

## 18. What treatment is available for people with chronic kidney disease?

### A GUIDE FOR PATIENTS

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#### What treatment is available for people with chronic kidney disease?

##### What is chronic renal failure and what does it mean for me?

As outlined in section 17, **chronic renal failure** is any permanent reduction in kidney function below normal levels. Once the function of the kidneys has deteriorated to any significant degree, further loss of function occurs. Because of this, every effort should be made to prevent any further loss of function, which would otherwise lead to **uraemia** or **end-stage renal failure**. This is achieved by observing the guidelines below.

##### If my kidneys are going to fail anyway, why bother?

The presence of **chronic renal failure** does not inevitably mean there will be progression to **end-stage renal failure (and dialysis or a transplant)**. There is now studies that show the progression of kidney failure can be significantly slowed and in some cases, completely stabilised by appropriate treatment. The strongest link relates to control of high blood pressure, with additional benefits to be gained from some of the treatments detailed below.

Even in circumstances where progression to end-stage renal failure is inevitable, remaining independent of **renal replacement therapy (dialysis)** for as long as possible is a worthwhile endeavour. Furthermore, optimising a person's health prior to commencing renal replacement therapy will increase the likelihood of a successful move to dialysis or suitability for **kidney transplantation**.

##### Control of hypertension

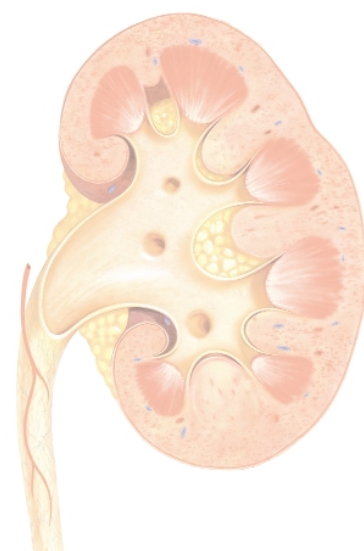
Controlling high blood pressure significantly slows the rate of deterioration of kidney function. Controlling blood pressure is of paramount importance for many reasons, not least of which is protecting the kidneys. This is not to be undertaken lightly. Adequate control of blood pressure frequently requires more than one type of medication. Remembering to take the medications requires a high level of commitment.

Target blood pressure should be less than 130/85, and about 120/70 if the cause of renal failure is diabetes mellitus. In fact, it seems the lower the blood pressure, the lower the risk of renal failure and vascular disease, which is the major cause of death in this patient population. Current medical evidence suggests that, if there is no immediate contraindication, a class of medication known as ACE inhibitors should be the first line therapy. The main aim is to have the blood pressure reduced by any means in order to transmit a low pressure to the glomerulus, thereby decreasing the risk of progressive renal failure.

#### Dietary protein restriction

A diet low in protein (**protein restricted diet**) has some benefit in people with chronic renal failure. In general, restriction of dietary protein to 0.8 g/kg body weight of protein per day is now recommended in patients with moderate deterioration in kidney function. The benefits are best seen in patients with lots of protein in their urine (**proteinuria**). Reducing protein intake below 0.8 g/kg body weight of protein per day increases the risk of malnutrition and may be harmful. All patients who develop chronic renal failure should be assessed and advised by a dietitian.

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### *Chronic kidney disease treatment continued...*

#### High cholesterol (hyperlipidaemia)

Some people with chronic renal failure are at particularly high risk of the harmful effects of high cholesterol. In such people, it is important to monitor the levels of cholesterol and fat in the blood and to initiate treatment if necessary.

Treatment consists of special dietary advice and failing this, the use of special cholesterol-lowering medication. The most commonly prescribed medications for this problem are a family of drugs called HMG Co-A reductase inhibitors (more commonly known as **statins**). These have been shown to reduce the amount of protein leaking through the kidneys (proteinuria) and to slow the progression of chronic renal failure in people with high levels of cholesterol in their blood. It is important to note that controlling high cholesterol levels is important for everybody, not just people with kidney disease.

