



HERBAL EXTRACT
COMPANY

THE NATUROPATH'S GUIDE --- CHRONIC KIDNEY DISEASE

A focus on the herbal approach
for managing chronic kidney disease

WRITTEN BY CHRISTINE THOMAS
PUBLISHED FEBRUARY 2025

PERILLA
(*Perilla frutescens*)

CHRONIC KIDNEY DISEASE

Chronic kidney disease (CKD) is a quiet epidemic which is building around the world. CKD is the umbrella term used for a number of conditions that cause the gradual loss of kidney function over a period of at least three months. It is an insidious, multifactorial and slowly progressive disease mostly diagnosed at more advanced stages when symptoms become more apparent. Identifying the underlying cause of CKD is integral to its treatment and management.¹

CKD is the third-fastest-growing cause of death globally. Therefore, it has become a major public health problem on a global scale. Delaying or preventing the progress of CKD has become an important challenge facing the clinical medicine community and the health departments of various countries. In Australia, one in three adults is at increased risk of developing CKD, and one in ten has some sign of the disease. Like other chronic conditions, prevalence of kidney disease increases with age. People aged 75 years and over are more likely than any other age group to have kidney disease.^{2,3}

And yet, overwhelmingly, less than 10% of individuals with CKD are aware they have the disease due to the asymptomatic nature of the condition and because diagnosis requires the presence of measured biomedical markers that persist for at least three months. This means

that the majority of CKD in Australia is undiagnosed. As a result, this makes estimating the true incidence of CKD challenging and numbers based on self-report are often underestimates of the true number of people living with CKD in Australia. Kidney disease now accounts for more deaths than breast cancer, prostate cancer and car accidents all put together, and the death rate is projected to increase. The good news, however, is that the progression of kidney disease can be slowed or even stopped if caught early enough so it is important to be proactive. This sombre scenario emphasises the need for strategies to slow the onset and progression of CKD. With rates rising around the world prevention, treatment, funding and data are important priorities.^{4,5}

6,7

CKD used to be called chronic renal failure but was reclassified in 2002 because

CKD can refer to all stages of kidney disease, from early to end-stage. The term “kidney failure” is now used to refer to end-stage renal disease, which is when the kidneys have lost about 85% of their function. The kidney has a large capacity for compensation which means people can lose up to 90% of renal function and be seemingly asymptomatic. For example, you can donate one kidney and remain healthy. CKD, like a lot of chronic diseases, develops over decades. This means if a patient is overweight and dehydrated in their twenties they are on a trajectory for CKD. This damage can cause dangerous levels of fluids, electrolytes and wastes to build up in the body. CKD can also cause other health problems. When people finally start to experience symptoms such as itchy skin, an impaired ability to urinate and unexplained weight loss, among others, it means the disease has reached an irreversible stage. As kidney disease gets worse, a person may have swelling, called oedema. Oedema happens when the kidneys cannot get rid of extra fluid and salt. Oedema can occur in the legs, feet, or ankles and less often in the hands or face. When the kidneys are damaged beyond their capacity to work properly the options are either a transplant or a lifetime of dialysis, which are lifesaving but have many complications.^{8 9 10}

Condition Overview

The goal of the two bean-shaped kidneys, at the heart of the urinary system, is to maintain homeostasis so they have many functions. The most well known is to essentially ‘clean’ the blood by filtering out extra water, waste products and toxins to make urine. They do this with about one million small tubes each called nephrons, which are functional units that independently filter the blood. About 180 litres of blood pass through

healthy kidneys every 24 hours, of which only about two litres is excreted as urine. CKD is due to the irreversible and gradual loss of large numbers of these functioning nephrons. The nephron consists of the glomerulus, where fluid and some solutes are filtered from the blood.¹¹

When nephrons are lost, other nephrons take on a larger load. They adapt and excrete normal amounts of water and solutes until the kidney is reduced to 20 to 30% normal nephron mass. Over the years, the glomeruli are injured. It is thought this injury is caused by the increased pressure and stretch from the increased blood pressure on the glomeruli. This eventually causes sclerosis (scar like tissue) and further destruction of the kidneys.¹²

While the kidney can repair itself after some injury, it cannot regenerate new nephrons. All nephrons are developed in the womb before birth and the kidney is unable to create more after that. Renal injury, disease and aging will decrease the number of nephrons. After the age of 40, the functional nephrons begin to decrease by 10% each year due to benign nephrosclerosis. The remaining nephrons adapt to take on the increased workload. 70% of the functional nephrons can be lost before clinical symptoms appear. When kidney function fails the resulting kidney failure, if untreated, is lethal within a few days. Death is due to a combination of acidosis, a high concentration of potassium and accumulation of fluid.¹³

The kidneys are crucial to the regulation of electrolytes and fluid and help to maintain a proper balance of salts and minerals in the body, such as calcium, phosphorus, sodium and potassium. The kidneys also have endocrine functions which make hormones that help regulate blood pressure, absorb glucose and activate vitamin D.¹⁴

CKD refers to abnormalities of kidney structure or function for three months or more. Because of this, excess fluid and waste from the blood remain in the body and may cause other health problems such as heart disease and stroke, in addition to kidney failure. CKD is related, but separate, to kidney stones and urinary tract infections. It is graded into five progressive stages (Stage 1, 2, 3a and 3b, 4 and 5) based on glomerular filtration rate (GFR). While not progressive in everyone, CKD progresses in many people to total and permanent kidney

failure, or Stage 5 CKD. Kidney failure occurs when the kidneys can no longer function adequately, at which point people require kidney replacement therapy, either a kidney transplant or dialysis, to survive. While it is lifesaving, dialysis is not treating the cause and is big business (the financial system creates an incentive to not treat the cause).^{15 16 17}

CKD can occur for a variety of reasons but the rise of CKD in recent years is linked to dramatic increases in obesity and obesity-associated cardiovascular risk factors such as lipid abnormalities, atherosclerosis, diabetes and high blood pressure. Although these comorbid conditions may develop separately, they often co-exist and may increase injury of target organs, including the kidneys, in an additive or synergistic fashion.¹⁸

Of these, the major causes of CKD are diabetes and hypertension, which lead to progressive microvascular damage and loss and set the stage for evolving renal injury. If someone has diabetes, high blood sugar can clog and narrow the kidney's tiny blood vessels, leading to kidney damage. In people with high blood pressure there is an increase in the force of blood pushing against vessel walls throughout the body, including in the kidneys, affecting their ability to eliminate waste and extra fluid from the body. Other issues that can lead to CKD include glomerulonephritis, an inflammation of the glomeruli, the tiny filters in the kidneys; lupus nephritis, an autoimmune disease; polycystic kidney disease; IgA nephropathy, also known as Berger's disease, a chronic kidney disease that occurs when the immune system protein immunoglobulin A builds up in the kidneys and kidney cancer.¹⁹

Like the brain, the kidneys are a very vascular organ and require a large amount of blood to function properly. Therefore, regardless of the cause (hypertension, diabetes, atherosclerosis, obesity etc.) CKD universally associates with endothelial dysfunction and microvascular rarefaction (loss of microvessels). A progressive damage of the microcirculation deteriorates renal blood flow and delivery, leading to a progressive loss of filtration, tubular function and development of fibrosis, which, in turn, serves as a feedback mechanism that may further accelerate progression of CKD towards irreversible renal injury. Targeting the renal microvasculature offers a therapeutic niche to improve current treatments.²⁰

Common Symptoms

Kidney disease is called a 'silent disease' as in the early stages there are often few or no symptoms so detecting it is difficult. As kidney disease progresses (gets worse), patients may start feeling unwell. Symptoms and signs of the middle and late stages of CKD can include:

- a change in the frequency and quality of urine passed, especially at night (usually an increase at first)
- blood in the urine (haematuria)
- changes in the appearance of urine or persistently frothy or foaming urine
- puffiness around legs, ankles or around the eyes (oedema)
- pain in the back (under the lower ribs, where the kidneys are located)
- pain or burning when passing urine
- high blood pressure

If the kidneys begin to fail, waste products and extra fluid build up in the blood. This, and other problems, gradually leads to:

- tiredness, low energy and inability to concentrate
- generally feeling unwell
- headaches
- loss of appetite
- nausea and vomiting
- shortness of breath
- itching
- bad breath and a metallic taste in the mouth
- pins and needles in the fingers or toes
- restless legs²¹

Risk Factors

CKD is largely preventable as a number of its key risk factors are modifiable. The CKD risk factors are very similar to cardiovascular disease and type 2 diabetes with a lot of overlap.

Nonmodifiable risk factors

Age: Risk increases with age, with people over 65 most likely to be diagnosed with CKD. The longer a patient has had diabetes, high blood pressure or heart disease, the more likely they will have kidney disease.²²

Family history: People with first-degree relatives affected by CKD are at higher risk, and those with other relatives who have the condition have an elevated risk as well. If there is a family history of CKD, kidney failure, or inherited kidney disorders, patients should talk with their practitioner about kidney health when they are in their twenties. A young patient may not have CKD that will impact their life for the next 10 or 15 years, but steps can be taken to lower their risk as they age.²³

Race, ethnicity and socioeconomic issues:

Indigenous Australians have a greater burden of disease for many health conditions, and CKD is no exception. Indigenous Australians were found to be more likely to have end-stage kidney disease, and be hospitalised or die with CKD, than non-Indigenous Australians.²⁴ African Americans, Hispanics and American Indians tend to have a greater risk for CKD. The greater risk is multifactorial and due mostly to higher rates of diabetes and high blood pressure among these groups. It is also related to access to health care. Affordable medications can be a factor in some cases. Scientists are studying other possible reasons for this increased risk.²⁵

Modifiable risk factors

Diabetes (type 1 or 2): Diabetes is the leading cause of CKD. High blood glucose, also called blood sugar, from diabetes can damage the blood vessels in the kidneys. Almost one in three people with diabetes has CKD.²⁶

High blood pressure: Also known as hypertension, this is the second leading cause of CKD. Like high blood glucose, high blood pressure can also damage the blood vessels in the kidneys. Almost one in five adults with high blood pressure has CKD.²⁷

Obesity/Overweight: Because obesity is intimately linked to diabetes and hypertension, and is linked to renal alterations, it has been identified as one of the major causes of chronic CKD.²⁸

