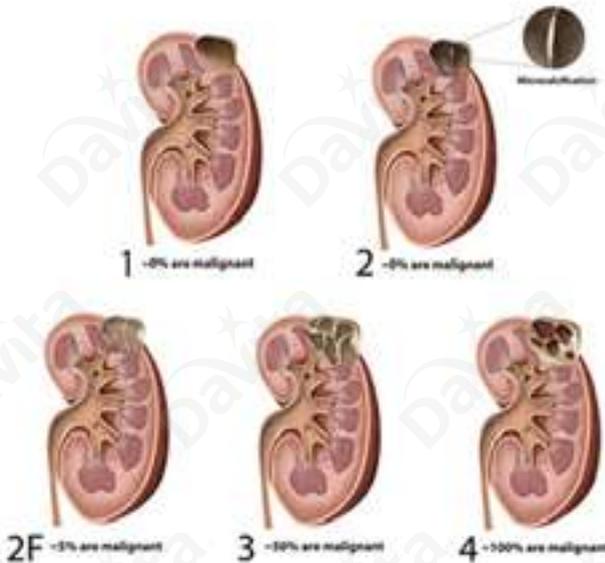
Cysts in the Kidney

Cysts are 'bubbles' in the kidney that are filled with fluid. They are fairly common and are usually found by accident, typically when a kidney ultrasound is being done perhaps for health screening or for some other reason. They can range from small (< 1cm) to large (>5cm), and can be single or multiple in number. They can also be found in one kidney or in both kidneys

Generally, cysts are nothing to be concerned about. It's not completely clear how they form, but when they do occur, the important distinction is whether they are benign or malignant.

Radiologists (x-ray doctors) have a way to describe how likely a cyst is to become malignant. On an ultrasound, they will describe how the cyst looks like. This description is then given a 'rating', known as a Bosniak classification. This classification will help your doctor decide how to treat the cyst.

Bosniak classification of renal cysts





Can cysts result in kidney failure?

In rare instances, cysts can be present in large numbers in both kidneys. These cysts can grow and push aside normal healthy kidney tissue, ultimately resulting in damage to the kidney. Sometimes, this damage worsens and can ultimately lead to kidney failure.



Recognising the warning sign

As kidney function gets lower (e.g. Stage 4 or 5), you may start noticing some changes in your body. These include:



Itchy skin



Foamy urine



Swelling in legs
and feet



Puffy eyes



Feeling sick
and tired



Poor appetite



Too much urine or
not enough



Trouble breathing



Not everyone experiences symptoms the same way. If you feel any of these, talk to your doctor straight away.

Yearly wellness checks with your doctor are a good way to find out whether you have problems with blood pressure or blood sugar. Remember, both of these conditions can negatively impact your kidneys.

For some patients, doctors will advise for more frequent health checks for better monitoring.





Get Yourself Checked!

How frequently you need to follow up and do a blood test to monitor your kidney function depends on the severity of your kidney health. The worse your kidney health is, the more frequently you should check in with your doctor.

Your doctor may ask you to do more frequent monitoring if they are worried about the likelihood that you may be at higher risk of developing other conditions related to your kidney health.

A suggested guideline for the follow up of a CKD patient is presented below:

Stage	Description	eGFR (ml/min/1.73m ²)	Follow up
1	Kidney damage with normal or increased GFR	≥90	Not more than routine
2	Kidney damage with mildly decreased GFR	60-89	12 months
3a	Moderately decreased GFR	45-59	6-12 months**
3b	Moderately decreased GFR	30-44	6 months**
4	Severely decreased GFR	15-29	3-6 month**
5	End Stage Kidney Disease	<15	Monthly**

Note: Patients with newly diagnosed kidney disease OR patients with rapidly worsening renal impairment should be seen more frequently. Patients with poor blood pressure or diabetes control should also be seen more frequently.

** Patients can be seen more frequently as determined by a Nephrologist

You should see a nephrologist for a medical opinion if the following apply:

- Presence of protein in the urine (proteinuria) that exceed > 1g/day
- Presence of blood in the urine analysis that is persistent upon repeated testing
- GFR < 60ml/min/1.73m²



A suggested interval for laboratory testing is as follows:

Each visit, generally the doctor will want to get a blood test for the following indicators:

1. Creatinine
2. Urea
3. Electrolytes (Sodium / Potassium)

The doctor may also check blood for:

1. Haemoglobin
2. Bicarbonate

Usually, the doctor will also want to get urine for the one or more of the following:

1. Urine Analysis
2. Urine Microalbumin
3. Urine Albumin-Creatinine Ratio
4. Urine Protein-Creatinine Ratio

Very rarely, your doctor may want to do a 24-hour collection of urine to analyse its contents.



How does CKD get diagnosed?