#### High levels of phosphate in the blood (hyperphosphataemia)

Once kidney function is less than normal, an accumulation of **phosphate** in the blood occurs. There are test studies showing that lowering phosphate levels in the blood to normal levels reduces kidney damage. This occurs by decreasing the build-up of **calcium phosphate** in the kidney.

Calcium phosphate build-up in the kidney causes chronic damage and a rapid decline in kidney function.

Perhaps more importantly, higher levels of phosphate in the blood have a negative effect on calcium concentrations, function of the small glands in the neck (called the parathyroid glands) and strength of the bones.

Unless treated, this contributes to what is called kidney bone disease (**renal osteodystrophy**) with loss of calcium and loss of bone strength.

High phosphate levels in the blood can also cause severe itching of the skin (**pruritis**), which is common in people with chronic renal failure. For this reason also it is important to control the level of phosphate in the blood.

Treatment may begin with a special diet low in phosphate but most patients will need to take drugs called **phosphate binders** to help prevent the build-up of phosphate in the blood. These drugs bind phosphate, released from food in the stomach and prevent its absorption into the bloodstream.

Because of this, phosphate binders must be taken with food. The drug is not effective if taken separately from meals. The phosphate, bound to the phosphate binders, then passes through the intestine and is eliminated from the body in the bowel motions. There are numerous phosphate binders commercially available including Caltrate, Cal-Sup, Titalac, Mylanta, Alu-Tab and Gastrogel.

#### High levels of uric acid (hyperuricaemia)

To date there is no proof that lowering levels of uric acid in the blood improves the rate of decline of kidney function. However, in some patients in whom chronic renal failure is caused by high levels of uric acid (**urate nephropathy**), it is important to take measures to keep the levels low. This is achieved with a special diet (**low purine diet**) and medication called allopurinol. This is commercially available as Allohexal, Allorin, Capurate, Progout, and Zyloprim.

#### High levels of acid in the blood (acidosis)

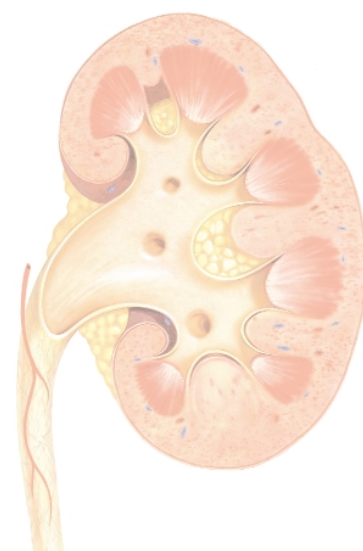
Another function of the kidneys is to maintain the level of acid in the blood within a narrow range. They do this by generating large amounts of **bicarbonate** (a base or alkali) each day, which helps maintain the body's balance of acids and bases as reflected by the **pH** of the blood.

When kidney function is reduced this production of bicarbonate may be reduced, resulting in a build-up of acid or reduction in the pH in the bloodstream. This is called **acidosis**.

As chronic renal failure progresses, the level of acid in the blood rises, affecting all cells in the body and contributing to a general feeling of being unwell. Acidosis can be bad for the bones, causing weakening and a loss of bone substance. It also suppresses appetite. In addition, a change in the relative levels of acids and bases in the blood (**acid-base balance**) can cause the level of potassium in the bloodstream to rise and this can have a harmful effect on the heart.

Treatment of this problem involves taking tablets rich in bicarbonate. These maintain a normal acid-base balance, thus protecting the bones and the heart and helping to reduce some of the workload of the kidney. Bicarbonate may be prescribed as capsules called Sodibic or as a powder dissolved in water.

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Smoking increases blood pressure and hastens the deterioration in the function of the kidneys in people with chronic renal failure.

### **Chronic kidney disease treatment continued...**

#### **Exercise**

The benefits of exercise are important for people with reduced kidney function. Exercise helps protect the heart and the blood vessels. Maintenance of a good level of fitness improves overall health. Optimising health prior to commencing renal replacement therapy increases the chance of a successful change to dialysis as well as ensuring suitability for subsequent **kidney transplantation**.