Heart disease: Research shows a link between kidney disease and heart disease. People with heart disease are at higher risk for kidney disease, and people with kidney disease are at higher risk for heart disease. Researchers are working to better understand the relationship between kidney disease and heart disease.²⁹

Past damage to the kidneys from an infection or surgery:

Acute kidney injury, including renal stones or kidney infection, and CKD are closely linked and can promote each other. Acute kidney injury can contribute to the development and progression of CKD, and CKD is a risk factor for the development of acute kidney injury. The relationship between acute kidney injury and CKD is complex, and the exact mechanisms are still being studied.³⁰

Polycystic kidney disease: This is a genetic disorder that causes fluid-filled cysts to grow in the kidneys, causing the kidneys to lose their ability to filter waste from the blood, leading to CKD and potentially kidney failure. The cysts gradually grow, making the kidneys larger and reducing the healthy kidney tissue.³¹

Low physical activity: Studies suggest that physical activity can help prevent CKD and improve the health of people with CKD. Regular physical activity can help people with CKD in many ways including improving heart health, managing blood sugar, improving mental health, maintaining weight, maintaining muscle mass, improving sleep and kidney function.³²

Poor diet: A poor diet can contribute to body weight and hypertension. The Western-type dietary pattern is significantly associated with higher risk of CKD. Diets high in animal protein can make it harder for the kidneys to protect themselves from injury. Diets low in fruit and vegetable intake and high in fat and sugar and acid load are associated with a higher risk of CKD. Ultraprocessed foods can trigger addictive eating behaviors and may increase the risk of CKD.³³

34 35

Gut microbiome: Dysbiosis, a disruption in the balance of gut microbial communities, has been observed in CKD patients. The gut microbiota influences nutrient metabolism and produces metabolites that impact various organs, including the kidneys. Dysbiosis contributes to inflammation, oxidative stress and uremic toxin accumulation, all of which exacerbate CKD progression. Recent evidence suggests that intestinal hyperpermeability, commonly known as “leaky gut”, may be an initiating factor in CKD. This can trigger systemic inflammation and contribute to kidney damage. Addressing intestinal hyperpermeability early in CKD management could potentially slow disease progression.³⁶

Tobacco smoking: Current smokers are at an increased risk of developing CKD compared to non-smokers. The risk increases with the amount smoked and is especially high for those with diabetes or high blood pressure. Smoking can damage the kidneys by increasing blood pressure and heart rate, damaging blood vessels and reducing blood oxygen levels.³⁷

Chronic dehydration: Dehydration can lead to changes in the kidney's structure and function. Dehydration can also cause hyperuricemia (a condition where there are abnormally high levels of uric acid in the blood), which can contribute to CKD. Low urine flow can also lead to hypertension, which is a major risk factor for CKD.³⁸

Microplastics: Microplastics (MP) are tiny particles of plastic, typically less than 5mm in size, that have become a pervasive environmental concern. They are present in air, water, food and, increasingly, within the body. While the health implications of these particles are still being researched, recent evidence suggests a worrying link between MP exposure and kidney damage. The kidneys, essential for filtering toxins and waste from the body, may be particularly vulnerable to the toxic effects of these particles.³⁹

Nitric oxide deficiency: Nitric oxide (NO) plays a role in many physiological processes that control

kidney function including promoting natriuresis (the process by which the kidneys excrete sodium in urine) and diuresis, helping the body adapt to changes in dietary salt intake and maintaining normal blood pressure. NO deficiency can contribute to the progression of kidney damage and cardiovascular events. The body produces less NO in people with CKD. This can be due to a number of factors including endothelial dysfunction and reduced substrate availability, such as less L-arginine which is used to produce NO. This could be because the body is less able to synthesise L-arginine (which can be supplemented) in the kidneys, or because it is less able to transport L-arginine into endothelial cells. Interventions that can restore NO production are likely to reduce the cardiovascular complications of CKD as well as slowing the rate of progression.⁴⁰

How To Get The Correct Diagnosis

Because CKD requires signs of reduced kidney function or damage to be present for at least three months, diagnosis involves biomedical assessments (blood and/or urine tests) to be repeated more than three months apart. This can make the disease more difficult to detect and diagnose. Fortunately these simple tests, performed by a general practitioner, can identify most cases of CKD when the disease is in its early stages, enabling treatment to prevent



or slow progression and reduce the likelihood of developing kidney failure. Given the rates of under-diagnosis, and the high burden of CKD, targeted screening of individuals at increased risk of developing CKD due to the presence of one or more risk factors, and performing kidney health checks of those people, is the clinical protocol recommended in Australia for detecting CKD. Monitoring of CKD depends on the level of kidney function, with worse function requiring more assessments.

Clinically, CKD is defined as one of the following being present for three months or more:

- Estimated or measured glomerular filtration rate (eGFR/GFR) of less than 60mL, with or without evidence of kidney damage.
- Kidney damage with or without decreased GFR, indicated by any of the following:
 1. Albuminuria: a condition caused when the kidneys cannot filter large protein molecules out of the blood, so they pass into the urine
 2. Haematuria: the presence of blood in the urine, not caused by another condition
 3. Structural abnormalities, for example abnormally small kidneys
 4. Pathological abnormalities, for example interstitial nephritis (inflammation of part of the kidneys).

Standard monitoring of CKD requires the following tests:

- Urinary albumin-creatinine ratio (urine ACR) is a urine test to detect the presence of albumin (protein) in the urine, which would normally be filtered out by the kidneys. If kidney function is reduced, protein may pass from the blood into the urine, causing albuminuria. Albuminuria is indicative of CKD, even if other tests are normal.
- Estimated glomerular filtration rate (eGFR) is a blood test that provides an indication of how well the kidneys are filtering waste from the blood. It is used to diagnose the stage of CKD and to monitor progression of the disease. A blood test also measures the level of waste products in the blood, such as creatinine and urea. Creatinine is a waste product, resulting from the normal breakdown of muscle tissue and digestion of protein from food; too much of it in the blood is a sign that the kidneys are not

cleaning out waste efficiently.

- Electrolytes is a blood test that measures sodium and potassium levels in the blood, which should be properly balanced to maintain the normal function of metabolic processes.
- Glycated haemoglobin (HbA1c) is the main biomarker used to assess long-term glucose control in people living with diabetes. It forms part of monitoring CKD only in people with diabetes.
- Fasting lipids are used to determine cardiovascular disease risk and monitor disease progression. Dyslipidaemia, or an altered lipid profile in the blood, can accelerate the rate of kidney function decline.
- Blood pressure tests are needed to identify high blood pressure, which can both cause and exacerbate CKD. Controlling high blood pressure is an important component in the treatment and management of CKD.

Additional assessments that may be required depending on kidney function include:

- Full blood count can detect anaemia (deficiency in the number or quality of red blood cells) and monitor iron levels. Anaemia is a common complication of CKD and can cause damage to other organs as well as reducing quality of life in severe cases.
- Calcium and phosphate need to be maintained at healthy levels to help protect against heart disease and stroke, and to prevent bones from weakening. In more advanced stages of CKD the kidneys do not activate Vitamin D, which is necessary for the body to absorb calcium and phosphate. Calcium and phosphate levels may need to be controlled through diet and the use of phosphate binders and Vitamin D supplements.
- Parathyroid hormone (PTH) can detect hyperparathyroidism, which disrupts calcium levels and can lead to kidney failure.
- Imaging tests, such as an ultrasound or CT scan can, look for abnormalities in the kidneys and urinary tract.⁴¹

CKD is classified into five stages, depending on the level of kidney function which are determined by eGFR scores that remain consistent for at least

three months:

- **Stages 1 and 2:** eGFR: 60 or higher with albuminuria, haematuria or a pathological or structural abnormality. There are usually no symptoms as the kidneys are still able to function adequately when they are slightly damaged. This makes diagnosis difficult. The eGFR is normal (90 or higher stage 1) or slightly reduced (between 60 and 89 stage 2). The risk of disease progression depends on albuminuria levels.
- **Stages 3 and 4:** eGFR between 15 and 59, with or without albuminuria. The level of waste (urea and creatinine) in the blood rises and a person may start to feel unwell. Kidney function is reduced and blood pressure rises. This is usually when diagnosis occurs. Stage 3 is marked by a moderate reduction in eGFR (between 30 and 59) and is divided into stage 3a and 3b. At this stage CKD can cause complications such as anaemia and bone disease. Although some people still may not have symptoms many experience one or more of a range of symptoms including feeling weak and tired, lower back pain, dry or itchy skin, urinating more or less than usual, or having foamy or darker-coloured urine. Although at this point the kidneys are irreversibly damaged and do not work as well as they should, with treatment and healthy lifestyle changes, many people in this stage do not move to Stage 4 or Stage 5. Stage 4 is marked by a severe reduction in eGFR (between 15 and 29). This is the last stage before kidney failure, when damage is severe. The kidneys have a difficult time filtering out waste, which then builds up in the body where it can cause a variety of health problems, including heart disease and stroke. Patients and their providers should begin to plan for future dialysis or a kidney transplant.
- **Stage 5:** kidney failure (also known as end-stage kidney disease) eGFR less than 15 or on dialysis. This is marked by substantial loss of kidney function. The kidneys are no longer able to adequately filter waste from the blood and the person requires kidney replacement therapy, either dialysis or a kidney transplant, to stay alive. The risk of progression is very high.