1



Consult Your Healthcare Provider

- Medical History
- Physical Examination
- Symptoms Evaluation

2



Blood Test

- Glomerular Filtration Rate (GFR)
- Creatinine Level

3



Urine Test

- Albumin
- Blood in the Urine

+



Imaging Test & Biopsy

- Ultrasound Test
- Magnetic Resonance Imaging (MRI)
- Computerised Tomography (CT)
- Kidney Biopsy

Blood Chemistry	What does it mean?	Range
Glomerular Filtration Rate (GFR)	Measures how well your kidneys are filtering waste. Determines stage of kidney disease.	Stage 1: >90 Stage 2: 60–89 Stage 3: 30–59 Stage 4: 15–29 Stage 5: <15
Creatinine	Waste product from muscles. Level increases as kidney function decreases.	44-110 µmol/L
Albumin	Measures nutrition and protein. Ask your doctor or dietitian about how much protein is right for you.	35-50g/dL



Estimating Renal Function using eGFR Equations

Estimation of renal function is currently best done via the usage of creatinine based eGFR equations. Because normal GFR approximates 100ml/min/1.73m², eGFR can be easily translated to patients and caretakers as percentage of normal, which is more understandable than creatinine.

To find out your GFR level, you can visit the GFR Calculator on the DaVita website at DaVita.com.my.

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GFR Calculator

Understanding your GFR can help you know how your kidney is doing and how the progression of your condition.

Serum Creatinine: [Normal 0.6 - 1.2] | Age: [Select One] | Gender?: [Select One] | CHECK RESULT



MedCalc, available on both Android and iPhone operating systems, serves as an example of a free eGFR Calculator in the form of smartphone application. Similarly, you can also access a website version of the eGFR Calculator via: <http://mdrd.com/>.



Delaying CKD

While there is currently no specific cure for Chronic Kidney Disease (CKD), there are measures that can be taken to preserve kidney function and extend their optimal performance to promote the longevity of kidney function.

Lifestyle Intervention

Control your blood pressure

Untreated high blood pressure can lead to narrowed blood vessels, coronary heart disease, heart and kidney failure.



Healthy range:

>140/90 All patients

>130/80 Patients with diabetes and high proteinuria



Take blood pressure medicine (upon prescription)



Quit drinking alcohol and smoking

Monitor your blood glucose

Uncontrolled diabetes can lead to increased loss of kidney function, coronary heart disease, vision loss and other complications.



Limit sugar intake to:

<30g/day (1tbsp = 15g of sugar)



Adopt a diabetes and kidney friendly diet such as apple, eggplant, lean meats and unsweetened tea



Adhere to your insulin and other diabetes medications (upon prescription)



Adopt a kidney-friendly diet

Kidney friendly diet is recommended to reduce the burden on the kidneys by reducing the metabolic waste produced by the body.



Restrict intake of:



Salt: <2.4g/day

(Added to food)

Sodium Chloride: <5-6g/day

(1 tbsp = 2.4g of sodium)



Protein:

0.6-0.8-1g/kg/day

(CKD Stage 3-5)

1.0-1.3g/kg/day

(CKD Stage 5)



Energy intake:

30-35 kcal/kg/day

Saturated fats: <10%

Unsaturated fats: =20%

Cholesterol: ≤300mg/day

Carbohydrates: ≥50-65%

Simple Sugars: <10%



Include low phosphate and potassium foods

(Consider calcium supplements)



Vitamins:

Vitamin B Complex, Vitamin C,

Vitamin D (1,25-dihydroxyvitamin D)

(For Protein-restricted patients)

Vitamin D (1,25-dihydroxyvitamin D)

(Vitamin D deficient patients)

Exercise regularly

Regular exercise is crucial to promote cardiovascular health, manage weight, control blood sugar and improve your overall well-being



Maintain a healthy weight by exercising like walking for 30 minutes, 5 times a week



Use OTC medications and supplements with caution

When your kidneys are not functioning properly, some medications can accumulate in the blood damaging the kidneys further



Talk to your doctor before consuming any medications & supplements

Medical Interventions

Hypertension

Condition	Hypertension (high blood pressure)
Treatment	<p>Common Hypertension Medications</p> <ol style="list-style-type: none"> Angiotensin Receptor Blockers (ends with 'tan', e.g. Losartan, Telmisartan, Irbesartan, etc.) Angiotensin Converting Enzyme Inhibitors (ends with 'pril', e.g. Perindopril, Lisinopril, Captopril, Ramipril, etc.) Calcium channel blockers (ends with 'ine', e.g. Amlodipine, Lercanidipine, Felodipine) Beta blockers (ends with 'lol', e.g. Metoprolol, Atenolol, Bisoprolol, Carvedilol, Nebivolol) Diuretics (e.g. Hydrochlorothiazide, indapamide, frusemide, etc.)
Descriptions	<p>Angiotensin Receptor Blockers and Angiotensin Converting Enzyme Inhibitors are usually the preferred group of medications for patients with CKD. Research has shown that these 2 categories of medications have the ability to slow the deterioration of kidney function.</p> <p>Calcium channel blockers are useful cause a reduction in blood pressure by 'relaxing' the blood vessels.</p> <p>Beta blockers slow the heart rate, thereby reducing blood pressure.</p> <p>Diuretics are useful to increase the excretion of salt from the bloodstream, which leads to a lower blood pressure.</p>



Goal

Persistent high blood pressure can damage the filters of the kidney. The goal is usually to keep the average resting blood pressure below **140/90mmHg**.