#### **Anaemia**

As mentioned previously, the kidneys produce a compound called erythropoietin (**EPO**), which helps produce red blood cells and maintain a normal blood count. With reduced kidney function, the production of erythropoietin is reduced and anaemia occurs. This may result in tiredness, lassitude, weakness and nausea, and have a harmful effect on the heart. Erythropoietin is now available in the form of injections, which correct the anaemia and help the function of the heart. These injections are given under the skin (**subcutaneously**) three times per week.

#### **Smoking**

Smoking increases blood pressure and hastens the deterioration in the function of the kidneys in people with chronic renal failure. Also, smoking causes heart disease, a serious problem faced by people who suffer from kidney disease. Heart disease is the most common health reason for people with end-stage renal failure to be unsuitable for kidney transplantation.

#### **Maintaining a high fluid intake**

Maintenance of a fluid intake in excess of 2 litres per day helps protect kidney function. A high fluid intake also helps maintain a good supply of blood to the kidneys by preventing dehydration.

#### **Other dietary factors**

A diet low in salt and low in saturated fats may help in blood pressure control and correction of high cholesterol.

### Achieve and maintain ideal body weight

Being overweight puts an extra strain on kidney function. The kidneys are the main route of removal for waste products of body metabolism.

Being overweight is often accompanied by an increase in blood pressure, blood cholesterol, blood glucose and blood uric acid concentrations (the substance that causes gout), all of which may be detrimental to the kidneys.

### Avoid excess alcohol

Besides the obvious problems associated with alcohol, excess alcohol can harm the kidney by causing a rise in blood pressure, blood cholesterol concentrations, blood glucose concentrations and blood uric acid concentrations.

### Blood glucose control

In people with kidney problems related to diabetes mellitus tight control of the blood glucose level is essential to help slow the rate of progression of the kidney disease (see also section 7). This may require a change in diet, tablets to lower blood glucose levels and sometimes insulin injections.

The benefits of exercise should be stressed to people with reduced function of their kidneys. This helps protect the heart and the blood vessels of the body.

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Many drugs can have harmful effects on the kidneys, particularly diuretics, painkillers, anti-inflammatory medications and some antibiotics. Before any new medication is taken, it is very important to check with your doctor and/or your pharmacist that it will not harm your kidneys.

### **Chronic kidney disease treatment continued...**

#### **Care with all drug therapy**

Many drugs can have harmful effects on the kidneys, particularly diuretics (water or fluid tablets), painkillers, anti-inflammatory drugs (often prescribed for painful joints or arthritis) and some antibiotics.

Before any new medication is taken, it is very important to check with your doctor and/or your pharmacist that it will not harm your kidneys.

Many of these drugs can be used if necessary, but the dose might need to be changed or the time between doses lengthened. If such drugs are used, the kidney function should be checked with a blood test soon after starting them.

#### **Treat infections if they occur**

Any infection can have a harmful effect on the kidneys. This is because infections trigger the immune system which in turn can upset the kidneys. Should any infection occur it is important to see your doctor so that you can receive treatment.

#### **Nutrition**

It is important to maintain a healthy diet. At times a diet low in protein (protein restricted diet) may be prescribed to help prevent progression of a kidney condition. If a protein restricted diet is recommended it must not be so low as to cause malnutrition. Your health can best be assessed by your doctor in consultation with a dietitian.

#### **Vitamin supplements**

With more severe kidney disease, essential vitamins may become reduced - vitamin B, vitamin C, folic acid and other supplements may be required.

### Corticosteroids and immune-suppressive drugs

Some kidney conditions improve with the use of drugs that suppress the immune system. These drugs are prescribed only when there is a good chance of improving the kidney condition. Usually, these drugs will only be prescribed after the exact type of kidney disease has been confirmed with a kidney biopsy. Side effects frequently occur with these drugs, but they can be safely used with close monitoring and assessment of any side effects. Such drugs include prednisolone (cortisone), and a variety of immune-suppressive drugs such as cyclophosphamide, azathioprine, cyclosporin A and mycophenolate.

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