Symptoms of kidney failure may include some of the issues that some people start to experience in Stage 3, along with some new ones such as rashes; foamy, frothy, or bubbly urine; feeling less hungry than normal and feeling sick in the stomach and throwing up.⁴²

Early detection and treatment of CKD is important because it can reduce the burden of kidney failure and the associated cardiovascular morbidity and mortality. The best thing to protect the kidneys is to regularly see the primary care provider and, if relevant, share any family history of kidney disease or dialysis. A yearly physical and bloodwork every two or three years is encouraged to catch CKD. If there is an abnormality, such as an elevated level of creatinine, then it is recommended to repeat the bloodwork once a year.⁴³

For anyone with diabetes, high blood pressure or heart disease, and/or who is 65 or older, it is especially important to talk to a doctor about CKD risk. People who are young and healthy but have a first-degree relative with a history of kidney disease or dialysis should consider being screened to make sure that nothing is missed that would put them at risk as they age.⁴⁴

As with many diseases, preventing a serious condition from developing also comes down to good general health which includes eating a diet rich in fruits and vegetables and low in salt, fat and sugar; drinking enough water; being active for at least 30 minutes most days; sleeping seven to nine hours each night; avoiding smoking and minimising alcohol intake. Good general care can mean early diagnosis and treatment, which can keep people healthy.⁴⁵

Conventional Treatment & Prevention

There is no cure for CKD so management of the disease and its symptoms is the primary form of treatment. The earlier CKD is detected, the better the outcomes for halting or slowing its progression. One of the main goals of primary health care for CKD is the preservation of kidney health. Depending on the stage of CKD a person is in, there are a variety of management options available. The best treatment option depends on the person being

treated and the underlying condition that caused CKD. Treatment options may include lifestyle modifications and medication. Supportive care can also be a part of the treatment and management of CKD, which focuses on helping a person live the best life possible regardless of what stage of CKD they are in or what treatments they are receiving. The choice of treatment for CKD is a personal decision, and depends on many factors including age and expected quality of life. The decision is made collaboratively by the person with CKD, their families and their care team. Many people start on one treatment type and then transfer to another for many different reasons.⁴⁶

Treatment and management of CKD may include:

- Lifestyle changes: These can include eating well, exercising, maintaining a healthy weight and quitting smoking.
 - Medications: These can help control associated problems such as high blood pressure and high cholesterol. Some drugs, such as angiotensin-converting enzyme (ACE) inhibitors and angiotensin blockers, can also stop kidney damage. ACE inhibitors are a common treatment for CKD and proteinuria. They can help reduce the risk of kidney failure and major cardiovascular events. They can also help keep the glomeruli, or small filters in the kidneys, healthy. They are a type of renin-angiotensin system (RAS) inhibitor that work by reducing blood pressure and slowing the decline in estimated glomerular filtration rate (eGFR). People with CKD are often prescribed multiple medications which can change over time as their
- condition changes. In the past few years several relatively new CKD medications have become available. Some of these are also used to treat diabetes, and other CKD-related conditions, including obesity and heart disease. Poor kidney function can weaken bones, so calcium and vitamin D supplements may be prescribed to keep them strong. Diuretics, which can help kidneys eliminate salt and water and facilitate urination, may be used to reduce swelling. Iron supplements can help address anaemia. It may also be important to stop taking certain medicines that can worsen kidney damage, such as nonsteroidal anti-inflammatory drugs (NSAIDs) and some arthritis medicines.
 - Dialysis: This is a kidney replacement therapy that removes waste products from the blood and regulates fluids. There are two types of dialysis: haemodialysis and peritoneal dialysis. Haemodialysis uses a machine to filter the blood outside the body while peritoneal dialysis uses the lining of the belly to filter the blood inside the body.
 - Kidney transplant: This is a surgical procedure that involves placing a healthy kidney from a donor, either living or deceased, into the body. This is the most effective treatment for kidney failure and can improve quality of life and increase life expectancy.
 - Comprehensive conservative care: This option focuses on symptom control and quality of life, and uses medications and diet to manage the disease.⁴⁷



INTERVENTION	Adaptogen	Antihypertensive, antidiabetic	Antioxidants, anti-inflammatory, antifibrotic	Nephroprotective, kidney tonic	Immunomodulator
Astragalus	✓	✓	✓	✓	✓
Codonopsis	✓		✓	✓	✓
Cordyceps	✓	✓	✓	✓	✓
Ginkgo			✓		
Gotu Kola	✓		✓	✓	✓
Green Tea		✓	✓	✓	✓
Hawthorn		✓	✓	✓	
Perilla		✓	✓		✓
Rehmannia	✓	✓	✓	✓	✓
Reishi	✓	✓	✓	✓	✓
Rhubarb			✓	✓	
St Mary's Thistle			✓	✓	

“It is not uncommon for early to mid-stage CKD patients to be delivered a diagnosis... and if there are no symptoms to then be told by the medical system there are no interventions that can be done but just monitor and wait for the disease to progress (i.e. wait for their kidneys to fail)... the shoulders are shrugged and the waiting game for

dialysis begins, without having even considered the underlying causes. This is a travesty as there is enormous therapeutic potential that is lost during these early stages to aid and even reverse the process with the use of naturopathic and herbal medicine. The need for dialysis and transplant as the main treatment can be prevented.”



Astragalus
(*Astragalus membranaceus*)

Natural Therapies For Treatment & Prevention

CAUTION: The recommendations given in this guide are of a general nature. There are many things that can cause damage to the kidneys, including pharmaceuticals. Practitioners need to proceed with extreme caution, especially with significant renal pathology, as the kidney is vulnerable to further damage with any new active metabolites. When it comes to herbal medicine be cautious when using any natural substance, especially herbs with known toxicity, because the differences in metabolism may change a safe dose into a toxic dose. Only use quality herbs with a high safety profile so as to avoid nephrotoxic effects. When prescribing for kidney patients it is recommended to treat them in the same manner as pregnant patients. There have been reported cases of kidney damage linked to the intake of herbal supplements, most often due to contamination of raw materials, misidentification or substitution of plants. Nevertheless, there is case report evidence suggesting that some herbal remedies might be beneficial to support kidney function. Prescribe herbs with traditional evidence. To mitigate the risk of harm from herbal or nutritional medicines use practitioner-only supplements from reliable suppliers, which are independently tested and verified, prescribed by an experienced naturopath with a solid knowledge of CKD, dialysis and drug interactions. The best health outcomes arise from good communication and strong relationships with medical teams. Create a plan that offers the best that both orthodox medicine and naturopathic medicine have to offer. Herbal medicine is best avoided in transplant patients unless by a very experienced practitioner.^{48 49 50}

Naturopathic support for the kidneys tends to have been overlooked in training, and many naturopaths are taught that kidney disease is too complicated, resulting in renal and kidney health becoming a 'black hole' in naturopathic medicine. And yet research suggests there is much in the naturopathic tool kit that can make an enormous difference to this system. CKD can only be prevented, or slowed down, if treatment begins in the early stages. The

more the function declines the harder it is to slow that down, a bit like a snowball effect. There is a lot that can be done at the later stages, and there is a lot that can be done to potentially delay the need for dialysis, but it can be quite hard to reverse depending on what the underlying issue is with the kidney. It is not uncommon for early to mid-stage CKD patients to be delivered a diagnosis, after standard diagnostic tests, and if there are no symptoms to then be told by the medical system there are no interventions that can be done but just monitor and wait for the disease to progress (i.e. wait for their kidneys to fail). If the patient does not have diabetes, hypertension or heart disease, then the shoulders are shrugged and the waiting game for dialysis begins, without having even considered the underlying causes. This is a travesty as there is enormous therapeutic potential that is lost during these early stages to aid and even reverse the process with the use of naturopathic and herbal medicine. The need for dialysis and transplant as the main treatment can be prevented.^{51 52 53}

Being aware of the many current systemic problems in the approach to CKD can lead to better outcomes. These are:

- Failure of prevention – while there is work being done on diabetes and cardiovascular disease prevention there is little being done on prevention education for CKD as part of that picture. Therefore promote prevention.
- Failure of screening - too little, too late. Do screening tests every year, starting at age 40 or if symptomatic.
- Failure to use non-drug therapies for early-stage CKD - if implemented sooner high force therapies can be avoided.
- Failure by applying low-protein mantra or no dietary approach - use appropriate diet to address the causes of early stage CKD.
- All of these can be addressed easily – there is no reason these things should exist as there are effective alternatives.⁵⁴

For the practitioner who is watching out for early markers and observing their patient, early diagnosis is paramount and there are plenty of overt warning signs that signal a patient is already exhibiting

some renal impairment, or is at risk, and needs a conversation to mitigate those risks (i.e. rising fasting creatinine levels over time in context). By recognising the warning signs early, patients can be engaged in preventive conversations with all the associated health professionals to start harm minimisation. Patients are more likely to have a positive outcome if this happens and they are advised on the basic processes of risk reduction which include maintain a healthy weight, exercising and drinking adequate water, reducing alcohol intake and getting blood pressure down.⁵⁵

The most important tool naturopaths and herbalists have for prevention of CKD is the recognition and treatment of the causative factors such as hypertension or diabetes (see individual Naturopath Guides for Hypertension and Type 2 Diabetes). Therefore, most naturopaths and herbalists will aim to be treating people in stage 1 and 2 kidney disease and comanaging patients in a holistic manner with the patient's urologist/nephrologist, general practitioner, dietician and other members of their health management team. Once a person has been diagnosed with CKD they generally have less than 30% of nephron function left. At this stage practitioners can attempt to slow or prevent the disease's progress and prolong kidney function as long as possible, as well as treat life-threatening or irritating symptoms which are a part of the disease process.⁵⁶

The key is finding out what is really going on, by being confident in interpreting blood and urine test results, and additional tests are often needed. Sometimes this may require a kidney ultrasound to be performed and in many cases a kidney biopsy as well. These additional tests can help determine the underlying causes of disease, particularly autoimmune diseases (glomerulonephritis of various types), polycystic kidney disease, kidney tumors or chronic/recurrent infections. Even patients with known, long-standing diabetes or hypertension (both well-established and common causes of CKD) are not simply assumed to have CKD due to these conditions, but proven so by ruling out other possible causes and assessing the features of the kidney damage going on. Other testing is often undertaken, depending on what is found, to find the causes. For example many patients with IgA

nephropathy, and other types of glomerulonephritis, have leaky gut which needs to be addressed if the CKD has any hope of being slowed or reversed.⁵⁷

Once a more accurate picture has been obtained then herbal and nutritional medicine has much to offer in terms of slowing the disease process, providing tissue support and decreasing or halting the rate of decline. Everyone's case is different and there is no perfect guarantee of results. Herbal protocols are personalised and fine-tuned according to the specific clinical picture and every effort is made to achieve success. Numerous patients have been known to avoid the need for dialysis by following a customised naturopathic treatment plan. While these general strategies offer a good starting point there are a range of different presentations with diverse drivers. Everyone's health needs are unique, so what works for one patient does not necessarily work for another, and a personalised approach is often more effective particularly where a diagnosis of CKD is already present. The holistic treatment of CKD therefore requires an individualised approach that works alongside the person meeting them wherever they are at. This means going back to the naturopathic principle of treat the whole person (*Tolle Totum*). Practitioners can offer tailored advice on how to protect the kidneys and enhance the body's natural ability to detoxify. Treatment plans will consider the specific health conditions, lifestyle and goals, ensuring the best possible support for their patient's long-term well-being. Dietary modification is often the primary intervention and key to the treatment program.^{58 59 60}