If you have protein in the urine, diabetes or have CKD; keeping a lower blood pressure has been shown to be healthier. In these situations, your doctor may try to keep your resting blood pressure below **130/80mmHg**.



DO make it a habit of measuring your blood pressure at home and keeping a record.



DON'T make the mistake of assuming that if you don't experience symptoms like a headache, you don't have high blood pressure.

Diabetes

Condition

Diabetes (high blood glucose)

Treatment

Common diabetic medications

1. **Sodium-Glucose Transport Protein 2 Inhibitors** (ends with 'gliflozin', e.g. Empagliflozin, dapagliflozin, canagliflozin etc.)
2. **Glucagon-like Peptide 1 Receptor Agonists** (ends with 'glutide', e.g. Semaglutide, liraglutide etc.)
3. **Biguanide** (e.g. Metformin)
4. **Sulphonylureas** (ends with 'ide', e.g. Gliclazide, glipizide)
5. **Insulin**



Descriptions

Sodium-Glucose Transport Protein 2 Inhibitors are the latest group of medications which have shown great promise in reducing diabetes induced damage to the kidneys, heart and brain. Therefore, as much as possible, your doctor will try to see whether you are suitable for them.

Glucagon-like Peptide 1 Receptor Agonists are another new category of diabetic medications that not only are powerful glucose reducing agents, but also have additional benefits like heart and brain protection. These medications are also good for weight loss.

Metformin is often the first medication that diabetics are started on. However, it's important to note that its effectiveness is reduced as kidney function declines.

Sulphonylureas and **insulins** are powerful medications. Both may require lowering of doses in CKD.

Goal

To prevent the damage glucose has on the kidneys, keep overall glucose levels as normal as possible.

Test your HbA1c levels every three months, the aim should be <7% if possible.



Expert Tip:

Kidney doctors often look for protein in the urine in diabetic patients as a sign that diabetes is the cause for the kidney damage.



Proteinuria

Condition	Proteinuria (protein in the urine)
Treatment	<p>Common medications used for reducing protein in the urine are:</p> <ol style="list-style-type: none">1. Angiotensin Receptor Blockers (ends with 'tan', e.g. Losartan, Telmisartan, Irbesartan etc.)2. Angiotensin Converting Enzyme Inhibitors (ends with 'pril', e.g. Perindopril, Lisinopril, Captopril, Ramipril etc.)3. Sodium-Glucose Transport Protein 2 Inhibitors (ends with 'gliflozin', e.g. Empagliflozin, dapagliflozin, canagliflozin etc.)4. Mineralocorticoid Receptor Antagonists (ends with 'tone', e.g. Spironolactone, eplerenone, finerenone)
Descriptions	<p>Mineralocorticoid Receptor Antagonists are a strong medication capable of reducing protein in the urine. They are sometimes also used for to reduce blood pressure in patients with difficult to control hypertension and in patients with heart failure.</p> <p>Patients who are on these medications will have to be careful of potassium containing foods as the medications result in a higher risk of hyperkalemia.</p>
Goal	<p>One of the key objectives of kidney care is to reduce the amount of protein in the urine as much as possible. The reduction of protein is linked to a slower decline in kidney function.</p> <p>The goal is to get urine protein to at least <1gram/day.</p> <p>Ways to check the urine protein are the following</p> <ol style="list-style-type: none">1. Urine analysis2. Urine microalbumin3. Urine albumin-creatinine ratio4. Urine protein-creatinine ratio5. 24-hour urine collection for protein quantification



Anemia

Condition	Anemia (low red blood cell count)
Treatment	<p>Common medications used for treating anemia are:</p> <ol style="list-style-type: none"> 1. Erythrocyte Stimulating Agents (e.g. Eryjaa, Recormon, NESP, Mircera etc.) 2. Iron containing supplements
Descriptions	<p>Erythrocytes Stimulating Agents have been instrumental in helping CKD patients avoid blood transfusions. Often given in the form of an injection, the medication 'talks' to the bone marrow and instructs it to produce the red blood cells that we need.</p>
Goal	<p>For patients yet to start on dialysis, it is often enough to ensure hemoglobin levels exceed 9.</p> <p>In dialysis patients, doctors will try to keep hemoglobin levels more than 10.</p>

Hyperlipidemia

Condition	Hyperlipidemia (high blood cholesterol)
Treatment	<p>Common medications used for treating high cholesterol are:</p> <ol style="list-style-type: none"> 1. Statins (ends with 'statin', e.g. Atorvastatin, simvastatin, rosuvastatin etc.) 2. Ezetimibe 3. Fenofibrate 4. Gemfibrozil



Living with Chronic Kidney Disease

Descriptions

Statins act by blocking an enzyme called the HMG-coA reductase which is used in the production of cholesterol. This reduces the cholesterol in the blood. Don't worry, it doesn't completely block production therefore you still have more than enough to be used by your body.