Many of the significant kidney tonics are from the practice of traditional Chinese medicine (TCM) which also have the most evidence. In TCM the kidney organ-meridian system is regarded as the powerhouse of the body and is one of the most important energy systems. In TCM the kidneys do more than regulate the body's fluids, they also keep the opposing forces of yin and yang in balance and store the life force energy known as jing, which declines as we get older. Developing an understanding of TCM helps to identify dysfunctional kidney patterns.⁶¹

In his own clinical practice leading Australian kidney expert naturopath Adrian Harper says he has found

the main ways naturopathic medicine can help patients with CKD, include:

“Early-Stage Kidney Disease: This is a particularly good point to start supporting kidney and general health with naturopathic medicine by improving or maintaining kidney function and protecting the kidneys in the long-term to prevent kidney function decline. The focus is on maintaining the level of function by identifying and addressing any underlying drivers of disease (such as inflammation, toxin exposure, poor metabolic or gut health), supporting kidney function, protecting the kidneys through diet and nutritional and herbal medicine, and addressing any co-existing health issues that may be impacting on the kidneys. Generally these types of interventions will need to be life-long to ensure kidney health is maintained.

Late-Stage Kidney Disease: Improving or maintaining kidney function, delaying need for dialysis or transplant, and addressing any symptoms that commonly start to arise at this stage of disease.

Dialysis (Haemo and Peritoneal): Improving dialysis response through individualised diet and nutrition, resolving commonly occurring symptoms such as fatigue, brain fog, low libido, digestive issues, muscle cramps, restless legs, and skin issues, managing fluid balance, maintaining residual renal function, supporting AV fistula health and reducing risk of complications such as blood clots and high blood pressure. There are a number of complementary medicine approaches to help preserve residual renal function. Natural therapies may also help to reduce the required amount of dialysis treatment or allow more flexible eating by improving potassium and/or fluid balance.

Transplant: Optimising health prior to transplant to ensure best outcomes, diet and nutrition for post-transplant recovery, minimising side effects associated with transplant medications through diet and lifestyle approaches, support for live transplant donors prior to surgery, recovery and for maintaining function long-term with one kidney. Harper warns that while there are a number of evidence-based natural medicine approaches to support patients undergoing kidney transplant there are also a large number of supplements (and also foods) that can negatively interact with immunosuppressant

medications and cause organ rejection.”⁶²

The naturopathic treatment of CKD aims to:

- Improve gut health/microbiome/bowel transit time. Constipation is associated with higher mortality in patients with CKD.⁶³
- Reduce waist measurement/abdominal fat with appropriate diet and exercise, address and correct metabolic imbalance
- Improve liver function
- Support lymphatic system
- Maintain a healthy blood pressure
- Control blood sugar if there is diabetes
- Control high cholesterol
- Decrease or eradicate inflammation and oxidative stress
- Support blood vessel integrity
- Decrease work load on the kidney
- Treat urinary tract infections (UTIs) promptly (see The Naturopath's Guide to Urinary Tract Infections)
- Improve stress response with adequate sleep quality
- Maintain energy

Diet

Nutrition is a key intervention in CKD, especially in late stage for quality of life and day to day symptoms.

According to Harper, targeted dietary plans play a huge role in creating and maintaining whole-person health within the context of CKD and its orthodox treatment. “In supporting CKD, an individualised approach to diet is essential, as specific dietary requirements will differ between type of kidney disease, stages of kidney disease, pathology and electrolytes.” He says the standard “kidney diet” recommendations will not be appropriate for individual situations. It is also common for there to be a lack of guidance around diet and nutrition from medical specialists. The benefit of an individualised dietary plan includes improving or slowing the decline of kidney function, plus enhancing general wellbeing and reducing symptoms associated with CKD.⁶⁴

Understanding the gut-kidney axis, and recognising the impact of intestinal hyperpermeability, is crucial for CKD management. By prioritising gut health with a practitioner who can provide safe guidance through functional medicine approaches, individuals with CKD can take proactive steps toward preserving kidney function and improving their quality of life. This guide will not go into detail on individual dietary intervention however encouraging a clean, wholefoods, alkaline, plant-based diet that optimises nutritional intake and eliminates irritant and toxic substances is generally recommended.

A chronic high dietary acid load puts a burden on the kidneys. The more damaged they become the more acidic the system becomes because it is failing to eliminate it. If the high dietary acid load goes unchecked this can contribute to bone and muscle loss. Dietary acidosis is a risk factor and a compounding issue. Once a patient has mild kidney impairment a high acid diet will perpetuate that. Early studies suggest that lowering the dietary acid load can improve subclinical acidosis, preserve bone and muscle and slow decline of glomerular filtration rate.⁶⁵

Include:

To maintain a healthy weight: Include alkaline foods such as fruit and vegetables. Some lean meat, such as chicken and fish, at least once a week, depending on CKD stage. Add flavour to meals by using things like lemon or lime juice, onion, garlic, chilli, pepper, herbs and spices instead of salt. Healthy snack alternatives include fresh fruit, yoghurt (check for added sugar) and unsalted nuts. A healthy BMI for an adult is between 18.5 and 24.9. Having a BMI of 25 or greater increases the risk of developing CKD, diabetes and high blood pressure. A BMI calculator and more information can be found online at <http://healthdirect.gov.au/bmi-calculator>. Extreme (fad) diets with very little food or those that exclude whole food groups are not recommended for maintaining a healthy body weight. It also requires checking food labels, controlling portion sizes and consulting with a practitioner experienced in renal nutrition for individualised guidance and support.

Low protein diet: Vegetarian protein sources put less of a burden on the kidneys. Include tofu and tempeh as there is evidence to suggest phytoestrogens have a protective effect on the kidneys. Keep the acid forming to 20% and the

remaining alkaline. Reducing the level of protein can be challenging. In dialysis the protein will need to be increased as protein is lost with dialysis. Phosphorus rich foods should be avoided and can make it challenging from a compliance perspective.

Microvascular phytonutrient diet: It is recommended to boost dietary intake of green leafy vegetables, cacao, berries, freshly crushed raw garlic, herbs and spices such as green tea, turmeric and ginger.

Fibre-rich diet: A diet high in fibre can help bind and eliminate toxins from the body. Soluble fibre from sources like flaxseeds, chia seeds and psyllium husk may be particularly helpful for supporting digestive health and the body's detoxification process.

Probiotics and prebiotics: Encourage the growth of good bacteria to help with clearance and detoxification of uremic products via the bowel. There is emerging evidence that a healthy gut microbiome plays a role in filtering and processing environmental toxins. Probiotic-rich foods like kefir, sauerkraut and yoghurt, or a high-quality probiotic supplement, may offer additional support for reducing toxic burden.

Stay hydrated: Staying well hydrated with filtered water is critical for helping the kidneys flush out toxins. As kidney disease progresses, fluid may build up in the body which can cause swollen ankles, hands or stomach, breathlessness and high blood pressure. At this stage patients may need to limit the amount of fluid they drink or have in their food each day. Qualified professionals can advise if there is a need to reduce fluid intake.

Avoid:

Acid foods: In particular red meat, poultry, fish and grains. Try to keep the acid-forming foods to about 20% of the meal and the remaining alkaline foods.

Limit protein intake: Protein builds, repairs and maintains the body tissues and fights infections. It is found in meat, fish, grains and dairy products. When the body breaks down protein, a waste called urea is formed. As the kidneys fail, urea can build up in the blood and cause side effects like tiredness, nausea, headaches and a bad taste in the mouth. Too much protein can make the kidneys work harder, which can cause them to wear out faster. A protein-restricted diet can help limit metabolic disturbances that are characteristic of advanced CKD. Limiting

protein and eating more plant-based foods may help slow the loss of kidney function. The recommended amount of protein depends on several factors including the stage of kidney disease, weight, urine protein results, diabetes and nutritional status.

Phosphorus: This is an important mineral for the body but too much of it can be harmful, especially for people with CKD who have impaired kidney function and cannot regulate the phosphorus level in the blood. A lower phosphorus diet can help people with CKD manage their phosphorus intake and improve their kidney function and overall health outcomes, even in the early stages of the disease. This involves avoiding or limiting foods that contain phosphate additives, moderating the consumption of animal-derived foods and choosing plant-based sources of phosphorus.

Potassium: This mineral is found in many foods which help the nerves and muscles work. Healthy kidneys remove extra potassium from the blood. If the kidneys are damaged, the potassium level can rise and affect the heartbeat.

Alcohol: Excessive alcohol intake can lead to heart disease and high blood pressure, increasing the risk of CKD. Limit alcohol to less than two standard drinks per day. Ask for ice with drinks so when the ice melts it will water down the alcohol. Have a glass

of water after each alcoholic drink.

Snack and takeaway foods: Processed foods and those with high levels of saturated fat, sugar or salt. Limit take-away and fast food meals as an occasional treat.

Lifestyle

Sleep

Prioritise sleep. Aim for seven to nine hours per night.

Reduce stress

It is normal to feel different emotions at different stages of CKD. Some emotions might be disbelief, grief, frustration, despair, fear, lack of control and even depression. Talking with a friend, relative or health professional may help. Energy work such as Qi Gong can be helpful, as well as massage. For dialysis, inhaling lavender oil before needle insertion has helped the pain.

Exercise regularly

Activity should be regulated according to the patient's energy, health and wellbeing. Physical activity can help to reduce and maintain a healthy weight. It can also reduce the risk of developing CKD, heart disease and diabetes. To reap the benefits, 30 minutes on at least five days of the week is recommended.

Potential Treatment Plans

CKD	Astragalus	Codonopsis	Cordyceps	Gotu Kola	Rhubarb
CKD with diabetes	Astragalus	Codonopsis	Cordyceps	Reishi	Green Tea
CKD with hypertension	Green Tea	Hawthorn	Rehmannia	Reishi	Ginkgo
CKD with leaky gut	Perilla	St Mary's Thistle	Gotu Kola	Reishi	Green Tea

Environment

Avoidance of exposure to environmental toxins should be encouraged to protect renal function and reduce the burden of clearance. Supporting the body's detoxification pathways, particularly the liver and kidneys, can help reduce the toxic load. Detoxification protocols might involve sauna therapy or dry brushing to encourage lymphatic drainage. To reduce exposure to environmental toxins quit smoking, vaping and recreational drug use and avoid passive smoking, filter tap water by investing in a high-quality water filter. Avoid single-use plastics

and opt instead for reusable materials like glass, stainless steel or natural fibres when shopping for bottles, bags and food containers. Choose natural fibres instead of synthetic clothing. Try wearing clothes made from natural materials like cotton, wool or hemp. Minimise processed foods packaged and processed in plastic. Opt for organic, fresh, whole foods whenever possible. Ventilate the home: and vacuum regularly. Healthy swap conventional personal care products, makeup and cleaning and household products to non-toxic alternatives.⁶⁶



Rehmannia
(*Rehmannia glutinosa*)

Desired Herbal Actions and Potential Herbs Include:

CAUTION: Be cautious about strong antimicrobial herbs that may drive up inflammation. Diuretics can put more pressure on the kidneys, and their use may be inappropriate and contraindicated in renal failure and diabetes. However, in the right context they can be used including buchu for infection, hydrangea, gravel root and dandelion leaf. Nootropics can be added if cognitive issues are apparent and sedatives if there are sleep issues.

Adaptogen

These herbs non-specifically improve resistance to stressors, such as a chronic disease like CKD, through multiple mechanisms in the nervous, endocrine and immune systems. They can be especially useful during dialysis to help with blood formation and fatigue. Herbs such astragalus, codonopsis, cordyceps, dong quai, gotu kola, Korean ginseng, rehmannia, reishi, schizandra, Siberian ginseng.

Antihypertensive, antidiabetic

Hypertension is common in CKD patients and is both a cause and effect of the disease. When the kidneys cannot remove extra fluid and waste from the body, the blood vessels can become overloaded with fluid, which can raise blood pressure and lead to kidney failure. Lowering blood pressure can slow the progression of kidney disease. Antidiabetic herbs can help lower blood sugar to protect the kidneys by preventing damage to their blood vessels. Antidiabetic herbs can help improve blood pressure, body weight and reduce the risk of cardiovascular disease. Herbs such as arjuna, cinnamon, garlic, gotu kola, hawthorn, Korean ginseng, motherwort, nigella, olive leaves, perilla, reishi.

Antioxidants, anti-inflammatories, antifibrotic

The progression of CKD is heavily influenced by inflammation and oxidative stress. Inflammation is the immune system's defensive response to tissue damage or infection, whilst oxidative stress occurs due to an imbalance between reactive oxygen

species (ROS) generation and the body's antioxidant mechanisms. By reducing inflammation and oxidative stress it may be possible to mitigate the development and progression of CKD. Many plants and their extracts are known to ameliorate kidney dysfunction through their antioxidant action, with subsequent benefits on inflammation and fibrosis. Nitric oxide is an unstable molecule that degrades quickly in the bloodstream, so it must be constantly replenished. One way to increase its stability and limit its breakdown is by consuming antioxidants. Antioxidants are molecules that neutralise free radicals, which contribute to the short life of nitric oxide. Herbs such as arjuna, astragalus, bilberry, bupleurum, codonopsis, cordyceps, cinnamon, dong quai, fenugreek, ginkgo, ginger, gotu kola, garlic, green tea, hawthorn, horsechestnut, Korean ginseng, maritime pine, motherwort, nigella, oak bark, olive leaves, perilla, rehmannia, reishi, rhubarb, St Mary's thistle, schizandra, turmeric.

Nephroprotective, kidney tonic

Support kidney health by promoting detoxification, reducing inflammation and boosting the kidneys' natural filtration function. Protect the nephrons from the assaults of heavy metals and various toxins and protect and promote partial repair of the nephrons. Herbs such as astragalus, bupleurum, codonopsis, cordyceps, gotu kola, green tea, hawthorn, liquorice (monitor blood pressure and potassium), rehmannia, reishi, rhubarb, St Mary's thistle, schizandra, turmeric.

Immunomodulators

Numerous reviews have been published on the various immunological activities which are of interest to reduce autoimmune glomerulonephritis in patients where this is the cause of their CKD, and to counteract the immunosuppression common in CKD and particularly in dialysis patients. Herbs such as astragalus, cinnamon, codonopsis, cordyceps, dong quai, garlic, ginger, gotu kola, Korean ginseng, liquorice (monitor blood pressure and potassium), nigella, perilla, rehmannia, reishi, schizandra, Siberian ginseng.

Herbal Support Could Include:

HERB NAME	DESCRIPTION	ACTIONS
Astragalus (<i>Astragalus membranaceus</i>) 	Several clinical trials have reported that astragalus significantly improved CKD by decreasing proteinuria (excess protein in the urine), with a corresponding increase in creatinine clearance, and haemoglobin levels. Astragalus has a strong reputation in TCM for providing support for the kidneys in oedema and proteinuria from chronic nephritis. In the clinical practice of TCM, astragalus is mainly used to invigorate Qi and acts as a diuretic when the kidneys are weak. Studies also show astragalus is useful for CKD where it is thought to increase renal blood flow and assists with anaemia. Combined with dong quai (<i>Angelica polymorpha</i>) it is antifibrotic. The recommended dose of a 1:2 is 3-5mL TDS. Numerous clinical trials support that astragalus is beneficial in patients with diabetic nephropathy for preventing progression as well as raising serum albumin levels. Astragalus has been shown as safe and effective for improving immune function in patients on maintenance hemodialysis in a preliminary trial.^{68 69}	Adaptogen Antifibrotic Antihypertensive Anti-inflammatory Antioxidant Immunomodulator Kidney Tonic Nephroprotective
Codonopsis (<i>Codonopsis pilosula</i>) 	Known as poor man's ginseng, codonopsis has a very strong traditional use and is very safe like cordyceps. It is commonly used in TCM for diabetic nephropathy. The recommended dose for a 1:2 is 3-5mL TDS.⁷⁰	Adaptogen Antidiabetic Antihypertensive Anti-inflammatory Immunomodulator Kidney Tonic Nephroprotective

Herbal Support Could Include: (Cont.)

HERB NAME	DESCRIPTION	ACTIONS
Cordyceps (<i>Cordyceps militaris</i>) 	Cordyceps is a traditional Tibetan and Chinese herb revered as a kidney tonic. Many clinical trials have been conducted using cordyceps in CKD patients. A Cochrane review found that cordyceps, as an adjuvant therapy to conventional medicine, showed potential promise to decrease serum creatinine, increase creatine clearance, reduce proteinuria and alleviate CKD-associated complications, such as increased haemoglobin and serum albumin. One study has shown that cordyceps may help treat renal fibrosis. In one large-scale study, cordyceps lowered creatinine levels in people with CKD, and in others it protected the kidneys from toxic drugs, complications of diabetes and transplant rejection. A benefit on immune function and kidney function in CKD patients was shown in one open study using 3g to 5g whole cordyceps for 10 to 12 months. The dose in trials using hot water/alcohol extract was 400-1200mg TDS. Cordyceps has also been studied quite extensively as an adjunct therapy in patients who have undergone renal transplantation.^{71 72}	Adaptogen Antihypertensive Anti-inflammatory Antioxidant Immunomodulator Kidney Tonic Nephroprotective
Ginkgo (<i>Ginkgo biloba</i>) 	Diabetic nephropathy is one of the most serious complications in patients with diabetes. It is now the major leading cause of end-stage renal failure throughout the world. In China, ginkgo has been used widely as a supplement to improve albuminuria and kidney function during the early stage (characterised by microalbuminuria) of diabetic nephropathy. Although the mechanisms underlying the pathogenesis of diabetic nephropathy are not completely understood, oxidative stress and cytokines are important factors of disease progression. The principal finding of a recent systemic review is that ginkgo may be beneficial for early diabetic nephropathy by decreasing the urinary albumin excretion rate, lowering fasting blood glucose and improving kidney function and blood flow outcome measurements.⁷³	Antioxidant Anti-inflammatory

Herbal Support Could Include: (Cont.)

HERB NAME	DESCRIPTION	ACTIONS
Gotu Kola (<i>Centella asiatica</i>) 	Gotu kola may help with kidney fibrosis, which is a common final pathway of CKD. The ethanolic extract may inhibit the inflammatory process in kidney disease. It is also calming so supports insomnia and anxiety. It takes a couple of months to work.⁷⁴	Adaptogen Antifibrotic Anti-inflammatory Antioxidant Immunomodulator Nephroprotective
Green Tea (<i>Camellia sinensis</i>) 	Green tea can improve endothelial function which may reduce the risk of cardiovascular disease. Its antioxidant properties, in protection of renal injury caused by oxidative stress, have been a recent focus of scientific studies. Reactive oxygen species have been shown to be mediators of kidney injury and constituents in green tea are potent-free radical scavengers. Green tea may improve renal function in diabetic nephropathy, one of the most important microvascular complications of diabetes.^{75 76}	Antidiabetic Anti-inflammatory Antioxidant Antifibrotic Immunomodulator Nephroprotective
Hawthorn (<i>Crataegus monogyna</i>) 	Hawthorn contains constituents that have ACE inhibiting properties. Hawthorn extracts have been shown to have a tendency to lower blood pressure in patients with hypertension in double-blinded research.⁷⁷	Anti-Inflammatory Antioxidant Antihypertensive Nephroprotective
Perilla (<i>Perilla frutescens</i>) 	Perilla is a common herb in TCM for CKD, particularly in stages 3-5. It may delay kidney disease progression by improving kidney injury and oxidative stress and maintaining intestinal barrier function. It may also reduce proteinuria and modulate the inflammatory response in mesangial proliferative glomerulonephritis. It may also suppress IgA nephropathy by modulating the intestinal mucosal immune system.⁷⁸	Anti-inflammatory Antioxidant Antidiabetic Immunomodulator

Herbal Support Could Include: (Cont.)