Ezetimibe blocks the absorption of cholesterol from the intestines. Used together with a statin, it can lower cholesterol quite effectively.

Fenofibrate and **gemfibrozil** are both medications that are usually used to lower Triglycerides, which is another type of fat (lipid) found in your blood.

Goal

High cholesterol is linked to unhealthy blood vessels, and may worsen the deterioration of kidney disease.

Treating high cholesterol, primarily benefits the heart and brain by reducing the risk of heart attacks and strokes.

Doctors will try to bring the cholesterol levels as low as possible. Common targets are to reduce LDL-cholesterol (so called 'bad cholesterol') to $<1.8\text{mmol/L}$.

Many people worry that taking these medications can lead to side effects including kidney failure, liver failure, dementia etc. But side effects like these are rare. If your doctor feels that you need these medications, it would likely mean the benefits outweigh the risks. However, do bring up your concerns to your doctor.





Hyperphosphatemia

<p>Condition</p>	<p>Hyperphosphatemia (high phosphate)</p>
<p>Treatment</p>	<p>Common medications used are:</p> <ol style="list-style-type: none"> 1. Calcium carbonate 2. Calcium lactate 3. Calcium acetate 4. Selvalamer 5. SuCroferric oxyhydroxide (Velphoro®)
<p>Descriptions</p>	<p>All these medications are used during mealtimes to absorb the phosphorus found in food.</p>
<p>Goal</p>	<p>Excessively high phosphorus in the blood can result in:</p> <ul style="list-style-type: none">  Low levels of calcium in the blood (bad!)  Can cause a 'stiffening' of the blood vessels (bad!)  Can result in disorders of the bone (bad!) <p>A major source of phosphorus is from our diet but certain foods have higher phosphorus content. In particular, avoid foods that contain lots of preservatives and which have been highly processed.</p>



Hyperparathyroidism

Condition	Hyperparathyroidism (high parathyroid hormone)
Treatment	Common medications: <ol style="list-style-type: none">1. Calcitriol2. Alphacalcidol3. Cinacalcet
Descriptions	Calcitriol and alphacalcidol are both derived from vitamin D. Cinacalcet is a special medication that directly tells the parathyroid gland to produce less parathyroid hormone.
Goal	The parathyroid hormone is produced from 4 little glands located next to the thyroid. Its main function is to assist in regulating the concentration of calcium in the blood and in the health of the bone.  Fun fact 'para' means 'next to'. Therefore, parathyroid means 'next to the thyroid'.

Metabolic Acidosis

Condition	Metabolic Acidosis
Treatment	Common medications: <ol style="list-style-type: none">1. Sodium bicarbonate
Descriptions	Often delivered in salt form, the important part of this medication is the 'bicarbonate'. This chemical neutralizes the acid that naturally is produced by the body during day to day activities. Some unavoidable side effects are due to salt and water retention leading to leg swelling as well as bloating in the tummy.
Goal	The kidney controls and regulates the amount of acids in the body, therefore when the kidney gets weaker, acids can accumulate and cause problems, impacting the heart and the bones. Research has also shown that higher acid levels can lead to a faster deterioration of kidney health.



Hyperuricemia (high uric acid)

Condition	Hyperuricemia (high uric acid)
Treatment	Common medications used are: <ol style="list-style-type: none"> 1. Allopurinol 2. Febuxostat 3. Colchicine
Descriptions	<p>Allopurinol and febuxostat act to block an enzyme that produces uric acid in the body. One important side effect of allopurinol is that some people can develop severe allergies to the medication, which sometimes can be life threatening (known as Steven-Johnson Syndrome (SJS)).</p> <p>Colchicine is a medication used to block the inflammation that develops when a gout attack is present. Doses need to be reduced if kidney function is poor.</p>
Goal	<p>High uric acid levels are generally treated if it causes gout (a painful deposition of uric acid crystals in the joints).</p> <p>On its own, it's still controversial whether medication benefits outweigh the risks. There is some supportive research that suggests lowering uric acid may be beneficial to slow the progression of kidney disease.</p> <p>As usual, consult your doctor.</p>

This information is for general knowledge and should not replace professional medical advice. If you have kidney concerns or an existing renal condition, it is crucial to consult with a nephrologist before starting or changing any medication.





CKD complications

The following are some of the problems that can occur due to a drop in kidney function. One or all of the following may result in:

1. Low red blood cell count (Anemia)
2. Waste product accumulation (Uremia) that can cause itching, nausea, vomiting, loss of appetite
3. Swelling, more noticeable in the legs
4. Difficulty in breathing, may be due to water accumulation in the lungs
5. Weaker and unhealthier bones
6. Gout attacks
7. Worsened blood pressure
8. Worsened diabetes
9. Higher risk of heart attacks
10. Higher risk of stroke
11. Abnormal blood chemistry like potassium, sodium, calcium and phosphorus
12. Accumulation of acids in the bloodstream
13. Lower fertility
14. Erectile dysfunction

Side effects of CKD

Men and women with advanced CKD often have difficulties with sexual function and infertility. Over 50 percent of men with end stage kidney disease have difficulties with erection and decreased sex drive. Women often have disturbances in the menstrual cycle and fertility, usually leading to a stop in menstrual periods. Decreased sex drive may also occur in women. You should discuss any changes in your sexual function with your health care provider because medications or other treatments may be effective.