HERB NAME	DESCRIPTION	ACTIONS
Rehmannia (<i>Rehmannia glutinosa</i>) 	Rehmannia has been widely used in Asian countries for the treatment of renal diseases. Taking rehmannia by mouth, along with the drug irbesartan (an angiotensin receptor blocker indicated for hypertension or diabetic nephropathy), may reduce the amount of protein in the urine of people with CKD. Rehmannia may slow the progression of renal function deterioration by inhibiting the expression of angiotensin II, AT1 receptor, TGF- β 1, and type IV collagen. Rehmannia may improve intestinal barrier integrity by upregulating the expression of tight junction proteins on intestinal mucosal epithelial cells and it may regulate gut microbiota and strengthen the intestinal barrier. ^{79 80 81}	Adaptogen Antihypertensive Anti-inflammatory Immunomodulator Kidney Tonic Nephroprotective
Reishi (<i>Ganoderma lucidum</i>) 	Reishi may help with proteinuria, a condition where there is protein in the urine, by reducing kidney permeability. Reishi can help restore the balance of the immune system and suppress the cytotoxicity of endothelial cells. Some herbs appear to act as ACE inhibitors and thus help preserve renal function. These include reishi which may be helpful in immunodeficiency related kidney disease. Reishi is useful when hypertension is present. At a dose of 1440 mg/day, a reishi extract was effective for lowering blood pressure in one preliminary Japanese clinical trial. A different reishi extract at a dose of 55mg TDS was superior to placebo when added to ACE inhibitor drugs in patients with hypertension not responding to drugs alone in one double-blinded trial. These trials support that reishi has therapeutic effects on humans when administered by mouth, and appears to be an ACE inhibitor. Additionally, reishi may be a nontoxic way to reduce hypertension, a well known cause of and aggravating factor for kidney disease. Reishi has demonstrated nephroprotective activity <i>in vivo</i> . ⁸²	Adaptogen Antidiabetic Antifibrotic Antihypertensive Antioxidant Anti-inflammatory Immunomodulator Nephroprotective

Herbal Support Could Include: (Cont.)

HERB NAME	DESCRIPTION	ACTIONS
Rhubarb (<i>Rheum palmatum</i>) 	Rhubarb has long been used as a kidney tonic in TCM. Several clinical trials have been conducted using rhubarb extracts in patients with CKD. In one trial involving 38 patients, 1g rhubarb per day maintained serum creatinine levels compared to rising levels seen in controls not treated with rhubarb. Rhubarb increases glomerular filtration and decreases cholesterol and triglyceride levels. Rhubarb may relieve diabetic nephropathy by improving lipid metabolism. Experimental research with an aqueous extract has shown lowered blood glucose levels. Aqueous extracts also increase urinary excretion of urea nitrogen and creatinine, probably due to increased glomerular filtration. Various preclinical models confirm that it reduces proteinuria, glomerulosclerosis and excessive renal cellular proliferation. These and many other trials support that rhubarb likely has a beneficial effect in patients with CKD both to delay progression and to augment the efficacy while decreasing adverse effects of haemodialysis. In a systemic review of 18 randomised or quasirandomised trials including 1322 patients with CKD, rhubarb showed significant positive effects on relieving symptoms, lowering serum creatinine and adjusting disturbance of lipid metabolism. In addition, in a prospective clinical trial of 151 patients with CKD, the frequency of end-stage renal failure in the rhubarb group was 52% lower than that in the ACE inhibitor group. Rhubarb can also assist with bowel clearance in constipation.⁸³	Antifibrotic Anti-inflammatory Kidney Tonic
St Mary's Thistle (<i>Silybum marianum</i>) 	Though well known for its hepatoprotective effects St Mary's thistle has similar, though less well-researched, protective effects on renal tissue and is a promising nephroprotective. <i>In vivo</i> St Mary's thistle has protected against renal damage due to a wide range of toxins and drugs and it reduces damage due to diabetic nephropathy as well as decreasing progression, in significant part thanks to enhanced function of the glutathione system. Some human clinical trials give preliminary support to the use of chemical constituents from St Mary's thistle in kidney disease.⁸⁴	Antioxidant Anti-inflammatory Antifibrotic Kidney Tonic Nephroprotective



Conclusion

Early detection is a key strategy to prevent CKD, its progression and related complications, but numerous studies show that awareness of CKD at the population level is low. Therefore, increasing knowledge and implementing sustainable solutions for early detection of CKD are public health priorities. As preventative health carers, naturopaths are in a good position to find CKD earlier to either prevent it or prevent its progression and the recommendation is that it would be prudent to assess every patient's kidney function. It is

empowering for people to know they can make changes to maintain good health. The biggest focus (particularly for dialysis patients) is looking for a level of wellness for the day to day. If energy, cognition and exercise are maintained it can make a big difference. Practitioners can be confident that naturopathic intervention can halt the decline in kidney function having a significant effect on the outcome. Kidney markers that are out of range can be reversed in the early stages to maintain stable health.⁸⁵

Resources

1. Chronic kidney disease: Australian facts. Australian Institute of Health and Welfare, Australian Government c2024 (updated 17 Jun 2024; accessed 6 Dec 2024) Available from <https://www.aihw.gov.au/reports/chronic-kidney-disease/chronic-kidney-disease/contents/summary>
2. Kidney Disease. Australian Bureau of Statistics. (updated 15 Dec 2024; accessed 11 Dec 2024). Available from <https://www.abs.gov.au/statistics/health/health-conditions-and-risks/kidney-disease/latest-release>
3. Wang Y, Feng Y, Li M, Yang M, Shi G, Xuan Z, Yin D, Xu F. Traditional Chinese Medicine in the Treatment of Chronic Kidney Diseases: Theories, Applications, and Mechanisms. *Front Pharmacol*. 2022 Jul 18;13:917975. doi: 10.3389/fphar.2022.917975. PMID: 35924053; PMCID: PMC9340222.
4. Francis A, Harhay MN, Ong ACM, Tummalapalli SL, Ortiz A, Fogo AB, Fliser D, Roy-Chaudhury P, Fontana M, Nangaku M, Wanner C, Malik C, Hradsky A, Adu D, Bavanandan S, Cusumano A, Sola L, Ulasi I, Jha V; American Society of Nephrology; European Renal Association; International Society of Nephrology. Chronic kidney disease and the global public health agenda: an international consensus. *Nat Rev Nephrol*. 2024 Jul;20(7):473-485. doi: 10.1038/s41581-024-00820-6. Epub 2024 Apr 3. PMID: 38570631.
5. Chronic kidney disease: Australian facts. Australian Institute of Health and Welfare c2024 (updated 12 Dec 2024; accessed 13 Dec 2024). Available from <https://www.aihw.gov.au/reports/chronic-kidney-disease/chronic-kidney-disease/contents/how-many-people-are-living-with-ckd>
6. Traynor S. Chronic kidney disease is on the rise, and COVID-19 is making matters worse. *Health Report ABC* c2024 (updated 3 Oct 2022; accessed 12 Dec 2024). Available from <https://www.abc.net.au/news/health/2022-10-03/chronic-kidney-disease-covid-19-dialysis-transplant-diagnosis/101490332>
7. Chade AR. Small Vessels, Big Role: Renal Microcirculation and Progression of Renal Injury. *Hypertension*. 2017 Apr;69(4):551-563. doi: 10.1161/HYPERTENSIONAHA.116.08319. Epub 2017 Feb 13. PMID: 28193706; PMCID: PMC5344725.
8. Khan MA, Kassianos AJ, Hoy WE, Alam AK, Healy HG, Gobe GC. Promoting Plant-Based Therapies for Chronic Kidney Disease. *J Evid Based Integr Med*. 2022 Jan-Dec;27:2515690X221079688. doi: 10.1177/2515690X221079688. PMID: 35243916; PMCID: PMC8902019.
9. Polkinghorne KR. Controversies in chronic kidney disease staging. *Clin Biochem Rev*. 2011 May;32(2):55-9. PMID: 21611077; PMCID: PMC3100281.
10. Arthur R. Update in Under 30 – Nutritional Interventions in Renal Impairment – Place & Potency. *Rachel Arthur Nutrition* c2024 Available from <https://rachelarthur.com.au/product/update-in-under-30-nutritional-interventions-in-renal-impairment-place-potency/>
11. Tilgner S. Urinary - Kidney support Medical Herbalism *Journal*10(3):1. Available from http://www.medherb.com/Therapeutics/Urinary_-_Kidney_Support.htm#_VPID_112
12. Tilgner S. Urinary - Kidney support Medical Herbalism *Journal*10(3):1. Available from http://www.medherb.com/Therapeutics/Urinary_-_Kidney_Support.htm#_VPID_112
13. Tilgner S. Urinary - Kidney support Medical Herbalism *Journal*10(3):1. Available from http://www.medherb.com/Therapeutics/Urinary_-_Kidney_Support.htm#_VPID_112
14. The Kidneys-A Brief Evolutionary Story. C 2024 Northeast School of Botanical Medicine (accessed 13 Dec 2024). Available from <https://7song.com/the-kidneys-a-brief-evolutionary-story/>
15. Chronic kidney disease: Australian facts. Australian Institute of Health and Welfare, Australian Government c2024 (updated 17 Jun 2024; accessed 6 Dec 2024) Available from <https://www.aihw.gov.au/reports/chronic-kidney-disease/chronic-kidney-disease/contents/summary>
16. Khan MA, Kassianos AJ, Hoy WE, Alam AK, Healy HG, Gobe GC. Promoting Plant-Based Therapies for Chronic Kidney Disease. *J Evid Based Integr Med*. 2022 Jan-Dec;27:2515690X221079688. doi: 10.1177/2515690X221079688. PMID: 35243916; PMCID: PMC8902019.
17. Yarnell E. Prevention and Treatment of Chronic Kidney Disorders – Dialysis and Transplant. *Practitioner Course*. Health Masters Live. Masters Media c2012-2024. (accessed 6 Dec 2024). Available from <https://healthmasters.live/course/prevention-and-treatment-of-chronic-kidney-disorders>
18. Chade AR. Small Vessels, Big Role: Renal Microcirculation and Progression of Renal Injury. *Hypertension*. 2017 Apr;69(4):551-563. doi: 10.1161/HYPERTENSIONAHA.116.08319. Epub 2017 Feb 13. PMID: 28193706; PMCID: PMC5344725.
19. Katella K. Why Is Chronic Kidney Disease (CKD) on the Rise? 6 Things to Know. *Yale Medicine* c2024 (updated 24 April 2024; accessed 10 Dec 2024) Available from <https://www.yalemedicine.org/news/why-is-chronic-kidney-disease-ckd-on-the-rise>
20. Chade AR. Small Vessels, Big Role: Renal Microcirculation and Progression of Renal Injury. *Hypertension*. 2017 Apr;69(4):551-563. doi: 10.1161/HYPERTENSIONAHA.116.08319. Epub 2017 Feb 13. PMID: 28193706; PMCID: PMC5344725.
21. Chronic kidney disease. *Healthdirect Australia Limited* c2024 (accessed 16 Dec 2024). Available from <https://www.healthdirect.gov.au/chronic-kidney-disease>
22. Chronic Kidney Disease in the United States, 2023 U.S Centers for Disease Control and Prevention (updated 15 May 2024; accessed 11 Dec 2024). Available from <https://www.cdc.gov/kidney-disease/php/data-research/index.html>
23. Zhang J, Thio CHL, Gansevoort RT, Snieder H. Familial Aggregation of CKD and Heritability of Kidney Biomarkers in the General Population: The Lifelines Cohort Study. *Am J Kidney Dis*. 2021 Jun;77(6):869-878. doi: 10.1053/j.ajkd.2020.11.012. Epub 2020 Dec 22. PMID: 33359149.
24. Chronic kidney disease in Aboriginal and Torres Strait Islander people. Australian Institute of Health and Welfare c2024 (updated 16 Sep 2011; accessed 17 Dec 2024). Available from <https://www.aihw.gov.au/reports/chronic-kidney-disease/chronic-kidney-disease-indigenous-australians/summary>
25. What Is Chronic Kidney Disease? National Institute of Diabetes and Digestive and Kidney Diseases. U.S. Department of Health and Human Services National Institutes of Health. (accessed 16 Dec 2024). Available from <https://www.niddk.nih.gov/health-information/kidney-disease/chronic-kidney-disease-ckd/what-is-chronic-kidney-disease>
26. Chronic Kidney Disease. U.S Centers for Disease Control and Prevention (updated 15 May 2024; accessed 12 Dec 2024). Available from <https://www.cdc.gov/diabetes/diabetes-complications/diabetes-and-chronic-kidney-disease.html>
27. Chronic kidney disease: Australian facts. Australian Institute of

Resources (Cont.)

- Health and Welfare c2024 (updated 12 Dec 2024; accessed 13 Dec 2024). Available from <https://www.aihw.gov.au/reports/chronic-kidney-disease/chronic-kidney-disease/contents/how-many-people-are-living-with-ckd>
28. Prasad R, Jha RK, Keerti A. Chronic Kidney Disease: Its Relationship With Obesity. *Cureus*. 2022 Oct 21;14(10):e30535. doi: 10.7759/cureus.30535. PMID: 36415443; PMCID: PMC9675899.
 29. What Is Chronic Kidney Disease? National Institute of Diabetes and Digestive and Kidney Diseases. U.S. Department of Health and Human Services National Institutes of Health. (accessed 16 Dec 2024). Available from <https://www.niddk.nih.gov/health-information/kidney-disease/chronic-kidney-disease-ckd/what-is-chronic-kidney-disease>
 30. Hsu RK, Hsu CY. The Role of Acute Kidney Injury in Chronic Kidney Disease. *Semin Nephrol*. 2016 Jul;36(4):283-92. doi: 10.1016/j.semnephrol.2016.05.005. PMID: 27475659; PMCID: PMC4979984.
 31. What Is Polycystic Kidney Disease? National Institute of Diabetes and Digestive and Kidney Diseases. U.S. Department of Health and Human Services National Institutes of Health. (accessed 5 Dec 2024). Available from <https://www.niddk.nih.gov/health-information/kidney-disease/polycystic-kidney-disease/what-is-pkd>
 32. Kouidi E, Hanssen H, Anding-Rost K, Cupisti A, Deligiannis A, Grupp C, Koufaki P, Leeson P, Segura-Orti E, Van Craenenbroeck A, Van Craenenbroeck E, Clyne N, Halle M. The role of exercise training on cardiovascular risk factors and heart disease in patients with chronic kidney disease G3-G5 and G5D: a Clinical Consensus Statement of the European Association of Preventive Cardiology of the ESC and the European Association of Rehabilitation in Chronic Kidney Disease. *Eur J Prev Cardiol*. 2024 Sep 6;31(12):1493-1515. doi: 10.1093/eurjpc/zwae130. PMID: 38593202.
 33. He LQ, Wu XH, Huang YQ, Zhang XY, Shu L. Dietary patterns and chronic kidney disease risk: a systematic review and updated meta-analysis of observational studies. *Nutr J*. 2021 Jan 8;20(1):4. doi: 10.1186/s12937-020-00661-6. PMID: 33419440; PMCID: PMC7796538.
 34. Kramer H. Diet and Chronic Kidney Disease. *Adv Nutr*. 2019 Nov 1;10(Suppl_4):S367-S379. doi: 10.1093/advances/nmz011. PMID: 31728497; PMCID: PMC6855949.
 35. Avesani CM, Cuppari L, Nerbass FB, Lindholm B, Stenvinkel P. Ultraprocessed foods and chronic kidney disease-double trouble. *Clin Kidney J*. 2023 May 4;16(11):1723-1736. doi: 10.1093/ckj/sfad103. PMID: 37915903; PMCID: PMC10616474.
 36. Harper A. The Gut Microbiome and Chronic Kidney Disease: A Vital Connection. *Adrian Harper Naturopathy* (updated 8 Jan 2024; accessed 20 Dec 2024). Available from <https://www.adrianharper.com.au/blog/gut-microbiome-ckd>
 37. Yacoub R, Habib H, Lahdo A, Al Ali R, Varjabedian L, Atalla G, Kassis Akl N, Aldakheel S, Alahdab S, Albitar S. Association between smoking and chronic kidney disease: a case control study. *BMC Public Health*. 2010 Nov 25;10:731. doi: 10.1186/1471-2458-10-731. PMID: 21108832; PMCID: PMC3004836.
 38. Lo JA, Kim JS, Jo MJ, Cho EJ, Ahn SY, Ko GJ, Kwon YJ, Kim JE. Impact of water consumption on renal function in the general population: a cross-sectional analysis of KNHANES data (2008-2017). *Clin Exp Nephrol*. 2021 Apr;25(4):376-384. doi: 10.1007/s10157-020-01997-3. Epub 2021 Jan 4. PMID: 33398596; PMCID: PMC7966133.
 39. Harper A. The Impact of Microplastics on Gut Health: An Emerging Concern. *Adrian Harper Naturopathy* (updated 9 Jun 2024; accessed 20 Dec 2024). Available from <https://www.adrianharper.com.au/blog/7tih20ev37qsdv2ynh23eccimfqs2j>
 40. Baylis C. Nitric oxide deficiency in chronic kidney disease. *Am J Physiol Renal Physiol*. 2008 Jan;294(1):F1-9. doi: 10.1152/ajprenal.00424.2007. Epub 2007 Oct 10. PMID: 17928410.
 41. Chronic kidney disease: Australian facts. Australian Institute of Health and Welfare, Australian Government c2024 (updated 17 Jun 2024; accessed 6 Dec 2024) Available from <https://www.aihw.gov.au/reports/chronic-kidney-disease/chronic-kidney-disease/contents/summary>
 42. Chronic kidney disease: Australian facts. Australian Institute of Health and Welfare, Australian Government c2024 (updated 17 Jun 2024; accessed 6 Dec 2024) Available from <https://www.aihw.gov.au/reports/chronic-kidney-disease/chronic-kidney-disease/contents/summary>
 43. Chronic kidney disease: Australian facts. Australian Institute of Health and Welfare, Australian Government c2024 (updated 17 Jun 2024; accessed 6 Dec 2024) Available from <https://www.aihw.gov.au/reports/chronic-kidney-disease/chronic-kidney-disease/contents/summary>
 44. Phoon RKS. Chronic kidney disease in the elderly Assessment and management. *Australian Family Physician*. December 2012;41(12)
 45. Chronic Kidney Disease. c2024 Healthdirect Australia Limited. (updated May 2023; accessed 18 Dec 2024). Available from <https://www.healthdirect.gov.au/chronic-kidney-disease>
 46. Treatment and management of chronic kidney disease. Web report, part of Australian Centre for Monitoring Population Health (updated 12 Dec 2024; accessed 17 Dec 2024). Available from <https://www.aihw.gov.au/reports/chronic-kidney-disease/chronic-kidney-disease/contents/treatment-and-management-of-chronic-kidney-disease?request=smoothstate>
 47. An Introduction to Kidney Treatment Options. *Kidney Health Australia*. (updated 2020; accessed 17 Dec 2024). Available from <https://assets.kidney.org.au/resources/KHA-Booklet-An-Introduction-to-Kidney-Disease-Treatment-Options.pdf>
 48. Harper A. Kidney Disease. *Adrian Harper Naturopathy*. (accessed 18 Dec 2024). Available from <https://www.adrianharper.com.au/areas-of-practice-1-1>
 49. Hechtman L. *Clinical Naturopathy Medicine*. Churchill Livingstone Elsevier:Sydney. p.727
 50. Whitfield-Cook A. Wellness by Designs Podcast: Natural Management of CKD – With Adrian Harper. (accessed 6 Dec 2024). Available from <https://designsforhealth.com.au/natural-management-of-chronic-kidney-disease-with-adrian-harper/>
 51. Harper A. Kidney Disease. *Adrian Harper Naturopathy*. (accessed 18 Dec 2024). Available from <https://www.adrianharper.com.au/areas-of-practice-1-1>
 52. Yarnell E. Prevention and Treatment of Chronic Kidney

Resources (Cont.)