>50% men with ESKD face difficulties with erection and lower sex drive

(Berns, 2023)



Golden Rules

In the chapter on Delaying CKD, we introduced the concept of a kidney friendly diet. Here, we will elaborate on it a little more. Kidney friendly diets can be as simple as keeping to a few golden rules:

1. Less eating out, you cannot control how others cook
2. Avoid fast food
3. Avoid processed foods and foods that have lots of preservatives (things that come in a can, a tin, a packet)
4. Less fried foods
5. Less salty foods
6. Avoid sugary drinks (soft drinks, bubble teas, etc.)
7. Control the amount of protein you take in a day
8. More fresh food
9. More fruits and vegetables
10. Drink enough water (what's enough? A simple rule of thumb is to look at the urine color, if it is darker yellow, you need to drink more)

Malaysian Healthy Plate

The Malaysian healthy plate is a simple guide that encourages balanced meals by filling half the plate with fruits and vegetables, one quarter with protein-rich foods like fish or tofu, and one quarter with carbohydrates like rice or noodles.



A Glass of Water

Source:
Malaysian Healthy Plate,
National Coordinating
Committee on Food and
Nutrition, Ministry of Health
(2020)



A Kidney-Friendly Diet

One of the suggestions that your doctors may advise is that you limit your protein intake per day. The general advice is that if you have moderate to severe kidney dysfunction, limiting protein to 0.6-0.8g/kg/day can help.

What does this mean?

This means that if you are a 70kg person, your total protein allowance per day is:

**[0.6x70kg = 42g, to 0.8x70kg = 56g]
42-56g of protein A DAY**

An example of protein content in foods:

Food	Calories	Protein (g)	Total fat (g)	Cholesterol (mg)	Dietary Fibre (g)
Beef (100g sirloin cut uncooked)	189	21	11	72	0
Chicken breast (100g raw, boneless and with skin)	150	18.3	7.7	78	0
Mutton (100g raw, lean cut)	128	20	5.4	72	0
Lamb (100g raw)	173	24	8	72	0
Tilapia fish (100g raw)	96	20	1.7	50	0
Salmon (100g raw)	142	20	6.3	55	0
Prawns (100g boiled)	119	22.6	1.8	214	0
Eggs (One whole egg raw)	72	6.3	5	186	0
Low fat milk (250ml)	130	8	5	19	0
Cheddar cheese (30g)	114	6.5	9.5	28	0
Almonds (30g dry roasted)	164	6	14	0	3.5
Lentils (100g boiled)	116	9	0.4	0	8
Sunflower seeds (1/2 cup)	135	5	12	0	2
Brown rice (1 cup cooked;195g)	218	4.5	1.6	0	3.5

Source: U.S. Department of Agriculture Food Nutrient Database & Nutrient Composition of Malaysian Foods, MOH (1997) - NST Infographic



Protein Options

There are many guides that are available online to assist in determining protein content. Feel free to learn more. We also encourage you to seek professional dietician advice to get a personal dietary plan specific to your medical condition.

PLANT-BASED PROTEIN

PROTEIN PER 100G



Chickpeas
7g protein



Oats
11g protein



Tofu
13g protein



Brown Rice
3g protein



Quinoa
4g protein



Lentils
6g protein



Cashews
18g protein



Peanut Butter
28g protein



Almonds
29g protein



Avocado
2g protein



Broccoli
4g protein



Edamame
12g protein

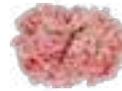
*Some incomplete proteins

ANIMAL-BASED PROTEIN

PROTEIN PER 100G



Eggs
14g protein



Minced Turkey
25g protein



Chicken Breast
25g protein



Prawns
18g protein



Tuna
25g protein



Salmon
25g protein



Pork Chop
19g protein



Ribeye
19g protein



Duck
27g protein



Semi-skimmed
Milk
4g protein



Greek Yogurt
9g protein



Edam Cheese
26g protein

*All complete proteins



Portion Control

The following is a useful guide to portion control, feel free to use it to guide your own food choices:

HAND GUIDE TO PORTION CONTROL

To avoid a calorie-packed-punch, limit pasta servings to ½ cup or about the front of your clenched fist.

Look at your fingertip. That's about a teaspoon or how much butter your toast needs.

Your thumb, from knuckle to tip, is about the size of a tablespoon. Double it for a single serving of peanut butter.

The recommended serving size of meat is 3 oz., roughly the size of your palm.

A clenched fist is roughly one cup or a double-serving of ice cream.