- Disorders – Dialysis and Transplant. Practitioner Course. Health Masters Live. Masters Media c2012-2024. (accessed 6 Dec 2024). Available from <https://healthmasters.live/course/prevention-and-treatment-of-chronic-kidney-disorders>
53. Arthur R. Nutritional Interventions in Renal Impairment – Place & Potency. Rachel Arthur Nutrition. (accessed 4 Dec 2024). c2024 Available from <https://rachelarthur.com.au/content/nutritional-interventions-in-renal-impairment-place-potency/>
 54. Yarnell E. Prevention and Treatment of Chronic Kidney Disorders – Dialysis and Transplant. Practitioner Course. Health Masters Live. Masters Media c2012-2024. (accessed 6 Dec 2024). Available from <https://healthmasters.live/course/prevention-and-treatment-of-chronic-kidney-disorders>
 55. Arthur R. Nutritional Interventions in Renal Impairment – Place & Potency. Rachel Arthur Nutrition. (accessed 4 Dec 2024). c2024 Available from <https://rachelarthur.com.au/content/nutritional-interventions-in-renal-impairment-place-potency/>
 56. Yarnell E. Prevention and Treatment of Chronic Kidney Disorders – Dialysis and Transplant. Practitioner Course. Health Masters Live. Masters Media c2012-2024. (accessed 6 Dec 2024). Available from <https://healthmasters.live/course/prevention-and-treatment-of-chronic-kidney-disorders>
 57. Harper A. The Impact of Microplastics on Gut Health: An Emerging Concern. Adrian Harper Naturopathy (updated 9 Jun 2024; accessed 20 Dec 2024). Available from <https://www.adrianharper.com.au/blog/7tih20ev37qsdv2ynh23eccimfqs2j>
 58. Harper A. The Impact of Microplastics on Gut Health: An Emerging Concern. Adrian Harper Naturopathy (updated 9 Jun 2024; accessed 20 Dec 2024). Available from <https://www.adrianharper.com.au/blog/7tih20ev37qsdv2ynh23eccimfqs2j>
 59. <http://www.urologynd.com/blog/chronic-kidney-disease-find-the-cause-dont-just-wait-for-dialysis>
 60. Khan MA, Kassianos AJ, Hoy WE, Alam AK, Healy HG, Gobe GC. Promoting Plant-Based Therapies for Chronic Kidney Disease. *J Evid Based Integr Med.* 2022 Jan-Dec;27:2515690X221079688. doi: 10.1177/2515690X221079688. PMID: 35243916; PMCID: PMC8902019.
 61. Wang Y, Feng Y, Li M, Yang M, Shi G, Xuan Z, Yin D, Xu F. Traditional Chinese Medicine in the Treatment of Chronic Kidney Diseases: Theories, Applications, and Mechanisms. *Front Pharmacol.* 2022 Jul 18;13:917975. doi: 10.3389/fphar.2022.917975. PMID: 35924053; PMCID: PMC9340222.
 62. Harper A. Kidney Disease. Adrian Harper Naturopathy. (accessed 18 Dec 2024). Available from <https://www.adrianharper.com.au/areas-of-practice-1-1>
 63. Cha RR, Park SY, Camilleri M; Constipation Research Group of Korean Society of Neurogastroenterology and Motility. Constipation in Patients With Chronic Kidney Disease. *J Neurogastroenterol Motil.* 2023 Oct 30;29(4):428-435. doi: 10.5056/jnm23133. PMID: 37814433; PMCID: PMC10577456.
 64. Harper A. Kidney Disease. Adrian Harper Naturopathy. (accessed 18 Dec 2024). Available from <https://www.adrianharper.com.au/areas-of-practice-1-1>
 65. Scialla JJ, Anderson CA. Dietary acid load: a novel nutritional target in chronic kidney disease? *Adv Chronic Kidney Dis.* 2013 Mar;20(2):141-9. doi: 10.1053/j.ackd.2012.11.001. PMID: 23439373; PMCID: PMC3604792.
 66. Harper A. The Impact of Microplastics on Gut Health: An Emerging Concern. Adrian Harper Naturopathy (updated 9 Jun 2024; accessed 20 Dec 2024). Available from <https://www.adrianharper.com.au/blog/7tih20ev37qsdv2ynh23eccimfqs2j>
 67. Yarnell E. Botanical Medicines Used for Kidney Disease in the United States. *Iranian Journal of Kidney Diseases.* 2012; 6(6)
 68. Yarnell E. Botanical Medicines Used for Kidney Disease in the United States. *Iranian Journal of Kidney Diseases.* 2012; 6(6)
 69. Khan MA, Kassianos AJ, Hoy WE, Alam AK, Healy HG, Gobe GC. Promoting Plant-Based Therapies for Chronic Kidney Disease. *Journal of Evidence-Based Integrative Medicine.* 2022;27. doi:10.1177/2515690X221079688
 70. Yarnell E. Prevention and Treatment of Chronic Kidney Disorders – Dialysis and Transplant. Practitioner Course. Health Masters Live. Masters Media c2012-2024. (accessed 6 Dec 2024). Available from <https://healthmasters.live/course/prevention-and-treatment-of-chronic-kidney-disorders>
 71. Yarnell E. Botanical Medicines Used for Kidney Disease in the United States. *Iranian Journal of Kidney Diseases.* 2012; 6(6)
 72. Zhang HW, Lin ZX, Tung YS, Kwan TH, Mok CK, Leung C, Chan LS. Cordyceps sinensis (a traditional Chinese medicine) for treating chronic kidney disease. *Cochrane Database Syst Rev.* 2014 Dec 18;2014(12):CD008353. doi: 10.1002/14651858.CD008353.pub2. PMID: 25519252; PMCID: PMC10632742.
 73. Zhang L, Mao W, Guo X, Wu Y, Li C, Lu Z, Su G, Li X, Liu Z, Guo R, Jie X, Wen Z, Liu X. Ginkgo biloba Extract for Patients with Early Diabetic Nephropathy: A Systematic Review. *Evid Based Complement Alternat Med.* 2013;2013:689142. doi: 10.1155/2013/689142. Epub 2013 Feb 24. PMID: 23533513; PMCID: PMC3595672.
 74. Yarnell E. Prevention and Treatment of Chronic Kidney Disorders – Dialysis and Transplant. Practitioner Course. Health Masters Live. Masters Media c2012-2024. (accessed 6 Dec 2024). Available from <https://healthmasters.live/course/prevention-and-treatment-of-chronic-kidney-disorders>
 75. Nasri H, Ahmadi A, Baradaran A, Nasri P, Hajian S, Pour-Arian A, et al. A biochemical study on ameliorative effect of green tea (*Camellia sinensis*) extract against contrast media induced acute kidney injury. *J Renal Inj Prev.* 2013 Nov 9;3(2):47-9. doi: 10.12861/jrip.2014.16. eCollection 2014
 76. Yazdanpanah Z, Salehi-Abargouei A, Mozaffari Z, Hemayati R. The effect of green tea (*Camellia sinensis*) on lipid profiles and renal function in people with type 2 diabetes and nephropathy: a randomized controlled clinical trial. *Front Nutr.* 2023 Dec 14;10:1253275. doi: 10.3389/fnut.2023.1253275. PMID: 38162524; PMCID: PMC10755896.
 77. Yarnell E. Botanical Medicines Used for Kidney Disease in the United States. *Iranian Journal of Kidney Diseases.* 2012; 6(6)
 78. Adam G, Adam AM, Robu S, Harabor V, Harabor A, Nechita A, Marin DB, Morariu ID, Cioanca O, Vasilache IA, Hancianu M. The Effects of *Perilla frutescens* Extracts on IgA Nephropathy: A Systematic Review and Meta-Analysis. *Pharmaceuticals (Basel).* 2023 Jul 10;16(7):988. doi: 10.3390/ph16070988. PMID: 37513901; PMCID: PMC10385934.

Resources (Cont.)

79. Lee BC, Choi JB, Cho HJ, Kim YS. *Rehmannia glutinosa* ameliorates the progressive renal failure induced by 5/6 nephrectomy. *J Ethnopharmacol*. 2009 Feb 25;122(1):131-5. doi: 10.1016/j.jep.2008.12.015. Epub 2008 Dec 25.
80. Qiu H, Fu P, Fan W, Zuo C, Feng P, Shi P, Cao L, Liu F, Zhou L, Chen F, Zhong H, Gou Z, Liang Y, Shi M. Treatment of primary chronic glomerulonephritis with *Rehmannia glutinosa* acteosides in combination with the angiotensin receptor blocker irbesartan: a randomized controlled trial. *Phytother Res*. 2014 Jan;28(1):132-6. doi: 10.1002/ptr.4973. Epub 2013 Mar 21. PMID: 23519822.
81. Wang L, Zhu JH, Jiang XD, Ma ZX, Tao JH. Preventive effects of the *Rehmannia glutinosa* Libosch and *Cornus officinalis* Sieb herb couple on chronic kidney disease rats via modulating the intestinal microbiota and enhancing the intestinal barrier. *Front Pharmacol*. 2022 Sep 8;13:942032. doi: 10.3389/fphar.2022.942032. PMID: 36160423; PMCID: PMC9495080.
82. Yarnell E. Botanical Medicines Used for Kidney Disease in the United States. *Iranian Journal of Kidney Diseases*. 2012; 6(6)
83. Yarnell E. Botanical Medicines Used for Kidney Disease in the United States. *Iranian Journal of Kidney Diseases*. 2012; 6(6)
84. Yarnell E. Botanical Medicines Used for Kidney Disease in the United States. *Iranian Journal of Kidney Diseases*. 2012; 6(6)
85. Francis A, Harhay MN, Ong ACM, Tummalapalli SL, Ortiz A, Fogo AB, Fliser D, Roy-Chaudhury P, Fontana M, Nangaku M, Wanner C, Malik C, Hradsky A, Adu D, Bavanandan S, Cusumano A, Sola L, Ulasi I, Jha V; American Society of Nephrology; European Renal Association; International Society of Nephrology. Chronic kidney disease and the global public health agenda: an international consensus. *Nat Rev Nephrol*. 2024 Jul;20(7):473-485. doi: 10.1038/s41581-024-00820-6. Epub 2024 Apr 3. PMID: 38570631.

PURE PLANT
POWER



GROUNDING
IN TRADITION

Our powerful herbal healing is grounded in tradition, and we are devoted to sharing this with you.

Our practitioner-quality herbal extracts are handmade to harness the pure power of nature.

To learn more about this condition and potential remedies please contact us:

1300 443 727

pracsupport@herbalextracts.com.au



HERBALEXTRACTS.COM.AU