HAND MEASURES

Use this “handy” chart to visualize approximately sized portions for meals, snacks and recipes (examples are provided for each corresponding measurement).

- Palm** ≈ 3-4 ounces (meat, fish and poultry)
- Fist** ≈ 1 cup (cereal, soup, casseroles, fresh fruit, raw vegetables or salads)
- Thumb** ≈ 1 Teaspoon (butter, margarine, mayonnaise & oils)
- One cupped hand** ≈ ½ cup (pasta, rice, beans, potatoes, cooked vegetables, pudding & ice cream)
- Thumb** ≈ 1-2 Tablespoons (salad dressing, sour cream, cream cheese, peanut butter & hard cheeses)
- Two cupped hands** ≈ 1 ounce (chips, crackers & pretzels)

SOURCES:
 1. <http://www.cncp.usda.gov/Publications/DietaryGuidelines/2000/DG/BrochureHowMuch.pdf>
 2. <http://2222.health.arkansas.gov/programsServices/chronicDisease/Nutrition/Pages/ServingSizes.aspx>



Dialysis

The Purpose of Haemodialysis

Kidneys essentially maintain the correct balance of salt, water and other materials in the blood needed for healthy bodily functions. Any excess is filtered and excreted as waste, through urine.

Individuals living with stage 5 Chronic Kidney Disease (CKD) will have significantly diminished kidney functions (performing at below 15%) and require medical intervention to remove waste from their blood via dialysis.



Type of Dialysis

There are two types of dialysis treatments available. Each of them comes with their own advantages and drawbacks. Thus, it is important to have an in-depth discussion with your physician to determine the best option for you.

Haemodialysis



Haemodialysis is the most common type of dialysis. Often administered as an outpatient therapy, haemodialysis filters the blood through a machine known as a dialyzer. Depending on the patient's condition, haemodialysis treatments need to take place up to 3 times a week that lasts approximately 4 hours per session at a minimum.



Peritoneal Dialysis



By accessing a patient's abdominal cavity lining (peritoneum), peritoneal dialysis removes excess fluid and other waste products. By introducing a dialysate fluid into the abdominal cavity through an implanted catheter (infusion), waste products diffuse across the peritoneum from the blood vessels. After about four to six hours, the fluid is drained and the process is repeated four times a day. Peritoneal dialysis can be conducted by the patient independently, with guidance from the dialysis team.

How Does Haemodialysis Work

Prior to dialysis, a patient will need to surgically introduce an access point on the non-dominant arm for the dialysis treatment. This comes in the form of an arteriovenous (AV) fistula or an AV graft that is determined by the doctor.

During the treatment, the patient's blood is drawn out of their body, into the dialyzer to remove the waste products. The filtered blood is then returned into the body. Only a small amount of blood (less than 460ml) is outside the body at any given time.





Risks And Side Effects

Like any other medical treatment, dialysis comes with its share of risks and side effects. However, by working closely with the DaVita team, taking on the advice and maintaining utmost care, the risks can be minimised, and the side effects can be managed.

Helping You Get The Best Out Of Your Treatment

Haemodialysis is a very personal experience. Thus, it is important to be well prepared and comfortable with your treatment path. Here are a few tips to help you in your journey:

Don't Be Afraid To Ask



It is important to know about the state of your condition and learn from your kidney care team. Never be afraid to voice your concerns or enquiries about your treatment.

Have Conversations And Mobilise Your Support System

Speak to loved ones about your dialysis experience and how it makes you feel. When people around you are aware of your feelings, they are more likely to help you in the way that you need. It also helps to reach out to other dialysis patients too. They are often the best people to help you navigate through the highs and lows of your dialysis journey.



Location! Location! Location!



Map out the dialysis centres and facilities that are most convenient for you in order to plan the necessary logistics.



Beyond CKD

Don't Quit On Living Life

Dialysis is life-changing but it does not mean that living your best life has to stop. Finding ways to adapt your existing hobbies and employment is important for your mental health and wellbeing.



Eat Well For The Kidneys



Pay attention to what you eat. DaVita has a huge resource of how to get the most out of a kidney-friendly diet and strategies to stay on it, with minimal effort.

A Wealth Of Support At DaVita

Discovering that you need dialysis or a transplant can be life-altering. It is important to enlist the right people to help you in your journey. DaVita Malaysia is committed to helping patients attain the best quality of life by offering world class dialysis treatments and a suite of holistic services to promote general wellbeing.





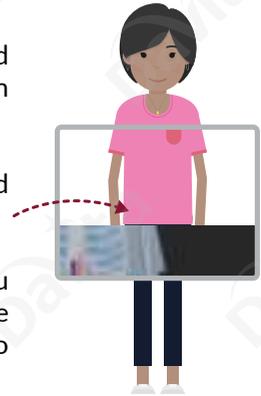
Kidney Transplant

What is a transplant?

Transplant is when you take a body part from one person and put it in another person. Kidneys are the most common organ transplanted in Malaysia and worldwide.

The transplanted kidney takes over the work of your failed kidneys. It's amazing!

This means that after a successful kidney transplant you don't need dialysis. It's the best treatment for many people with kidney failure. It can help you feel as close as possible to life before dialysis.



97%

of kidney transplants are working 30 days after surgery.

97%

of living donor kidney transplants are working one year after surgery (93% of deceased donor transplants).

83%

of kidney transplants are working 3 years after surgery.

Unfortunately, transplanted kidneys usually don't last forever. On average, kidney transplants from living donors last 12–20 years (8–12 years for deceased donor kidneys). Some people get multiple kidney transplants over their lifetime.

Transplant is a treatment, not a cure



While kidney transplant is a cure for dialysis, it is not a permanent cure for kidney disease. You'll need to do your part to keep the new kidney healthy. This means taking medicines every day, seeing your doctor regularly, eat healthily, lead an active lifestyle and more.

However, almost everyone that has a transplant agrees on one thing: it's all worth it. The surgery. The daily medicines afterwards. It's all worth having the freedom and energy that comes with a working kidney.



Your Emotions & Chronic Kidney Disease (CKD)

When patients seek medical attention for chronic kidney disease (CKD), they want relief from the physical unease it causes. But many people do not realize there is psychological unease that results when diagnosed with a chronic disease like CKD.

Caring for your mental health is just as important as caring for your physical state. Recognizing emotions that are common to other patients with CKD can help you feel less isolated and get you the support you need.



Patients are able to tell their doctors what they are physically feeling: pain, fatigue, dizziness, etc. However, many people do not feel comfortable telling their healthcare team about what they are mentally feeling. Your psychological recovery is an important part of managing CKD. The following are common emotions patients experience when they have been initially diagnosed with a chronic illness, although these emotions can be present at any time during treatment.





Fear and Anxiety

Fear and anxiety are common emotions when you have been diagnosed with a chronic disease like CKD. We feel our own bodies have betrayed us. Functioning kidneys are something you've taken for granted. Now, you are no longer in control of your renal process. You must rely on dialysis to do your kidneys' job. You will wonder how this disease will affect you. You may worry about its impact on how you care for and provide for your family.



Treatment for CKD sometimes compounds the anxiety. Whether you will undergo hemodialysis or peritoneal dialysis (PD), each requires surgery to create an access. Choices need to be made if you will go to a clinic for dialysis or be treated at home. You may worry about the disruption to your family life, especially if you opt for treatment at home. Will your loved ones adjust to seeing you attached to a machine? Will they dislike the constant reminder that you are not as healthy as you once were?



Denial

When something bad happens to us, we try to cope. We make decisions that can help us adjust to or understand what has happened. But when the trauma is severe and threatens to overwhelm us, we sometimes deny anything has happened.

Although this occurs in extreme cases, this can happen if you have been diagnosed with a chronic illness. You may refuse to accept the fact you are ill, or if you do, you may refuse to believe you are seriously ill. Perhaps you do not believe the recommended medications and treatments are necessary.



Anger

Feelings of anger are common among CKD patients. We are mad that this has happened to us. We are mad at ourselves for allowing our health to deteriorate to this point. Sometimes we are mad at the medical community for not taking better care of us or not diagnosing the disease earlier. Many patients direct this anger at their family members or spouse. Anger and resentment can build to the point where it strains the relationship between you, your health care team and your family.

Feeling Down

Feeling down is a normal part of chronic kidney disease. Lack of energy and nausea are common symptoms of CKD. But when we are feeling mentally down, often we feel sad our bodies are not functioning as they should.



We all go through ups and downs in life. But if these feelings develop into hopelessness, despondency or despair and last over two weeks, you should tell your doctor. This may be a sign of depression. If you feel you do not wish to live any longer or have thoughts of ending your life, you must tell someone immediately.



Depression

Depression is commonly reported in patients with chronic kidney disease and patients on dialysis. Depression occurs due changes in lifestyle and is associated with loss of function and dependence on others for help.

It is important to recognize depression as it has been linked to increase in death rates, prolonged hospital stay, non-compliance to medications and skipping dialysis sessions. Patients with major depressive episode (MDE) are three times more likely to progress to end stage renal disease and maintenance dialysis compared to patients without MDE.

Signs of depression

Depression can mimic the symptoms of many other illnesses. Only a qualified professional can make a diagnosis based on the description of your symptoms.

Have you experienced any of the following?

- Constant sadness, especially when circumstances would lead most people to be happy
- More difficulty than usual with making decisions
- Easily upset and/or more irritable than usual
- Being tired all the time
- Sleeping more or less than usual
- Waking up early in the morning, if this had not been your normal routine
- Not wanting to eat or wanting to eat more than usual
- Constant thoughts of death (Seek professional help immediately.)



How to deal with all of these?



Talk about how you are feeling

If you are feeling down, anxious or having difficulty coping with every day things, talk about it with your social worker and your doctor. They can provide an assessment, counseling and refer you to additional support services in your community.



Stay on top of your physical health

Caring for your physical health—such as receiving dialysis as prescribed, following your personalized kidney diet, taking medications as prescribed, exercising and getting enough sleep—may help you feel better. Even something as simple as walking on a consistent basis can make a big difference in how you feel. Avoiding or limiting substances such as nicotine, alcohol and caffeine can help prevent disruption of a good night's sleep, too.



Find support groups

You are not alone in your journey with kidney disease and dialysis. Whether you're a patient or a care partner, joining a support group is a great way to help manage your mental health. Find groups in your area by seeking out online support from people in a similar situation. It's a great way to share your experiences, ask questions, and get tips on managing your diet, work, family, stress and more.

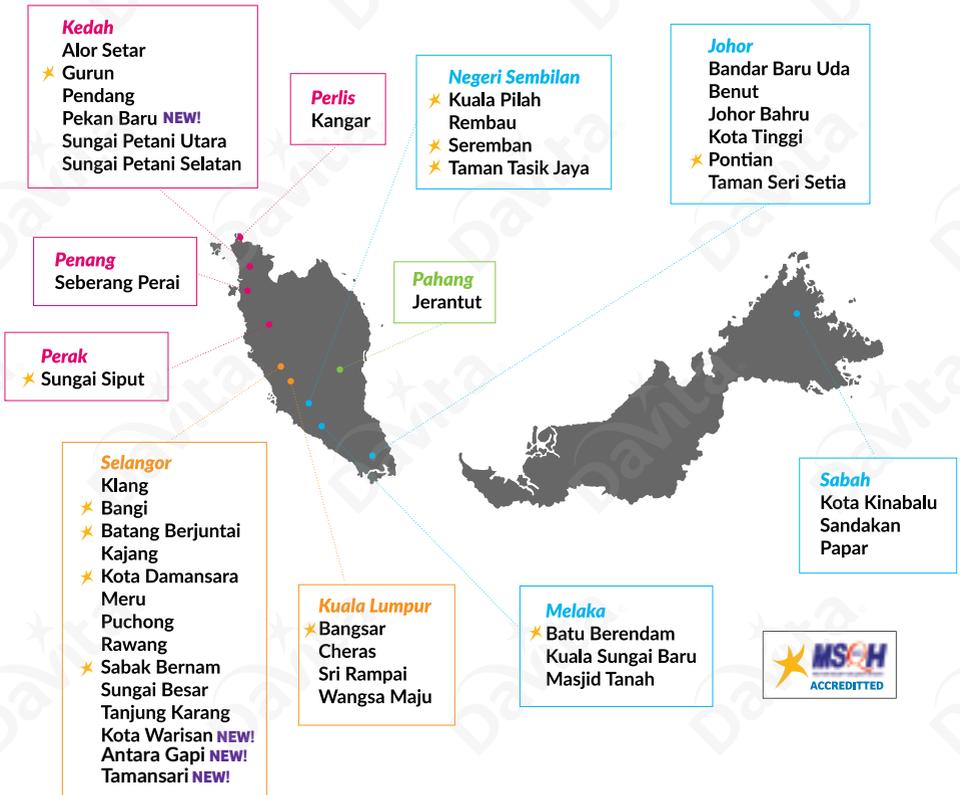


Do something you enjoy

Have fun! Doing something you enjoy can help pick you up when you feel down. Get back into the hobbies you've missed, read a book, watch a comedy, phone a friend or try something new.

CENTRES LOCATION

With 40+ centres nationwide and growing, DaVita is the first standalone dialysis provider in the country to receive accreditation for twelve (12) of the centres by the Malaysian Society for Quality in Health (MSQH).



CENTRES DIRECTORY

NORTHERN REGION

Kedah

Pusat Dialisis DaVita Alor Setar

17, Jalan Bistari 1, Taman Bistari,
05400 Alor Setar, Kedah.

Pusat Dialisis DaVita Gurun

No. 49, Ground Floor, Pekan Gurun, 08300
Gurun, Kedah.

Pusat Dialisis DaVita Pendang

No. 11, Kawasan Perniagaan Kiara Mas,
Jalan Tanah Merah,
06700 Pendang, Kedah.

Pusat Dialisis DaVita Pekan Baru

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Pekan Pendang Baru, 06700 Pendang,
Kedah.

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Heights,
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Midah, 56000 Cheras,
Kuala Lumpur.

Pusat Dialisis DaVita Sri Rampai

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Taman TTDI Grove, 43000 Kajang,
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Sunsuria City @ Sepang, 43900 Dengkil,
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Batang Kali, Selangor

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Bidara Setia,
78300 Masjid Tanah, Melaka.

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80000 Johor Bahru, Johor.

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Pusat Perdagangan Pontian,
82000 Pontian, Johor.

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117, Jalan Damai, Taman Seri Setia, 80300
Johor Bahru, Johor.

EAST MALAYSIA**Sabah****Pusat Dialisis DaVita Kota Kinabalu**

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90000 Sandakan, Sabah.

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